

**FINAL**

# **Groundwater Characterization Report**

**King Salmon Earth Station  
State Airport Road  
King Salmon, Alaska, 99613  
AT&T GLC AK0344**

*Prepared for*

**AT&T Alascom**  
505 East Bluff Drive MP189  
Anchorage, Alaska 99501

*Prepared by*

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Anchorage, Alaska 99503

Project Number: PNG0967

November 2023

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Project Number: PNG0967

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## ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
ADOT&PF	Alaska Department of Transportation and Public Facilities
AFS	Air Force Station
AST	aboveground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
COPC	contaminants of potential concern
CSM	conceptual site model
DOT	Department of Transportation
DRO	diesel-range organics
EOS	Eos Positioning Systems
ESA	Environmental Site Assessment
Geosyntec	Geosyntec Consultants
GeoTek	GeoTek Alaska
GNSS	Global Navigation Satellite System
GRO	gasoline-range organics
IC	institutional control
IDW	investigation-derived waste
KSES	King Salmon Earth Station
LTM	long-term monitoring
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mm	millimeter
PAH	polyaromatic hydrocarbon
PAL	project action level
PFAS	per- and polyfluoroalkyl substances
PID	photoionization detector
ppm	parts per million

PVC	polyvinyl chloride
SGS	SGS North America, Inc.
TOC	top-of-casing
VOC	volatile organic compound

## EXECUTIVE SUMMARY

This document presents a groundwater characterization report prepared by Geosyntec Consultants, Inc. (Geosyntec) on behalf of AT&T Alascom for the King Salmon Earth Station (KSES) in King Salmon, Alaska (site). Impacted soil associated with the former Power Building aboveground storage tank (AST) onsite had previously been found to have concentrations of diesel range organics (DRO) that exceeded Alaska Department of Environmental Conservation (ADEC) cleanup levels. Although impacted soil was removed from the site in April and May 2023, field evidence indicated that soil contamination extended vertically to the groundwater table. Additionally, one sidewall confirmation sample from the final extent of the May 2023 excavation was marginally above the applicable DRO ADEC cleanup level (Geosyntec, 2023a).

Geosyntec performed groundwater characterization and supplemental soil characterization at KSES in July 2023 to evaluate whether former petroleum impacts in subsurface soil have impacted the underlying aquifer and to complete delineation of subsurface soil contamination.

Geosyntec installed, developed, and sampled five monitoring wells (MW-01, MW-02, MW-03, MW-04, and MW-05) to evaluate potential impacts to groundwater, which was encountered at approximately 9.5 feet below the ground surface (bgs). One soil boring (SB-04) was drilled to 8 feet bgs along the south-west margin of the site to facilitate collection of a subsurface soil sample to complete delineation of residual contaminated soil. The soil sample was submitted for DRO analysis, while the groundwater samples were submitted for petroleum volatile organic compounds (VOCs), gasoline range organics (GRO), DRO, and polycyclic aromatic hydrocarbons (PAHs) analyses.

The site characterization findings include:

- DRO soil contamination at the site has migrated to groundwater and impacted groundwater in the source area at concentrations that exceed ADEC cleanup levels.
- DRO groundwater contamination is delineated and has not migrated off site.
- The residual DRO soil contamination on the southwestern sidewall wall of the April-May 2023 excavation has now been delineated and extends less than 10 feet laterally from the April-May 2023 excavation.

## 1. INTRODUCTION AND BACKGROUND

Geosyntec Consultants, Inc. (Geosyntec) has prepared this groundwater characterization report for AT&T Alascom for the King Salmon Earth Station (KSES) former Power Building aboveground storage tank (AST) located in King Salmon, Alaska (Figure 1).

Geosyntec previously completed corrective action at the AT&T Alascom KSES former Power Building AST in April and May 2023 (Geosyntec, 2023a) that included the removal of an estimated 302 cubic yards of diesel range organics (DRO)-impacted soil. The supplemental characterization effort described in this report was performed to (1) evaluate whether former petroleum impacts in subsurface soil have impacted the underlying aquifer and (2) to complete delineation of subsurface soil contamination.

The document has been prepared by Emma Bristol, EIT, and Matt Faust, PG, both of whom are qualified environmental professionals per 18 Alaska Administrative Code (AAC) 75.333. The fieldwork was executed by Emma Bristol and Matt Faust.

### 1.1 Site Description

The AT&T Alascom KSES (site) is in King Salmon, Alaska, adjacent to the King Salmon airport (Figure 1). The telecommunications station was decommissioned, and structures were removed in 2022. The property is owned by the Alaska Department of Transportation and Public Facilities (ADOT&PF), who intends to subdivide the property into new lease lots, with the potential for construction of up to three new airplane hangars.

The property is mostly level, but slopes gently in portions south, towards the Naknek River, and covers approximately 0.8 acres (Figure 2). It is bounded to the north by King Salmon airport and to the south by Airport Road. It is unpaved and has no landscaping. Drainage of surface water from the site is allowed to infiltrate into the ground. Groundwater is present at approximately 9.5 feet below ground surface (bgs). The nearest surface water body to the site is the Naknek River, located approximately 1,200 feet southwest of the site (Figure 1).

Historically, four contiguous lots (Lots 5, 6, 7, and 8) were leased and occupied by AT&T Alascom. In approximately 2010, AT&T Alascom vacated Lots 7 and 8, but continued to occupy Lots 5 and 6. Remaining buildings and structures on Lots 5 and 6 were demolished in 2022. A water supply well located near the Power Building was also plugged and abandoned. At the time of soil removal activities conducted in 2023, no infrastructure remained in place.

### 1.2 Regional Hydrogeology

Three aquifers have been described in the vicinity of the King Salmon Airport. They are (in order from shallowest to deepest): the A-Aquifer, the B-Aquifer, and the C-Aquifer (HydroGeoLogic, Inc., 2021).

The depth to the A-Aquifer, which is unconfined, ranges from the ground surface (where the aquifer daylights in communication with surface water bodies and wetlands) to as deep as 45 feet

bgs in the northern portion of the former King Salmon Air Force Station (AFS) (located north of the King Salmon airport). The aquifer is present in lithologic units of sands and silty sands, locally with lenses of gravel, and is generally up to 15 feet in saturated thickness. The groundwater flow direction of the A-Aquifer is typically towards topographic lows and surface water bodies.

At the bottom of the A-Aquifer is a zone of lower hydraulic conductivity referred to as the A-Aquitard. The A-Aquitard is composed of gravelly clayey silt and sandy silt, and ranges from 7 to 22 feet in thickness.

The top of the B-Aquifer has been encountered at depths ranging from 50 to 80 feet bgs and ranges in thickness from 15 to 40 feet. The B-Aquifer is present in lithologic units of silty sands, sandy gravels, and silty sandy gravels. Reportedly, many residential drinking water wells in King Salmon are screened in this aquifer. The potentiometric surface of the B-Aquifer generally matches the A-Aquifer, indicating that the two aquifers are in hydrologic communication and that the A-Aquitard is likely discontinuous or “leaky”. The groundwater flow direction in the B-Aquifer is to the south, towards the Naknek River. The B-Aquitard underlies the B-Aquifer and has been found to range to 10 to 120 feet in thickness.

The C-Aquifer has been encountered at depths of approximately 200 feet bgs and is believed to be a confined aquifer. The former King Salmon AFS water supply wells are screened in the C-Aquifer. The thickness and groundwater flow direction of the C-Aquifer are unknown.

### 1.3 Site Characterization History

Detailed information about previous site characterization activities is included in the Corrective Action Plan (Geosyntec, 2022). A summation of that information is presented below.

A Phase I Environmental Site Assessment (ESA) was completed in 1995. A Phase II ESA was completed in 1997 and identified petroleum contamination at the former 3,000-gallon AST near the Power Building. The Phase I and Phase II reports were not available for review but are referenced in the Soil Remediation Construction Completion Report (Alta Geosciences, Inc. [Alta], 2006). During the Phase II ESA, two soil borings were advanced, one to the west and one to the east of the AST. Soil samples were collected from 8 feet bgs in each boring and analyzed for DRO and benzene, toluene, ethylbenzene, and xylene (BTEX). DRO was detected at 550 and 2,600 milligrams per kilogram (mg/kg) and BTEX were below their detection limits. See the Corrective Action Plan (Geosyntec, 2022) for additional analytical results and further details.

The soil boring logs from the Phase II ESA did not indicate if groundwater was observed in the soil boring and no groundwater samples were collected. The site’s water well was located approximately 30 feet northeast of the Power Building AST and a tap water sample was submitted for analysis during the 1997 investigation. Reportedly, no petroleum hydrocarbons were detected in the tap water sample.

During soil remediation activities associated with a former Garage Building on Lot 7 in 2005, two additional surface soil samples were collected on the north side of the emergency generator tank

and pad near the Power Building. The samples were submitted to the laboratory for DRO analysis; DRO was not detected in either sample.

In February 2010, ADEC issued a decision document for the site, stating that the remaining contamination at the site did not pose an unacceptable risk to human health or the environment (ADEC, 2010). The site was given the designation of Cleanup Complete with Institutional Controls (ICs). This determination was subject to the following conditions:

- Land ownership or use changes must be reported to ADEC.
- A Notice of Residual Contamination was recorded on the ADEC database, documenting that there is contamination remaining on site.
- Any proposal to remove soil or groundwater from the site requires ADEC approval.
- If the Power Building is removed or the contaminated soil near the Power Building becomes accessible, the soil must be evaluated, and the contamination addressed.
- ADEC recommended periodic monitoring of the drinking water well for petroleum hydrocarbon contamination.
- The contaminated soil remaining on the site may not be moved or used in a manner that results in a violation of ADEC water quality standards.

In fall of 2022, the Power Building and existing AST were removed as AT&T Alascom ended their lease on the property with ADOT&PF, triggering the requirement to evaluate and address the contaminated soil near the former AST.

In spring of 2023, Geosyntec oversaw excavation of an estimated 302 cubic yards of DRO-impacted soil from the Power Building AST area (Geosyntec, 2023a). Sidewall confirmation samples were below ADEC cleanup levels except for one sample taken at the southwest corner of the excavation, which contained DRO at 347 mg/kg (exceeding the cleanup level of 250 mg/kg). Additional excavation of soil represented by this sample was not performed at that time as the area borders an easement with buried utilities. During excavation, field evidence indicated that soil impacts extended to the water table.

## **1.4 Purpose and Objectives**

The purpose of this document is to present the results of supplemental characterization of former KSES Power Building AST area completed in July 2023. The objectives of the site characterization were to:

- Evaluate whether former petroleum impacts in subsurface soil have impacted groundwater.
- Complete delineation of subsurface soil contamination near the southwest corner of the April-May 2023 excavation.

## **1.5 Regulatory Summary**

The facility falls under regulatory requirements of ADEC for the presence of contaminants of potential concern (COPCs) in soil around the former Power Building AST area. It was identified as a contaminated site by ADEC in 1997 (File Number 2569.38.007) after real estate transactional due diligence activities. The site was closed in 2010 by ADEC with a condition to notify ADEC if the Power Building was removed (ADEC, 2010). ADEC was notified in 2021 that AT&T planned to vacate the property in 2022.

The site characterization presented in Section 2 meets the regulatory requirements of 18 Alaska Administrative Code (AAC) 75.335(c) under ADEC oversight. Further regulatory requirements for site characterization are presented in Section 2.

## 2. SITE CHARACTERIZATION

This section provides a summary of supplemental site characterization activities and findings for the former Power Building AST at King Salmon Earth Station in King Salmon, AK. Field activities were performed in accordance with the Work Plan Addendum (Geosyntec, 2023b).

### 2.1 Contaminants of Potential Concern

As the petroleum contaminant source was known to be a diesel AST, COPCs include DRO, GRO, petroleum-related VOCs, and PAHs, in accordance with Appendix F of the ADEC Field Sampling Guidance (ADEC, 2022). Soil samples collected for supplemental characterization were analyzed for DRO only, to complete lateral delineation of DRO impacts in the vadose zone.

### 2.2 Project Action Levels

ADEC regulations for site characterization (18 AAC 75.335(c)) require characterization of the extent of hazardous substances (i.e., COPCs) (ADEC, 2023). The regulations provide soil cleanup levels (18 AAC 75.341) and groundwater cleanup levels (18 AAC 75-345) for hazardous substances that are the basis for characterization.

Table 2-1 presents ADEC groundwater cleanup levels for COPCs as project action levels (PALs). The soil PAL for DRO is 250 mg/kg, the ADEC soil cleanup level for DRO for the Under 40 Inch Zone for the Migration to Groundwater Pathway.

**Table 2-1: Groundwater Project Action Levels**

COPC	Groundwater Cleanup Level (µg/L)
DRO	1500
GRO	2200
<b>Petroleum VOCs</b>	
Benzene	4.6
Toluene	1100
Ethylbenzene	15
Xylenes	190
n-Butylbenzene	1000
sec-Butylbenzene	2000
Tert-Butylbenzene	690
Cyclohexane	13000
Propyl benzene	660
n-Hexane	1500
1,2,4-Trimethylbenzene	15
1,3,5-Trimethylbenzene	120
1,2-Dibromoethane	0.075



COPC	Groundwater Cleanup Level (µg/L)
1,2-Dichloroethane	1.7
Cumene	450
Methyl-t-butyl ether	140
<b>PAHs</b>	
Acenaphthene	530
Acenaphthylene	260
Anthracene	43
Benzo(a)anthracene	0.12
Benzo(a)pyrene	0.034
Benzo(b)fluoranthene	0.34
Benzo(g,h,i)perylene	0.26
Benzo(k)fluoranthene	0.80
Chrysene	2.0
Dibenz(a,h)anthracene	0.034
Fluoranthene	260
Fluorene	290
Indeno(1,2,3-c,d)pyrene	0.19
1-Methylnaphthalene	11
2-Methylnaphthalene	36
Naphthalene	1.7
Phenanthrene	170
Pyrene	120

**Key:**

µg/L = micrograms per liter

DRO = diesel range organics

PAH = polynuclear aromatic hydrocarbon

COPC = contaminant of potential concern

GRO = gasoline range organics

VOC = volatile organic compound

## 2.3 Site Characterization Field Activities

Site characterization field activities were conducted between 27 and 30 July 2023. The weather varied from rainy to sunny with temperatures between 50° and 60° Fahrenheit. Appendix A contains field notes, and Appendix B contains a photolog of field activities.

### 2.3.1 Site Preparation

No permits were needed to access the site. Utility operators in King Salmon do not participate in the Alaska 811 Digline. Therefore, local utility operators including Bristol Bay Telecom, Naknek Electric Association, and Bristol Bay Borough Public Works Department were contacted on 20 July 2023, to determine possible subsurface obstructions. The field team obtained a map of telecom lines overlaid on a figure of the site the same day. Mike Peters from the Bristol Bay Borough Public Works Department emailed Matt Faust on 25 July 2023, confirming site activities were not

in the vicinity of subsurface infrastructure. Naknek Electric Association also contacted Matt Faust on 25 July 2023, to notify the team that there were some lines south of the property, but that they were deenergized.

This preparation located only one possible conflict, a Bristol Bay Telecom line running parallel to the road, south of the site, that was not impacted by subsurface investigation.

### **2.3.2 Characterization Program**

The characterization program executed by Geosyntec in July 2023 included drilling six soil borings; recording soil lithology; field screening soil samples for the presence of petroleum hydrocarbons; installing monitoring wells in five of the soil borings; and collecting subsurface soil and groundwater analytical samples.

Five of the six soil borings were advanced to install monitoring wells. The other soil boring, SB-04, was advanced to obtain a soil sample at 7 feet bgs to complete lateral delineation of DRO impacts in the vadose zone at that location. Soil borings were logged to record lithology and obtain field screening soil samples for the presence of petroleum hydrocarbons.

The monitoring wells were installed to evaluate whether former petroleum impacts in subsurface soil have impacted the underlying aquifer.

The project laboratory was SGS North America, Inc. (SGS) in Anchorage, Alaska. At the end of the field effort, Geosyntec delivered sample coolers to SGS's sample receiving facility in Anchorage, Alaska; samples were received well within hold times.

The following subsections discuss each component of the characterization program.

#### **2.3.2.1 Drilling**

Environmental drilling subcontractor GeoTek Alaska (GeoTek) mobilized to the site to conduct drilling operations at the planned locations. Drilling was conducted 27 and 28 July 2023. An 8040DT Geoprobe direct-push drill rig was used with direct push methods and dual tube tooling. This drilling methodology allowed for soil core to be recovered continuously in 5-foot long, clear acetate sleeves. A total of six boreholes were drilled, including five for the purpose of monitoring well installation and one for the purpose of subsurface soil sampling. The monitoring well and boring locations are shown on Figure 2.

Monitoring well borings were planned for a maximum depth of approximately 20 feet bgs, based on an estimated depth to groundwater of 13 feet bgs. However, groundwater was encountered at approximately 9.5 feet bgs. The monitoring well borings were logged for lithology.

Based on the groundwater flow direction towards the southwest, MW-01 was planned as an upgradient well, MW-02 and MW-03 as cross gradient wells, MW-04 as a downgradient well, and MW-05 as the source area well.

GeoTek started drilling activities at the MW-01 soil boring. At 11 ft bgs, GeoTek encountered a confining clay layer. This layer was found at approximately the same depth at other soil boring locations. Due to this confining layer, the field team decided to only drill to approximately 15 ft bgs to avoid drilling through the confining layer and creating a possible pathway to other groundwater bearing zones. Soil boring logs are included as Appendix C.

Four of the five monitoring wells were constructed of 2-inch diameter schedule 40 polyvinyl chloride (PVC) casing with 10-foot 20/40 prepacked screened intervals with 0.010-inch slotted screen. One monitoring well, MW-04, was constructed in the same manner, except the screen interval was only 5 feet long. The ground surface at MW-04 was several feet lower than at the other four monitoring wells; subsequently the clay layer was encountered at a shallower depth. A 5-foot screen was used to keep the top of the screen at least 5 feet bgs and allow construction of a good seal. 10/20 sand was emplaced around each of the prepacked screen and up to approximately 1 foot above the screened interval. This sand was covered with approximately 2 feet of hydrated bentonite to create a seal. The remaining annulus was filled with pea gravel and concrete as needed to reach ground surface. Monitoring wells were completed with flush mount well covers installed with protective concrete pads. Table 2-2 below summarizes well screened intervals and equilibrated water level measurements. Estimated groundwater elevations based on an arbitrary site datum are discussed in Section 2.3.3. Monitoring well construction details are presented in Appendix C.

**Table 2-2: Monitoring Well Details**

Monitoring Well	Screened Interval (ft bgs)	Depth to Water (ft bgs)
MW-01	4.75-14.75	8.69
MW-02	5.03-15.03	9.43
MW-03	4.59-14.59	8.63
MW-04	4.26-9.26	6.10
MW-05	4.77-14.77	8.61

Key:

DTW = depth to water

ft bgs = feet below the ground surface

The soil boring for the purpose of subsurface soil sampling (SB-04) was also drilled using dual tube tooling. The boring was advanced to 8 feet bgs per the Work Plan Addendum (Geosyntec, 2023b). The acetate sleeves were cut open to access soil for logging lithology and collecting samples. Appendix C contains boring logs.

Excess soil from the core sleeve not needed for laboratory samples was containerized into a 55-gallon drum for waste management and disposal (Section 2.3.4).

### 2.3.2.2 Field Screening

Following the observations and logging of soil described in Section 2.3.2.1, field personnel performed field screening with a photoionization detector (PID) for the purpose of supplementing

analytical data. Field screening was performed by collecting the soil from the sleeve into a quart-size plastic bag, sealing the bag, agitating the sample, leaving headspace to develop for at least 10 minutes but not more than one hour in a warm location, agitating the bag again, and finally taking the PID reading from the headspace in the bag.

PID measurements are included on soil boring logs presented in Appendix C.

### ***2.3.2.3 Soil Sampling for Laboratory Analysis***

One soil analytical sample was collected from soil boring SB-04 for laboratory analysis for DRO. As described in the Work Plan Addendum (Geosyntec, 2023b), one soil boring was advanced south of the southwest corner of the April-May 2023 excavation to a depth of approximately 8 feet bgs (Figure 2). PID readings were taken at one-foot intervals along the boring as described in Section 2.3.2.2. As none of the field screening results were above the 5-parts per million (ppm) threshold defined with the Work Plan Addendum, the field team proceeded to collect the sample from the soil boring at approximately 7 ft bgs.

### ***2.3.2.4 Monitoring Well Development***

Monitoring well development for MW-01, MW-02, and MW-03 was initiated no less than 24 hours following well installations. For MW-04 and MW-05, development occurred after at least 18 hours. See Section 2.3.6 (Deviations) for a description of the deviation.

MW-01, MW-02, and MW-03 were developed on 29 July 2023, while MW-04 and MW-05 were developed on 30 July 2023. Well development for MW-01, MW-02, and MW-03 consisted of using a combination of a surge block and submersible pump. Well development for MW-04 and MW-05 consisted of using a submersible pump, only. The surge block was not used on MW-04 and MW-05 as to not disturb the seal (which had been set for a minimum of 18 hours). Between 5-8 well volumes were removed from each well before it was considered developed. Turbidity was not measured quantitatively as the turbidity meter brought to the site was non-functional. See Section 2.3.6 (Deviations) for a description of the Work Plan deviation. Wells were considered developed once water removed ran visually clear. Purging development water was collected into 5-gallon buckets and later consolidated into 55-gallon drums (Section 2.3.4).

Well development logs are included as Appendix D.

### ***2.3.2.5 Groundwater Sampling for Laboratory Analysis***

Groundwater samples were collected from each monitoring well immediately following well development. Groundwater samples were collected using a low-flow sampling method and a stainless-steel Proactive Hurricane submersible pump. Water quality parameters (including temperature, specific conductivity, dissolved oxygen, pH, and oxygen reduction potential) were monitored during purging using a flow-through cell and a YSI multiparameter meter. Turbidity was quantified visually as the turbidity meter brought onsite was non-functional. Once parameters had stabilized in accordance with ADEC guidance (ADEC, 2022), the flow-through cell was disconnected, and the sample stream was directed into the sample containers provided by the

laboratory. Groundwater samples were collected for laboratory analysis for GRO, DRO, PAHs, and petroleum VOCs.

Groundwater sample forms are included as Appendix E.

### 2.3.3 Location Survey

Locations were staked out prior to drilling and surveyed in after drilling, using an Eos Positioning Systems (EOS) Arrow Gold Global Navigation Satellite System (GNSS) unit Bluetooth-connected to Collector for ArcGIS, a mobile app on an Android tablet. The EOS Arrow Gold unit received corrections from a satellite-based real time kinematic services, Atlas H10. The surveyed x-y coordinates of each monitoring well, soil boring, and sample location are provided in Table 2-3.

**Table 2-3: Survey Data**

Location ID	Date	Latitude	Longitude
MW01/SB01	7/28/2023	58.68185353	-156.6664812
MW02/SB02	7/28/2023	58.68158213	-156.6662046
MW03/SB03	7/28/2023	58.68164338	-156.6666326
SB04	7/28/2023	58.68156575	-156.6665557
MW04/SB05	7/29/2023	58.68151446	-156.6664696
MW05/SB06	7/29/2023	58.68161781	-156.6664115
Utility box 1	7/28/2023	58.68155259	-156.6666645
Utility box 2	7/28/2023	58.68144156	-156.6663856
Utility box 3	7/28/2023	58.68145281	-156.6663838

The location survey also included recording the elevation of each monitoring well top-of-casing relative to each other using a laser level. Table 2-4 presents top-of-casing (TOC) elevations relative to MW-01. Applying an arbitrary elevation to MW-01 of 50.00 feet above mean sea level, depth to water measurements were used to generate arbitrary groundwater elevations for the purpose of determining groundwater flow direction (Figure 3).

**Table 2-4: Monitoring Well Top-of-Casing Elevations and Arbitrary Groundwater Elevations**

Monitoring Well	TOC Height Relative to MW-01 (feet)	Arbitrary TOC Elevation (feet AMSL)	DTW (feet below TOC)	Arbitrary Groundwater Elevations (feet AMSL)
MW-01	0.00	50.00*	8.69	41.31
MW-02	+0.39	50.39	9.43	40.96
MW-03	-0.74	49.26	8.63	40.63
MW-04	-3.07	46.93	6.10	40.83
MW-05	-0.47	49.53	8.61	40.92

Note: MW-01 was assigned an arbitrary elevation of 50.00 feet AMSL to be used as a site vertical datum

Key:

AMSL = above mean sea level

DTW = depth to water

TOC = top of casing

### 2.3.4 Waste Management and Waste Sampling

Excess soil cuttings from the core sleeves and auger cuttings were placed into one Department of Transportation (DOT)-approved 55-gallon drum placed on pallet. Decontamination water fluids, well development water, and purge water was placed into a second, DOT-approved 55-gallon drum placed on a pallet. Waste streams were characterized using analytical results from project samples. Additionally, one sample from the drum containing fluids was taken for per- and polyfluoroalkyl substances (PFAS) compounds. This PFAS waste characterization sample was collected because shallow groundwater in King Salmon is commonly impacted with PFAS due to military activities at the King Salmon AFS (located upgradient from the KSES); there are no PFAS sources present on the KSES site.

Used nitrile gloves, paper towels, used core sleeves, and other investigation-derived waste (IDW) generated as solid waste were placed into garbage bags and transported off-site for disposal as municipal household waste.

One pallet with the two drums of waste was staged on the west corner of the site pending sample results. Upon receipt of analytical data, Geosyntec worked with US Ecology to create waste profiles and arrange for pickup, transport, and disposal of the waste. Geosyntec generated ADEC Transport, Treatment and Disposal Approval forms for the two drums and submitted them for ADEC approval on 26 September 2023. ADEC approved the forms on 27 September; copies of the approved forms are included in Appendix F. US Ecology picked up the drums and transported them off site on 18 October; a copy of the partially completed non-hazardous waste manifest is included in Appendix F. A finalized manifest will be included in the final report.

### 2.3.5 Site Reclamation

Upon completion of drilling on 29 July 2023, the soil borehole that was not converted into a monitoring well was backfilled with bentonite chips to 3 feet bgs and then pea gravel to the ground surface. Monitoring well monuments were sealed with bolts. Survey markers were removed.

### 2.3.6 Deviations

Significant deviations from the work plan (Geosyntec, 2023b) include:

- Not allowing MW-04 and MW-05 to rest a minimum of 24 hours between installation and development.
- Not utilizing a turbidimeter for well development and low flow sampling.

During the field effort, there were unexpected shipping limitations encountered at multiple local air cargo providers. These limitations were related to the large number of commercial and recreational fishermen flying out of King Salmon. Most significantly, while in King Salmon the field crew was informed by the local Alaska Air Cargo office that shipments for 30 July 2023 had to be received by 9:00 AM to make it on the airplane that day. This provided a limited time to complete fieldwork, and as such limited the time available between installation and development of MW-04 and MW-05. The Geosyntec project manager decided to develop the wells a few hours early (waiting approximately 18 hours for MW-04 and 19 hours for MW-05) instead of remobilizing on a different date. To protect the seals in the monitoring wells during development, these two wells were developed using purging only. A surge block was not utilized as surging is a relatively aggressive development technique with greater potential to damage the annular seal. Development using a pump only is a recognized technique in ADEC Monitoring Well Guidance (ADEC, 2013), though alternating pumping with use of a surge block is considered more effective.

The turbidimeter (serial number 38573) was rented from TTT Environmental in Anchorage. The meter consistently displayed error code E7 (indicating a light leak) during the field effort and would not read samples. As development and groundwater sampling occurred on a weekend, it was not possible to obtain a replacement instrument. Geosyntec attempted to clean the lid mechanism and tried using the meter in a shaded area to prevent light leaks. However, the field team was unable to resolve the problem and resorted to qualitative turbidity observations.

## 2.4 Groundwater Characterization Findings

### 2.4.1 Data Quality Summary

Geosyntec project chemists performed Stage 2A validation which included data verification and completeness checks of the electronic data to verify that data packages and electronic files included the requested information. The pertinent analytical data were reviewed, including the chain-of-custody and sample receipt records, laboratory case narratives, and laboratory data. The analytical results were provided by the laboratory as Level II deliverables.

Geosyntec chemists noted the following quality control failures:

- Based on the Container ID information provided on the sample results sheets in the laboratory report, two containers used for GRO analysis were received with headspace bubbles greater than 6 millimeters (mm). These include container D for sample 1233915007 (23KSES-MW05-GW) and container C for sample 1233915012 (Trip Blank). Since these containers were received with headspace greater than 6 mm and based on



professional and technical judgment, the estimated GRO concentration in sample 23KSES-MW05-GW and the non-detect GRO result for sample Trip Blank were QL qualified as estimated with low biases.

- Based on the low LCS recovery of dibenzo[a,h]anthracene in Method 8270D SIM batch XXX48345, the non-detect dibenzo[a,h]anthracene results in samples 23KSES-MW01-GW, 23KSES-MW02-GW, 23KSES-MW03-GW, 23KSES-MW04-GW, 23KSES-MW05-GW, and 23KSES-MW06-GW were R qualified as rejected. A rejected result is not usable and, therefore, should be deleted from the report.

Overall, the data quality indicators of precision, accuracy, representativeness, completeness, comparability, and sensitivity were met. Although dibenzo[a,h]anthracene results were rejected, there were no other significant PAH detections, so this rejection is not considered to negatively impact the conclusions of the groundwater characterization. Except for the rejected results, the data, as qualified, are usable for the purposes of the project objectives.

The laboratory analytical report is included as Appendix G and the completed ADEC Laboratory Data Review Checklist is included as Appendix H.

## 2.4.2 Site Lithology

During the July 2023 field work soil borings were logged for site lithology. Near-surface lithology is relatively consistent throughout the site, with the first 8 to 11 feet bgs generally consisting of reddish-brown silty sand. Roots and organics are present in the silty sand layer from 0 to 2 ft bgs, and locally peat layers of approximately 2 inches in thickness were also identified. The soil was saturated at an estimated 9.5 ft bgs in soil borings during the July 2023 fieldwork. Below the silty sand, there is a gravel layer of approximately half a foot in thickness. The gravel layer is underlain by a gray silt and clay layer that extends to the bottom of the borings (15 feet bgs).

Only one soil boring (SB-06/MW-05) varied from this general description, as it was drilled within the extent of the 2023 excavation. In this boring, backfill was found until 11 ft bgs. Below the gravelly, silty sand backfill layer in SB-06 was a gravel layer, followed by the silty clay confining layer.

## 2.4.3 Site Hydrogeology

Saturated soils were generally encountered at depths of approximately 9.5 feet bgs in soil borings advanced on the site (Appendix C), and depth to water measured in monitoring wells ranged from 6 to 9 feet bgs (Appendix E). Using depth to water measurements and relative TOC elevations (Section 2.3.3), Geosyntec generated groundwater contours and a groundwater flow direction (Figure 3). The groundwater flow direction was confirmed to be towards the southwest, approximately the same direction estimated in the work plan (Geosyntec, 2023b). One well (MW-03) which was planned as a cross-gradient well appears to be closer to a down-gradient well based on the July 2023 groundwater flow direction.



#### 2.4.4 Field Screening

Subsurface soil from soil borings was screened for visual and olfactory evidence of petroleum hydrocarbon contamination. Additionally, a PID was used as a field screening tool (methods described in Section 2.3.2.2) at least every 5 ft bgs, as well as whenever visual or olfactory evidence of contamination was discovered. No evidence of petroleum hydrocarbon contamination or PID result exceeded the 5-ppm threshold level for SB-01, SB-02, SB-03, SB-04, or SB-05.

Evidence of contamination was discovered starting at 4 ft bgs in SB-06 (MW-05) with an elevated PID result of 50.8 ppm. Both olfactory evidence and field screening results continued to increase with depth until a peak PID reading of 537.9 ppm taken from 8.0 to 8.5 ft bgs.

PID readings are presented on the soil boring logs provided in Appendix C.

#### 2.4.5 COPC Analytical Results

This section discusses analytical results for soil and groundwater samples collected during the 2023 groundwater characterization. Soil analytical data are summarized on Table 2-3 and groundwater analytical data are summarized on Table 2-4 (both tables are appended to the back of this report). The laboratory analytical report is included as Appendix G and the ADEC laboratory data review checklist is included as Appendix H. Discussion of analytical results is organized in the following paragraphs by data gap being investigated.

Only one primary subsurface soil sample (plus a field duplicate) was collected during this investigation. The soil sample was collected from SB-04 at a depth interval of 6.5 to 7.5 ft bgs and submitted for laboratory analysis for DRO. The DRO concentration in this primary/duplicate pair ranged from 22.0 to 23.5 mg/kg, well below the PAL of 250 mg/kg (Table 2-3). This completes delineation of the lateral extent of soil contamination that exceeds PALs and supports the conclusion that only residual DRO contamination over the PAL is present on the southwestern sidewall of the 2023 excavation.

Groundwater samples were collected from the five newly installed monitoring wells. Analytical results show the primary and duplicate groundwater samples collected from source area well MW-05 exceed the PAL for DRO in groundwater (1.5 milligrams per liter [mg/L]) at concentrations ranging from 10.7 to 13.8 mg/L. MW-05 is in the center of the May 2023 excavation area; these exceedances indicate that the contamination related to releases from AST piping migrated vertically through the unsaturated zone and impacted groundwater.

However, groundwater samples collected from the four other groundwater monitoring wells (including upgradient MW-01, cross gradient well MW-02, and down-gradient wells MW-03 and MW-04) were below detection limits for DRO. Thus, the extent of groundwater contamination is delineated and does not appear to be migrating off site.

### 2.5 Updated Conceptual Site Model

The conceptual site model (CSM) for KSES Power Building has been modified from the one presented in the Corrective Action Plan (Geosyntec, 2022) to accommodate the increased

understanding of the site and to reflect that the vast majority of impacted soil in the unsaturated zone has been removed from the site.

### **2.5.1 Sources and Release Mechanisms**

The source of the petroleum hydrocarbon contamination near the Power Building is the former 3,000-gallon AST that was present at the site in 1997 and removed in 2002. This AST historically contained diesel that was used to fuel the generator in the Power Building. In 2002, the former 3,000-gallon AST was replaced with a double-walled 1,000-gallon AST. The former AST contents were released through leaks and spills prior to 1997, as determined during the 1997 Phase II site investigation. Given that soil contamination was never identified at depths shallower than 3 feet bgs indicates that the diesel release from the former AST system can be attributed to leaks from buried product piping directly to subsurface soil (Geosyntec, 2023a).

### **2.5.2 Transport Mechanisms**

Petroleum hydrocarbons that leaked from buried product piping associated with the former 3,000-gallon AST at the Power Building were released into the subsurface and infiltrated subsurface soils. Contamination migrated laterally in the unsaturated zone as far as approximately 25 feet from the AST piping, and vertically to the groundwater table located at approximately 10 feet bgs. Upon reaching groundwater, the contamination appears to have remained confined to the vicinity of the former AST locations, as DRO has not been detected in downgradient wells MW-03 and MW-04.

### **2.5.3 Nature and Extent of Impacts to Media**

#### **2.5.3.1 Soil**

The vast majority of the DRO-impacted soil in the unsaturated zone was removed during the April-May 2023 removal action (Geosyntec, 2023a). Residual DRO-impacted soil exceeding the migration to groundwater cleanup level is present in a small and defined region on the southwestern sidewall of the 2023 excavation at a depth of approximately 7 feet bgs (Figure 4). No soil contamination that exceeds the human health exposure pathway cleanup level is present in the unsaturated zone.

#### **2.5.3.2 Groundwater**

Groundwater was present at depths ranging from between approximately 6 to 9 feet bgs in the five monitoring wells sampled in July 2023. Groundwater samples collected at source area well MW-05 exceeded the ADEC groundwater cleanup level for DRO, only. None of the other four wells (including wells located up, cross, and down-gradient from the source area) were found to contain detectable concentrations of DRO (Figure 5). No groundwater samples collected from any of the wells exhibited VOCs, PAHs, or GRO at detectable concentrations. Thus, it appears that the extent of groundwater contamination is delineated and remains within 40 feet downgradient from the source area.

### **2.5.3.3 Soil Gas**

No soil gas samples have been collected at the site. There have been no significant detections of VOCs in soil or groundwater at the site.

### **2.5.3.4 Surface Water and Sediment**

There is no surface water or sediment in the vicinity of the site. As the extent of residual soil contamination is limited to subsurface soil at depths of approximately 7 feet bgs, impacts to precipitation or snow melt migrating overland would not occur. The nearest surface water body is the Naknek River, located approximately 0.2 mile to the south southwest.

## **2.5.4 Potential Exposure Pathways and Receptors**

Appendix I contains the ADEC CSM scoping forms summarizing the potential exposure pathways for receptors under current and future land use scenarios.

There are currently no full-time residents at the site. The lot is vacant; current human receptors could include the following:

- Visitors or trespassers.
- Construction workers, including remedial contractors.

If a new facility is constructed on the property by a future leaseholder, future human receptors could include commercial workers.

The following discusses potential exposure pathways for receptors.

Residual soil contamination in the unsaturated zone is present in a small region on the southwestern sidewall of the 2023 excavation in a depth interval from approximately 7 to 9.5 feet bgs (Figure 4). Concentrations of residual soil contamination slightly exceed the migration to groundwater cleanup level but not human health cleanup levels. Given the limited extent and relatively low concentrations of residual soil contamination, subsurface soil exposure pathways are considered insignificant. As surface soil contamination is not present, incidental ingestion of surface soils does not represent an exposure pathway for the receptors listed above. However, construction workers may be potentially exposed to subsurface soils. Construction workers may be exposed to COPCs in soil via incidental ingestion. Dermal absorption exposure pathways are considered incomplete because contaminants evaluated for dermal exposure (those listed in Appendix B of ADEC CSM Guidance [ADEC, 2017]) are not present in soil at significant concentrations.

Groundwater is a complete pathway for receptors that come into contact with site groundwater. The uppermost aquifer (the A-Aquifer) has been demonstrated to be impacted on the site. Reportedly, most drinking water wells in the community of King Salmon are screened in the deeper, B-Aquifer (Section 1.3). However, previous investigations have indicated that the aquitard separating the A- and B-Aquifers is discontinuous, and the two aquifers are in hydraulic communication (HydroGeoLogic, 2021).

Surface water bodies, such as lakes, streams, or ponds, are not present in the vicinity of the site, and thus surface water and sediment are not considered exposure media for the site.

The Power Building was demolished in 2022 and there are currently no occupied buildings present. This is anticipated to change as future lease holders will likely construct hangars on the site. However, there have never been any significant detections of VOCs in soil or groundwater at the site. Thus, vapor intrusion pathways are incomplete.

COPCs are not present in shallow soil that could be taken up into biota. Thus, potential ecological risk is off-ramped.

Appendix I contains the ADEC Ecoscoping form.

### 3. CONCLUSIONS

The objectives of the site characterization have been met. The screening and analytical data are of suitable quality for use in reporting and decision-making. These data allow for lateral and vertical delineation of COPCs.

Residual DRO impacts in subsurface soil are limited to a small region on the southwest sidewall of the 2023 excavation area, in a depth interval of 7 to 9.5 feet bgs (Figure 4). DRO concentrations for this residual soil contamination slightly exceed the ADEC Migration to Groundwater cleanup level, but do not exceed the cleanup level for Human Health Exposure Pathways.

DRO contamination in groundwater is present in the source area at concentrations that exceed ADEC groundwater cleanup levels (Figure 5). The lateral extent of impacted groundwater has been delineated and does not appear to be migrating off-site. Although the identified groundwater contamination is present in the A-Aquifer, which is generally not used for drinking water wells, previous studies have demonstrated that there is hydraulic communication between the A- and B-Aquifers. Most private drinking water wells in King Salmon are screened in the B-Aquifer. Groundwater exposure pathways are complete for current and future receptors.

## 4. RECOMMENDATIONS

Geosyntec recommends that AT&T Alascom perform a second groundwater monitoring event in spring of 2024 for the five monitoring wells on the KSES site for DRO. Upon completion of that monitoring event, Geosyntec recommends using the two round of groundwater data to develop a Long-Term Groundwater Monitoring Plan for the KSES site. If results from the second round of groundwater sampling are comparable to the first, it is likely that the long-term monitoring (LTM) may only be required for a subset of the monitoring wells present on the site and should be limited to DRO analysis only.

Geosyntec notes that development of the site by future leaseholders may conflict with the existing monitoring well network. If any monitoring wells are determined to require removal to support site development, Geosyntec recommends that they be properly decommissioned in accordance with ADEC regulations. A determination should be made as to whether the well to be decommissioned is required for the LTM program. If so, a replacement well should be installed at an appropriate location.

LTM should be continued until groundwater concentrations have decreased below ADEC groundwater cleanup levels, or a consistent decreasing trend can be demonstrated, at which point AT&T Alascom should pursue a determination of Cleanup Complete or Cleanup Complete with ICs for the site with ADEC.

## 5. REFERENCES

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- HydroGeoLogic, Inc. 2021. *Final Site Inspection Addendum, Off-Base Drinking Water Site Inspection*. June.

# TABLES



**Table 2-3. Soil Analytical Results  
King Salmon Earth Station Groundwater Characterization**

Sample ID			23KSES-SB04-SO-6.5	23KSES-SB041-SO-6.5
Sample Depth (feet below ground surface)			6.5	6.5
Analyte	Units	PAL	Primary	Duplicate
<b>Photo-ionization (PID) field screening result - parts per million (ppm)</b>				
PID	ppm	5	1.5	1.5
<b>DRO (AK102)</b>				
Diesel Range Organics	mg/kg	250	23.5	22

Note:

Result is above PAL

mg/kg - milligrams per kilogram  
DRO - diesel range organics  
mg/kg - milligrams per kilogram  
PAL - project action level  
PID - photoionization detector  
ppm - parts per million

**Table 2-4. July 2023 Groundwater Analytical Results  
King Salmon Earth Station Groundwater Characterization**

	Sample ID	23KSES-MW01-GW	23KSES-MW02-GW	23KSES-MW03-GW	23KSES-MW04-GW	23KSES-MW05-GW	23KSES-MW06-GW
Analyte	Units	PAL				Primary	Duplicate
<b>PAHs (8270D SIM)</b>							
1-Methylnaphthalene	µg/L	11	0.0261 U	0.0245 U	0.0255 U	0.0245 U	0.0250 U
2-Methylnaphthalene	µg/L	36	0.0225 J B	0.0239 J B	0.0250 J B	0.0208 J B	0.0254 J B
Acenaphthene	µg/L	530	0.0261 U	0.0245 U	0.0255 U	0.0245 U	0.142
Acenaphthylene	µg/L	260	0.0261 U	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Anthracene	µg/L	43	0.0261 U	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Benzo(a)Anthracene	µg/L	0.12	0.0261 U QL	0.0160 J B	0.0167 J B	0.0245 U	0.0250 U
Benzo[a]pyrene	µg/L	0.034	0.0104 U QL	0.00980 U	0.0102 U	0.00980 U	0.0100 U
Benzo[b]Fluoranthene	µg/L	0.34	0.0261 U QL	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Benzo[g,h,i]perylene	µg/L	0.26	0.0261 U QL	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Benzo[k]fluoranthene	µg/L	0.8	0.0261 U QL	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Chrysene	µg/L	2	0.0261 U QL	0.0148 J	0.0169 J	0.0245 U	0.0151 J
Dibenzo[a,h]anthracene	µg/L	0.034	R	R	R	R	R
Fluoranthene	µg/L	260	0.0202 J B	0.0212 J B	0.0165 J B	0.0169 J B	0.0299 J B
Fluorene	µg/L	290	0.0261 U	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Indeno[1,2,3-c,d] pyrene	µg/L	0.19	0.0261 U QL	0.0245 U	0.0255 U	0.0245 U	0.0250 U
Naphthalene	µg/L	1.7	0.0520 U	0.0490 U	0.0510 U	0.0490 U	0.0500 U
Phenanthrene	µg/L	170	0.0520 U	0.0490 U	0.0510 U	0.0490 U	0.0500 U
Pyrene	µg/L	120	0.0205 J B	0.0173 J B	0.0181 J B	0.0152 J B	0.0418 J B
<b>GRO (AK101)</b>							
Gasoline Range Organics	mg/L	2.2	0.0500 U	0.0961 J	0.0811 J	0.0530 J	0.0810 J QL
<b>DRO (AK102)</b>							
Diesel Range Organics	mg/L	1.5	0.330 U	0.306 U	0.330 U	0.306 U	13.8
<b>VOCs (SW8260D)</b>							
1,2,4-Trimethylbenzene	µg/L	15	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dibromoethane	µg/L	0.075	0.0375 U	0.0375 U	0.0375 U	0.0375 U	0.0375 U
1,2-Dichloroethane	µg/L	1.7	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U
1,3,5-Trimethylbenzene	µg/L	120	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Benzene	µg/L	4.6	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
Cyclohexane	µg/L	13000	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Ethylbenzene	µg/L	15	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Isopropylbenzene (Cumene)	µg/L	450	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Methyl-t-butyl ether	µg/L	140	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Naphthalene	µg/L	1.7	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Toluene	µg/L	1100	0.500 U	0.500 U	0.500 U	0.500 U	0.310 J
Xylenes (total)	µg/L	190	1.50 U	1.50 U	1.50 U	1.50 U	1.50 U
n-Butylbenzene	µg/L	1000	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
n-Propylbenzene	µg/L	660	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
n-hexane	µg/L	1500	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
sec-Butylbenzene	µg/L	2000	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
tert-Butylbenzene	µg/L	690	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U

Note:

Result is above PAL

-- indicates not analyzed for

µg/L - micrograms per liter

mg/L - milligrams per liter

DRO - diesel range organics

GRO - gasoline range organics

J - The analyte was positively identified, but the associated result was less than the limit of quantitation (LOQ) and greater than or equal to the detection limit.

B - The analyte was detected in the method blank or the trip blank above the limit of detection (LOD), and the concentration in the sample did not exceed the blank concentration by a factor of 5

(factor of 10 for common laboratory contaminants acetone and methylene chloride).

QH - The analyte result is considered an estimated value biased high due to a quality control failure.

QL - The analyte result is considered an estimated value biased low due to a quality control failure.

QN - The analyte result is considered an estimated value with uncertain bias due to a quality control failure.

R - The result was rejected. A rejected result was not usable and therefore was deleted from the report.

LOD - limit of detection

mg/kg - milligrams per kilogram

PAHs - polynuclear aromatic hydrocarbons

PAL - project action level

ppm - parts per million

U - validation qualifier indicating the analyte was analyzed for but was not detected above the reported sample quantitation limit

VOCs - volatile organic compounds

**Table 2-5. Wastewater (IDW) Analytical Results - PFAS  
King Salmon Earth Station Groundwater Characterization**

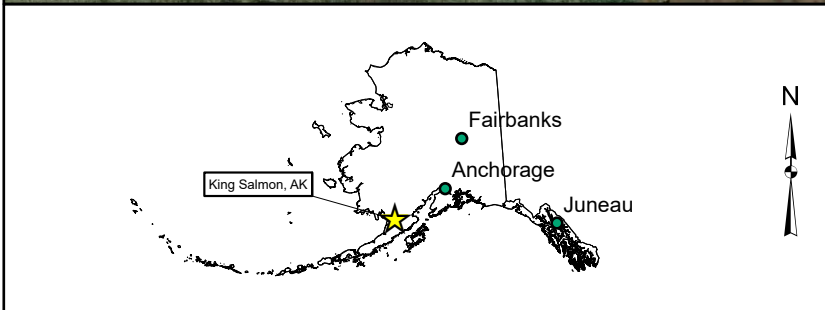
	Sample ID	23KSES-IDW-WA
Analyte	Units	
<b>PFAS Compounds (EPA 537M BY ID)</b>		
<b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>		
Perfluorobutanoic acid	µg/L	0.121
Perfluoropentanoic acid	µg/L	0.508
Perfluorohexanoic acid	µg/L	0.558
Perfluoroheptanoic acid	µg/L	0.266
Perfluorooctanoic acid (PFOA)	µg/L	0.0255
Perfluorononanoic acid	µg/L	0.0135
Perfluorodecanoic acid	µg/L	0.0042 U
Perfluoroundecanoic acid	µg/L	0.021 U
Perfluorododecanoic acid	µg/L	0.021 U
Perfluorotridecanoic acid	µg/L	0.021 U
Perfluorotetradecanoic acid	µg/L	0.0042 U
<b>PERFLUOROALKYL SULFONIC ACIDS</b>		
Perfluorobutanesulfonic acid	µg/L	0.321
Perfluoropentanesulfonic acid	µg/L	0.473
Perfluorohexanesulfonic acid	µg/L	0.853
Perfluoroheptanesulfonic acid	µg/L	0.0048
Perfluorooctanesulfonic acid (PFOS)	µg/L	0.0218
Perfluorononanesulfonic acid	µg/L	0.0042 U
Perfluorodecanesulfonic acid	µg/L	0.021 U
<b>PERFLUOROCTANESULFONAMIDES</b>		
PFOSA	µg/L	0.0083 U
<b>PERFLUOROCTANESULFONAMIDOACETIC ACIDS</b>		
MeFOSAA	µg/L	0.0083 U
EtFOSAA	µg/L	0.042 U
<b>FLUOROTELOMER SULFONATES</b>		
4:2 Fluorotelomer sulfonate	µg/L	0.0083 U
6:2 Fluorotelomer sulfonate	µg/L	0.0062
PFOS + PFOA	µg/L	0.0473

Note:

-- indicates not analyzed for  
 NR - not regulated by ADEC  
 µg/L - micrograms per liter  
 mg/L - milligrams per liter  
 LOD - limit of detection  
 mg/kg - milligrams per kilogram  
 ppm - parts per million  
 U - not detected

# FIGURES





N

**Site Location**  
King Salmon Earth Station  
King Salmon, Alaska

**Geosyntec**  
consultants








PNG0967	September 2023
---------	----------------

**Figure**  
**1**





**Legend**

-  Monitoring Wells
-  Soil Boring
-  Former 3000-gallon AST
-  New Lot Boundaries
-  Existing Building Footprint
-  Proposed Building Footprint
-  Excavation Extent



**Site Map**

King Salmon Earth Station  
King Salmon, Alaska



**Figure**

**2**

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September 2023



July 2023 water level elevations provided for each monitoring well are accurate only to a site specific datum. Elevations were calculated using a field survey of tops of casing for each well relative to MW-01, which was assigned an arbitrary elevation of 50.00 feet above mean sea level. Precise elevation above mean sea level is unknown.

**Legend**

- Monitoring Wells (with 7/2023 water level elevation)
- Soil Boring
- Former 3000-gallon AST
- Excavation Extent
- Lot Boundaries
- GW Contours 7/2023
- Groundwater Flow Direction

0 60 Feet

**July 2023 Groundwater Contours**

King Salmon Earth Station  
King Salmon, Alaska

**Geosyntec**  
consultants

**Figure 3**

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ADEC DRO Cleanup Level: 250 mg/kg

Definitions:  
 ND = not detected (reporting limit in parentheses)  
 DRO = diesel range organics

**Legend**

- Soil Boring
- Former 3000-gallon AST
- Extent of Residual DRO
- Excavation Extent
- Lot Boundaries
- Sidewall Sample Location Below ADEC Cleanup Levels
- Sidewall Sample Location Exceeds ADEC Cleanup Levels

N  
 0 40 Feet

**Soil Analytical Data**

King Salmon Earth Station  
King Salmon, Alaska

PNG0967

September 2023

**Figure**

**4**





ADEC DRO Groundwater Cleanup Level : 1.5 mg/L

Definitions:  
 ND = not detected at the reporting limit shown in parentheses  
 mg/L = milligrams per liter  
 DRO = diesel range organics

**Legend**

- Monitoring Wells
- Former 3000-gallon AST
- New Lot Boundaries
- Groundwater Flow Direction
- Existing Building Footprint
- Proposed Building Footprint
- Excavation Extent
- Extent of DRO Groundwater Contamination Exceeding ADEC Cleanup Levels

0 60 Feet

**July 2023 Groundwater Analytical Data**

King Salmon Earth Station  
King Salmon, Alaska

**Geosyntec**  
consultants

**Figure 5**

PNG0967      September 2023

# **APPENDIX A**

## **Field Notes**

MADE IN TACOMA

— SINCE 1916 —

*Rite in the Rain®*

— DEFYING MOTHER NATURE —

Name

Matt Faust

Address

Geosyntec

3003 Minnesota Drive  
Anchorage, AK 99503

Phone

(907) 382-3826

Project

PNG 0967

King Salmon Earth  
Station

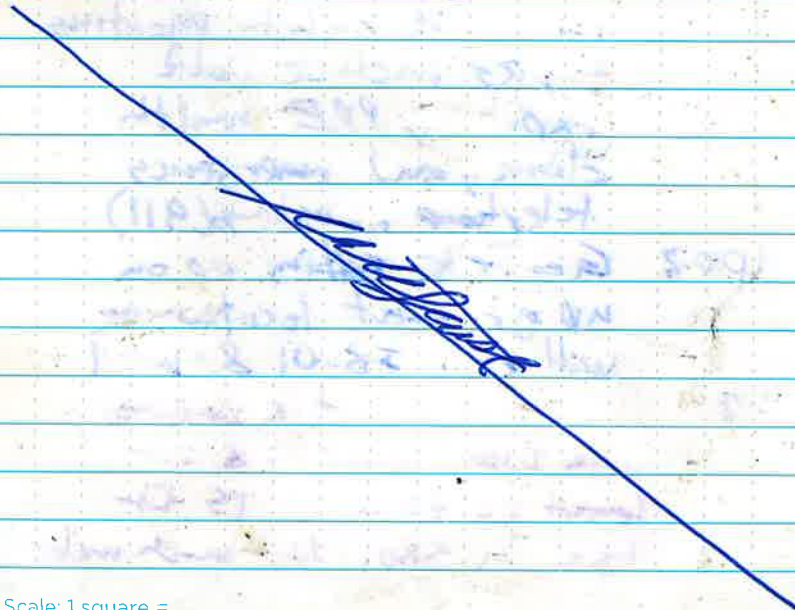
## CONTENTS

PAGE	REFERENCE	DATE
2	Mobilization	7/27
3	Install MW-01, MW-02, MW-03, SB-04	7/28 7/29
7	Install MW-04, MW-05 sample MW-01, MW-02, MW-03	
11/8	Sample MW-04, MW-05	7/30



RiteintheRain.com



- 2 27 July 2023
- 0810 Matt Faust & Emma Bristol from Geosyntec arrive in King Salmon
  - 1830 Pick up rental truck @ Eagle Eye
  - 1850 Check into Sockeye Cabins
  - 1905 Quick site visit, all proposed drilling locations appear to be clear.
  - 1920 Pick up air cargo, all pieces arrived
  - 1945 End of day
- 

Scale: 1 square = \_\_\_\_\_

- 3 28 July 2023
- 0838 Geosyntec on site. Calibrated PID @ 732 check reading 100.1 ppm Also marking drill locations
  - Weather: Heavy rain, calm winds
  - 0930 GeoTek arrives on site Dave and Jordan. Quick site walk, adjust two drill locations (up gradient and down gradient) for accessibility issues
  - 0945 Tailgate safety meeting topics include cold exposure, PPE, health clinic, and emergency telephone numbers (911)
  - 1003 GeoTek setting up on up gradient location, we will call SB-01 & MW-01
  - 1100 Have encountered a confining layer (Clay) @ 11 ft & at least as deep as 15 ft bss. in SB01. Not much water

Scale: 1 square = \_\_\_\_\_

*Return to the Rain*



28 July 2023

1130 Static water level in SB01  
 ~ 9 ft bgs, will install  
 well screen targeting  
 15-5 ft bgs. 1 ft of  
 sand above screen,  
 2 ft seal gets us to  
 ~ 2 ft bgs for monument

1150 Installing upgradient  
 MW01 in SB01

1200 Geotek moving on to  
 SB02, eastern cross  
 gradient well.

1245 setting MW02 in SB02, w/  
 screen 15-5 ft bgs, same  
 completion / construction as  
 MW01

1300 SWL in MW02 measured  
 @ 10.23 ft below TOC  
 geotek setting up to drill  
 SB03 (western cross  
 gradient boring)

1400 MW03 set in SB02, same  
 construction as MW01 &  
 MW02, WL @ 9.39 ft below  
 top of casing.

28 July 2023

1405 Geotek drilling SB04,  
 the step out soil borings

0-5 ft, brown, silts, gravels  
 fn graded sand. Gravel  
 rich layers @ 3 and 4.5  
 ft bgs (2 inch layers)  
 5-6 ft as above

2 inch dark brown silt  
 layer @ 6.0 ft

6-7 ft reddish brown  
 silt fn sand w/silt  
 another 2 inch brown  
 silt layer @ 7 ft

7-8 ft clean, gray, well sorted  
 fn/med sand.

1432 Running SB04 PIDs

0-1 ft bgs = 0.9	5-6 = 2.0
1-2 ft bgs = 2.7	6-7 = 1.5
2-3 ft bgs = 0.5	7-8 = 1.0
3-4 ft bgs = 0.4	
4-5 ft bgs = 1.5	



28 July 2023

1450 Collecting soil sample

23 KSES-SB04-SO-6.5

and its duplicate

23 KSES-SB04-SO-6.5

from 6.5-7.5 ft bss

depth interval in SB04

Grave duplicate sample

a false time of 1530

1523 Geotek waiting on

materials for last two

wells, currently building

flush mounts for MW-01,

MW-02, MW-03

1630 Wells completed, all

personel leaving site

~~23 KSES-SB04-SO-6.5~~

29 July 2023

0900 Stop by AKAir Cargo to ask about Sunday hours & learn that they have an embargo due to excess load & are not accepting shipments all weekend.

0915 Go to King Salmon Ground, open until 2 PM today, & 9 AM on Monday. (closed on Sunday)

0918 On site, Geotek is setting up on SB05 (down gradient location)

0930 Crew drilling on SB05  
Calibrating PID

1002 Measuring DTW in wells installed yesterday

Well ID	DTW (ft below TOC)
MW-01	8.70 ft
MW-02	9.41 ft
MW-03	8.65 ft

1026 Crew installing MW04 in SB05. Will set from 10-5 feet as grime encountered water & clay/silt @ shallower depth, also



29 July 2023

don't want to set top of screen much shallower than 5 ft bgs to maintain a good seal.

1034 Geotek setting up on SB-06, source area boring.

1114 Setting MW05 in SB06. Will screen 15-5 ft. Don't want top of screen any shallower (to get good seal) or deeper (to capture higher water levels, seasonal). Also don't want to miss screen in saturated gravels b/w 10 & 11 ft bgs. Well construction above 5 ft bgs identical for all S wells: 4-5 ft = sand

2-4 ft = bentonite seal

0-2 ft = pea gravel & concrete monument

Also, for MW-04, driller filled 15-10 ft w/ bentonite grout

1118 Geosyntec setting up to develop MW-01

1148 Calibration check YSI no. 3098

Scale: 1 square = \_\_\_\_\_

29 July 2023

YSI was out of range for pH & specific conductance. Recalibrated pH & conductivity as well as DO

1210 Begin purging MW-01

1249 Turbidimeter SSN 38573

non functional, recording light leak (error code E7). Will go w/ visual monitoring forward.

1309 MW01 developed, runways clear

1322 Begin developing MW-02

1350 MW-02 runways very clear & making great water. Calling it developed

1447 MW-03 runways quite clear, calling it developed

1510 Begin sampling MW-01

1550 Collected 23KSES-MW01-GW plus double volume for MS/MSD

1630 Begin purging MW-02

1655 Collected 23KSES-MW02-GW @ MW-02

1720 Begin purging MW-03

Scale: 1 square = \_\_\_\_\_



1742 Collected 12KSES-MW03-GW  
@ MW02

1800 Begin on laser level  
survey of MW tops of castles

Monitor Well	Diff in Elev from MW01	Height from Laser Level
MW-01	0.00	6.15
MW-02	+0.39	5.76
MW-03	+0.74	6.89
MW-04	-3.07	9.22
MW-05	-0.47	6.62

1947 Done for the day

30 July 2023

11

0435 Geosyntec on site  
Getting set to develop  
MW-04. Has been 18  
hours since installation. Due  
to shipping issues, we  
need to have all samples  
collected by 0900, so are  
cutting the 24-hour  
period a little short. Has  
not rained since this well  
was installed. Will be  
developing by pump only  
to (No surge) to avoid  
disturbing the seal.

0440 Performed YSI confidence  
check. All out of range.  
Will now calibrate pH and  
DO

0553 Begin purging MW04

0604 Begin collecting groundwater  
sample 23KSES-MW04-GW  
@ MW-04. Water looks to  
be very clear.

0632 Begin developing MW-05  
strong petio odor



30 July 2023

0649 Water runs clear, MW-05 developed.

0705 Begin purging MW-05

0720 Stabilized, begin collecting Q3 KSES-MW-05

and its field duplicate

Q3 KSES-MW05-GW

Will give duplicate a false time of 0800

0751 Collecting IDW water sample from waste

drum Q3 KSES-IDW-WA

0812 Finished sealing up & labeling IDW

1 drum (~30 gallons) of soil cuttings & ~~TA~~

1 drum (~40 gallons) of IDW water, plus one empty drum

0825 Geosyntec leaving site

~~\_\_\_\_\_~~

# APPENDIX B

## Photo Log



Photo 1. Overall site, looking south. Date 7/28/2023



Photo 2. Installing MW-01, looking North. Date: 7/28/2023.





Photo 3. MW-01 installed, looking North. Date: 7/28/2023



Photo 4. Pin flag at site of planned MW-02, looking southeast. Date: 7/28/2023





*Photo 5. Sampling at MW-02, looking west. Date 7/29/2023*



*Photo 6. Performing location survey at MW-03, looking southwest. Date :7/30/2023*





Photo 7. MW-03, looking west. Date 7/30/2023



Photo 8. Pin flag at site of proposed MW-04, looking South. Date: 7/28/2023.





*Photo 9. MW-04, looking south. Date 7/30/2023*



*Photo 10. MW-05, looking northeast. Date 7/30/2023*





Photo 11. SB-02 14 ft bgs, plastic clay. Date: 7/28/2023.



Photo 12. Drilling SB-03, looking southeast. Date: 7/28/2023.





Photo 13. SB-03 5-10 ft bgs, sandy. Date: 7/28/2023..



Photo 14. Drilling SB-04, looking southeast. Date: 7/28/2023.

**APPENDIX C**  
Soil Boring Logs with  
Well Construction Diagrams

<b>CLIENT</b> <u>AT&amp;T Alascom</u>	<b>PROJECT NAME</b> <u>King Salmon Earth Station</u>
<b>PROJECT NUMBER</b> <u>PNG0967</u>	<b>PROJECT LOCATION</b> <u>King Salmon, AK</u>
<b>DATE STARTED</b> <u>7/28/23</u> <b>COMPLETED</b> <u>7/28/23</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>4.5"</u>
<b>DRILLING CONTRACTOR</b> <u>GeoTek Alaska</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push</u>	▽ <b>AT TIME OF DRILLING</b> <u>9.00 ft</u>
<b>LOGGED BY</b> <u>Matt Faust</u> <b>CHECKED BY</b> _____	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> _____	▽ <b>AFTER DRILLING</b> <u>8.90 ft</u>

GENERAL BH/TP/WELL NO SAMPLE/PID - ANIAK\_GINT\_TEMPLATE.GDT - 8/11/23 11:44 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\CL\PROJECTS\KSES\_GW\_2023.GPJ

DEPTH (ft)	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0		No petroleum odor, moist	SM		(SM) Brown silty sand, with roots and organics	<p>Casing Type: 2" schedule 40 PVC</p> <p>Concrete monument</p> <p>Pea gravel</p> <p>Bentonite seal</p> <p>Sand</p> <p>20/40 silica sand pre-pack filter</p> <p>Sump</p>
2.0	95	Same as above	SM		(SM) Same as above with trace sand, without roots	
4.0		PID 0.1 ppm	SP		(SP) Reddish-brown fine sand, well-sorted	
6.0			SP		(SP) Well-sorted, moist gray sand. No petroleum odor. Medium grained.	
8.5			SP		(SP) Fine, moist, gray sand	
9.5			GM		(GM) Silty, sandy gravel	
10.5			CL		(CL) Plastic gray clay	
11.0			CL		(CL) Sandy, gravelly, gray silt and clay. Stiff, moist	
14.0	100		ML		(ML) As above, more sand	
15.3		PID 0.0 ppm				

Bottom of borehole at 15.3 feet.

<b>CLIENT</b> <u>AT&amp;T Alascom</u>	<b>PROJECT NAME</b> <u>King Salmon Earth Station</u>
<b>PROJECT NUMBER</b> <u>PNG0967</u>	<b>PROJECT LOCATION</b> <u>King Salmon, AK</u>
<b>DATE STARTED</b> <u>7/28/23</u> <b>COMPLETED</b> <u>7/28/23</u>	<b>GROUND ELEVATION</b> _____ <b>HOLE SIZE</b> <u>4.5"</u>
<b>DRILLING CONTRACTOR</b> <u>GeoTek Alaska</u>	<b>GROUND WATER LEVELS:</b>
<b>DRILLING METHOD</b> <u>Direct Push</u>	▽ <b>AT TIME OF DRILLING</b> <u>8.50 ft</u>
<b>LOGGED BY</b> <u>Matt Faust</u> <b>CHECKED BY</b> _____	<b>AT END OF DRILLING</b> <u>---</u>
<b>NOTES</b> _____	▽ <b>AFTER DRILLING</b> <u>8.60 ft</u>

GENERAL BH/TP/WELL NO SAMPLE/PID - ANIAK\_GINT\_PROJECTTEMPLATE.GDT - 8/11/23 11:44 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\CL\PROJECTS\KSES\_GW\_2023.GPJ

DEPTH (ft)	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						Casing Type: 2" schedule 40 PVC
0 - 2.0			SM	[Pattern]	(SM) Dark brown, silty fine-medium sand, trace gravel, roots and organics	Concrete monument Pea gravel
2.0 - 3.0	60	PID 1.1 ppm	SM	[Pattern]	(SM) Dark brown silty fine-medium sand	Bentonite seal
3.0 - 4.5		PID 0.0 ppm			2" silt-free sand layer at 3 ft	
4.5 - 5.5			SP	[Pattern]	2" organic peat layer at 4 ft	Sand
5.5 - 7.0			SP	[Pattern]	(SP) Clean well-sorted, fine, brown-gray sand, some roots	
7.0 - 11.5			SP	[Pattern]	(SP) Gray, well-sorted fine moist sand	
11.5 - 12.0		No petroleum odor			(SP) Fine-medium sand	
12.0 - 14.0		PID 0.0 ppm			2" gravelly sand layer at 7 ft	
14.0 - 15.5		PID 0.3 ppm	GW	[Pattern]	Saturated at 9.5 ft	20/40 silica sand pre-pack filter
		PID 0.0 ppm	CL	[Pattern]	(GW) Fine-medium gravelly sand, poorly sorted	
			CL	[Pattern]	(CL) Brownish gray silty clay, wet, with gravel to 2" diameter	
			CL	[Pattern]	(CL) As above, but moist/dry	Sump

Bottom of borehole at 15.5 feet.

**CLIENT** AT&T Alascom **PROJECT NAME** King Salmon Earth Station  
**PROJECT NUMBER** PNG0967 **PROJECT LOCATION** King Salmon, AK  
**DATE STARTED** 7/28/23 **COMPLETED** 7/28/23 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4.5"  
**DRILLING CONTRACTOR** GeoTek Alaska **GROUND WATER LEVELS:**  
**DRILLING METHOD** Direct Push **▽ AT TIME OF DRILLING** 8.00 ft  
**LOGGED BY** Matt Faust **CHECKED BY** \_\_\_\_\_ **AT END OF DRILLING** ---  
**NOTES** \_\_\_\_\_ **▽ AFTER DRILLING** 8.80 ft

GENERAL BH/TP/WELL NO SAMPLE/PID - ANIAK\_GINT\_TEMPLATE.GDT - 8/11/23 11:44 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\CL\PROJECTS\KSES\_GW\_2023.GPJ

DEPTH (ft)	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0		PID 0.2 ppm	SP		(SP) Gravelly fine gray sand, moist	<p>Casing Type: 2" schedule 40 PVC            Concrete monument            Pea gravel            Bentonite seal            Sand            20/40 silica sand pre-pack filter            Sump</p>
2.0	90	No petroleum odor	SM		(SM) Dark brown silty fine sand with gravel to 1.5" diameter	
3.0		No petroleum odor	SP		(SP) Grayish brown well-sorted fine sand, moist	
4.5		PID 0.3 ppm	SM		(SM) Reddish brown silty fine sand 2" silt layer at 4.5 ft	
5.5			SP		(SP) Well-sorted, moist, fine-medium sand	
8.0	95	No petroleum odor	SM		(SM) Saturated silty fine sand	
10.5	100	No petroleum odor	CL		Gravel to 1" diameter at 10.5 ft (CL) Moist, plastic, silty clay with gravel (up to 1" diameter) ~10% and sand	
15.1		PID 0.2 ppm				

Bottom of borehole at 15.1 feet.



**CLIENT** AT&T Alascom **PROJECT NAME** King Salmon Earth Station  
**PROJECT NUMBER** PNG0967 **PROJECT LOCATION** King Salmon, AK  
**DATE STARTED** 7/29/23 **COMPLETED** 7/29/23 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4.5"  
**DRILLING CONTRACTOR** GeoTek Alaska **GROUND WATER LEVELS:**  
**DRILLING METHOD** Direct Push **AT TIME OF DRILLING** 7.00 ft  
**LOGGED BY** Matt Faust **CHECKED BY** \_\_\_\_\_ **AT END OF DRILLING** ---  
**NOTES** \_\_\_\_\_ **AFTER DRILLING** 6.20 ft

GENERAL BH/TP/WELL NO SAMPLE/PID - ANIAK\_GINT\_TEMPLATE.GDT - 8/11/23 11:44 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\CL\PROJECTS\KSES\_GW\_2023.GPJ

DEPTH (ft)	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0						Casing Type: 2" schedule 40 PVC
0 - 2.0			SM	(SM) Silty fine-medium sand with gravel. Gray, moist.		Concrete monument
2.0 - 2.5	95	No petroleum odor PID 1.0 ppm	PT	(PT) Brown silt and dark brown peat with fine sand, moist		Pea gravel
2.5 - 3.0		No petroleum odor PID 0.0 ppm	SM	(SM) Redish brown silty fine sand, moist		Bentonite seal
3.0 - 5.0			SP	(SP) Gray, moist, well sorted fine sand		Sand
5.0 - 8.3		No petroleum odor		As above, but coarser medium sand. Saturated.		20/40 silica sand pre-pack filter
8.3 - 8.5	100	PID 0.2 ppm	GW	(GW) Sandy gravel, gravel to 1.5" diameter		
8.5 - 10.0			CL	(CL) Saturated gray silty clay with gravel to 1"		
10.0 - 15.0	100	PID 0.2 ppm	CL	(CL) Moist silty clay with gravel and medium to coarse sand. Locally orange coloration, but 90% gray		Sump

Bottom of borehole at 15.0 feet.

**CLIENT** AT&T Alascom **PROJECT NAME** King Salmon Earth Station  
**PROJECT NUMBER** PNG0967 **PROJECT LOCATION** King Salmon, AK  
**DATE STARTED** 7/29/23 **COMPLETED** 7/29/23 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4.5"  
**DRILLING CONTRACTOR** GeoTek Alaska **GROUND WATER LEVELS:**  
**DRILLING METHOD** Direct Push **AT TIME OF DRILLING** 8.00 ft  
**LOGGED BY** Matt Faust **CHECKED BY** \_\_\_\_\_ **AT END OF DRILLING** ---  
**NOTES** \_\_\_\_\_ **AFTER DRILLING** 8.80 ft

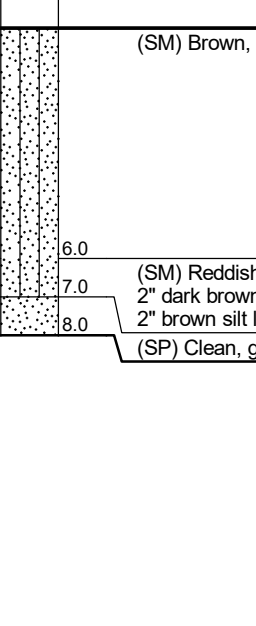
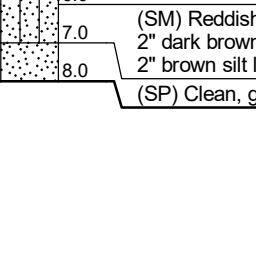
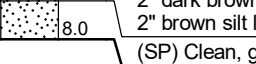
GENERAL BH/TP/WELL NO SAMPLE/PID - ANIAK\_GINT\_PROJECTTEMPLATE.GDT - 8/11/23 11:44 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\CL\PROJECTS\KSES\_GW\_2023.GPJ

DEPTH (ft)	RECOVERY %	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	WELL DIAGRAM
0		PID 0.5 ppm			(SM) Backfill. Brown silty, gravelly sand, moist	Casing Type: 2" schedule 40 PVC Concrete monument Pea gravel
5	80	No petroleum odor PID 50.8 ppm	SM		Same as above, some petroleum odor	Bentonite seal Sand
10	70	Some petroleum odor Strong petroleum odor PID 537.9 ppm	SM		8.0 8.0 (SM) Silty, fine gray saturated sand	
100		PID 381.3 ppm Petroleum odor	SW		10.8 11.0 Same as above, coarser sand (fine-medium) (SW) Gravel, sandy, saturated	20/40 silica sand pre-pack filter
15		Strong petroleum odor PID 5.5 ppm	CL		(CL) Gray, sandy, silt/clay with gravel to 2", saturated As above, moist	Sump

Bottom of borehole at 15.3 feet.

**CLIENT** AT&T Alascom **PROJECT NAME** King Salmon Earth Station  
**PROJECT NUMBER** PNG0967 **PROJECT LOCATION** King Salmon, AK  
**DATE STARTED** 7/28/23 **COMPLETED** 7/28/23 **GROUND ELEVATION** \_\_\_\_\_ **HOLE SIZE** 4.5"  
**DRILLING CONTRACTOR** GeoTek Alaska **GROUND WATER LEVELS:**  
**DRILLING METHOD** Direct Push **AT TIME OF DRILLING** ---  
**LOGGED BY** Matt Faust **CHECKED BY** \_\_\_\_\_ **AT END OF DRILLING** ---  
**NOTES** \_\_\_\_\_ **AFTER DRILLING** ---

GENERAL BH/TP/WELL NO SAMPLE/PID - ANIAK\_GINT\_PROJECTTEMPLATE.GDT - 8/11/23 11:44 - C:\USERS\PUBLIC\DOCUMENTS\BENTLEY\GINT\PROJECTS\KSES\_GW\_2023.GPJ

DEPTH (ft)	REMARKS	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION
0				
0 - 6.0	PID 0.9 ppm PID 2.7 ppm PID 0.5 ppm PID 0.4 ppm PID 1.5 ppm PID 2.0 ppm	SM		(SM) Brown, silty, gravelly fine grained sand. Gravel-rich layers at 3 ft and 4.5 ft bgs (4" layers)
6.0 - 7.0	PID 1.5 ppm 23KSES-SB04-SO-6.5 PID 1.0 ppm	SM		(SM) Reddish brown fine sand with silt 2" dark brown silt layer at 6 ft
7.0 - 8.0		SP		(SP) Clean, gray, well-sorted fine-medium sand 2" brown silt layer at 7 ft
8.0				Bottom of borehole at 8.0 feet.



# APPENDIX D

## Well Development Logs

## WELL DEVELOPMENT LOG

Project Name: KSES  
 Project Number: PMG09167  
 Site: KSES

Date: 7/29/23  
 Weather: cloudy 60°  
 Sample Collected by: \_\_\_\_\_

### Well Data

Well I.D.: MW-01  
 Well Diameter (in.): 2 in

Depth to Surface Water (ft): 8.7 ft  
 Well Depth (ft): 15 ft

### Well Purging

Method/Equipment: Surge block + submersible pump  
 pH/Cond/turb meter ID #: 3098  
 Water Column Length (ft): 6.3 ft

Volume of Water in Well (gal): 1 gal  
 Depth of Pump (ft): 14.5 ft  
 Total Volume Purged (gal): 8 gal

Time	Volume Purged	% Fines	pH (pH units)	Cond. (µS/cm)	Turbidity (NTU)	Temp (°C)	Comments
12:14	1 gal						Surge block
12:28	1.5 gal		6.33		OVR	10.13°	switch to submers. pump
12:36	2 gal		6.21		OVR	7.9°	begin to clear
12:43	4 gal		6.05	312	cloudy	6.85°	begin to clear
12:54	5 gal		5.98	318	cloudy	6.76°	same as above
12:58	6 gal		5.96	304	cloudy	5.93°	same as above
13:01	6.5		5.88	300	less cloudy	5.84°	
13:05	7.0		5.85	296	less cloudy	6.01°	
13:09	8.0		5.79	292	mostly clear	5.75°	stopped development

Purge Water Disposal: drums

Comments: \_\_\_\_\_

Field Personnel Signature: 

## WELL DEVELOPMENT LOG

Project Name: KSES  
 Project Number: PN6 0967  
 Site: KSES

Date: 7/29/23  
 Weather: Cloudy 100°  
 Sample Collected by: \_\_\_\_\_

**Well Data**  
 Well I.D.: MW-02  
 Well Diameter (in.): 2 in

Depth to Surface Water (ft): 9.01  
 Well Depth (ft): 15 ft

**Well Purging**  
 Method/Equipment: Surge block/Submersible pump  
 pH/Cond/turb meter ID #: 3098  
 Water Column Length (ft): 5.99

Volume of Water in Well (gal): 1.01 gal  
 Depth of Pump (ft): 14 ft  
 Total Volume Purged (gal): 7.0

Time	Volume Purged	% Fines	pH (pH units)	Cond. (µS/cm)	Turbidity (NTU)	Temp (°C)	Comments
13:20	0.5		6.34	412	<del>(N/A)</del>	9.78	Surge block
13:35	4.0		6.04	313	Cloudy	6.36	Submersible pump
13:38	5.0		<del>5.94</del>	305	Cloudy	5.94	
13:41	7.0		5.88	295	Clear	6.28	done w/ development

Purge Water Disposal: drums

Comments: \_\_\_\_\_

Field Personnel Signature: [Signature]

## WELL DEVELOPMENT LOG

Project Name: KSES  
 Project Number: PMG 09107  
 Site: KSES

Date: 7/29/30  
 Weather: Cloudy 60°  
 Sample Collected by: \_\_\_\_\_

### Well Data

Well I.D.: MW-03  
 Well Diameter (in.): 2 in

Depth to Surface Water (ft): 8.05  
 Well Depth (ft): 15 ft

### Well Purging

Method/Equipment: Surge block submersible pump  
 pH/Cond/turb meter ID #: 13598  
 Water Column Length (ft): 10.35

Volume of Water in Well (gal): ~~0.8~~ 1.07 gal<sup>EB</sup>  
 Depth of Pump (ft): 14 ft  
 Total Volume Purged (gal): 5 gal

Time	Volume Purged	% Fines	pH (pH units)	Cond. (µS/cm)	Turbidity (NTU)	Temp (°C)	Comments
14:07	0.5 gal		6.28	188	extreme	12.49	Surge block
14:14	1.5 gal		6.21	103	extreme	9.70	Submersible pump
14:18	2.0 gal		6.33	151	RTA/pine	7.96	
14:22	2.5 gal		6.12	143	very turbid	8.16	
14:27	3.0 gal		6.03	128	cloudy	7.40	
14:32	3.5 gal		6.03	121	most clear	7.21	
14:37	4.0 gal		5.91	122	clear	8.05	
14:42	4.5 gal		5.91	120	clear	7.12	
14:47	5.0 gal		5.90	117	very clear	7.03	Stopped development

Purge Water Disposal: drum

Comments: \_\_\_\_\_

Field Personnel Signature: [Signature]



## WELL DEVELOPMENT LOG

Project Name: KSES  
 Project Number: PNG0967  
 Site: KSES

Date: 30 July 2023  
 Weather: Partly Cloudy  
 Sample Collected by: M Faust/E Bilsto

**Well Data**  
 Well I.D.: MW-04  
 Well Diameter (in.): 2

Depth to Surface Water (ft): 6.10  
 Well Depth (ft): 9.59

**Well Purging**  
 Method/Equipment: sub pump  
 pH/Cond/turb meter ID #: 3098  
 Water Column Length (ft): 0.593

Volume of Water in Well (gal):  $3.49 \times 0.17 = 0.593$   
 Depth of Pump (ft): 9 ft  
 Total Volume Purged (gal): 5.6 gal  
*5.6 gal*

Time	Volume Purged	% Fines	pH (pH units)	Cond. (µS/cm)	Turbidity (NTU)	Temp (°C)	Comments
5:05	0.5		6.79	170	extreme	8.75	Sub pump only
5:07	1.0		6.73	153	extreme	8.02	
5:09	1.5		6.73	179	extreme	7.64	
5:10	1.75		6.66	125	very cloudy	7.73	
5:11	2.0		6.63	119	very cloudy	7.42	
5:12	2.5		6.62	117	very cloudy	7.37	
5:14	2.75		6.62	115	very cloudy	7.33	
5:15	3		6.63	114	cloudy	7.47	
5:16	3.25		6.63	136	cloudy	7.47	
5:18	3.5		6.70	155	cloudy	7.65	
5:19	3.6		6.69	117	cloudy	7.52	
5:20	3.7		6.63	113	cloudy	7.51	
5:22	3.8		6.62	111	cloudy	7.65	
5:28	4.0		6.43	108	cloudy	7.72	
5:35	4.75		6.50	106	cloudy	7.61	
5:42	5.6		6.45	105	cloudy	7.59	no pet odor

Purge Water Disposal: drums

Comments: \_\_\_\_\_  
 \_\_\_\_\_

Field Personnel Signature: 

## WELL DEVELOPMENT LOG

Project Name: KSES  
 Project Number: PNV60907  
 Site: KSES

Date: 7/30/23  
 Weather: cloudy 50°  
 Sample Collected by: \_\_\_\_\_

### Well Data

Well I.D.: MW-05  
 Well Diameter (in.): 2 in

Depth to Surface Water (ft): 8.61ft  
 Well Depth (ft): 15.1ft

### Well Purging

Method/Equipment: Sub Pump  
 pH/Cond/turb meter ID #: 3098  
 Water Column Length (ft): 6.49ft

Volume of Water in Well (gal): 1.10gal  
 Depth of Pump (ft): 14.5  
 Total Volume Purged (gal): 6 gal

Time	Volume Purged	% Fines	pH (pH units)	Cond. (µS/cm)	Turbidity (NTU)	Temp (°C)	Comments
6:32	1gal		7.11	253	extreme	7.86	
6:34	1.5		7.13	261	extreme	7.88	sheen, pet odor
6:37	2gal		7.10	253	extreme	7.66	pet odor
6:38	2.5		7.02	250	very cloudy	7.86	pet odor
6:41	3gal		6.94	240	cloudy	7.72	"
6:43	4gal		6.85	240	mostly clear	8.12	"
6:45	4.5		6.83	233	mostly clear	7.83	"
6:47	5gal		6.76	230	mostly clear	7.90	"
6:49	6gal		6.73	230	clear	8.09	"

Purge Water Disposal: drums

Comments: \_\_\_\_\_  
 \_\_\_\_\_

Field Personnel Signature: [Signature]



# **APPENDIX E**

## Groundwater Sampling Forms

Project Name: King Salmon Earth Station  
Client: AT&T

Proj. No: PNG0967  
Date: 29 July 2023

Field Personnel: Matt Faust, Emma Bristol DTW (prior to purge): 8.69 ft  
Weather: Cloudy Total Well Depth: ~~15.08~~ 15.08 ft  
Well Condition: Good Water Column Height: 6.39 ft  
Damage?: NO Total Well Volume: 1.08 gal

Pump type: SS Hurricane

Sample Description: \_\_\_\_\_

3

Well Volume Calculation							
Nominal Casing Diameter	1"	1.5"	2"	3"	4"		1 gallon = 3.79 liters
Volume (gallon/linear foot)	0.04	0.11	0.17	0.38	0.66		

Well Purging									
Time	DTW	Pump Rate	Temperature	Specific Conductivity	Dissolved Oxygen	pH	ORP	Turbidity	Total Purged
(3-5 min)	(feet)	(mL/min)	(degree C)	(µS/cm)	(mg/L)	(S.U.)	(mV)	(NTU)	(L)
Stabilization:	0.3 ft	-	3%	3%	10%	0.1 SU	10 mV	10%	3x vol.
15:24	8.88	569	7.85°	427	11.62	5.90	20.8	Janky	0.25
15:29	9.01	569	6.21	375	7.67	5.95	1.2	less cloudy	3.79
15:34	9.04	569	5.77°	376	7.38	5.87	-15.4	less cloudy	5.69
15:39	8.95	568	6.14°	403	6.96	5.85	-16.1	mostly clear	9.48
15:44	8.93	568	6.31°	383	7.18	5.85	-19.6	mostly clear	11.37
15:48								10.9	

0.95  
Turbidimeter began working

Analytical Sample Information		
Sample ID	Time	Analytes/Method
23KSES-MW01-GW	<del>13:50</del> 15:50	PAH, GRO, DRO, P&T-VOCs

4

Well ID: MW-02

Project Name: KSES Proj. No: PN6 0967  
 Client: AT+T Date: 7/29/23

Field Personnel: Emma Bristol, Matt Faust DTW (prior to purge): 9.43 ft  
 Weather: Cloudy 60° Total Well Depth: 15.20 ft  
 Well Condition: Good Water Column Height: 5.93 ft  
 Damage?: NO Total Well Volume: 1.01 gal

Pump type: SS Hurricane  
 Sample Description: \_\_\_\_\_

Well Volume Calculation							
Nominal Casing Diameter	1"	1.5"	2"	3"	4"		
Volume (gallon/linear foot)	0.04	0.11	0.17	0.38	0.66		1 gallon = 3.79 liters

Well Purging									
Time	DTW	Pump Rate	Temperature	Specific Conductivity	Dissolved Oxygen	pH	ORP	Turbidity	Total Purged
(3-5 min)	(feet)	(mL/min)	(degree C)	(µS/cm)	(mg/L)	(S.U.)	(mV)	(NTU)	(L)
Stabilization:	0.3 ft	-	3%	3%	10%	0.4-0.6	10 mV	10%	3x vol.
16:35	9.52	474	9.24	479	12.00	6.16	76.5	cloudy	0.38
16:40	9.53	474	6.68	451	6.83	6.29	30.9	clear	3.79
16:45	9.55	474	6.40	372	7.12	6.19	7.2	clear	7.58
16:48	9.56	474	6.29	353	7.11	6.15	3.3	clear	8.57
16:51	9.56	474	6.37	344	7.13	6.13	0.3		9.48

Analytical Sample Information		
Sample ID	Time	Analytes/Method
23KSES-MW02-GW	16:55	PAH, GRO, PRO, P-VOCs

Well ID: MW-03

Project Name: KSES Proj. No: PN60967

Client: AT&T Date: 7/29/23

Field Personnel: Emma Bristol/Matt Faust DTW (prior to purge): 8.63 ft  
 Weather: Cloudy, 60° Total Well Depth: 14.92 ft  
 Well Condition: good Water Column Height: 6.29 ft  
 Damage?: no Total Well Volume: 1.07 gal

Pump type: SS hurricane

Sample Description: \_\_\_\_\_

Well Volume Calculation									
Nominal Casing Diameter	1"	1.5"	2"	3"	4"	1 gallon = 3.79 liters			
Volume (gallon/linear foot)	0.04	0.11	0.17	0.38	0.66				
Well Purging									
Time	DTW	Pump Rate	Temperature	Specific Conductivity	Dissolved Oxygen	pH	ORP	Turbidity	Total Purged
(3-5 min)	(feet)	(mL/min)	(degree C)	(µS/cm)	(mg/L)	(S.U.)	(mV)	(NTU)	(L)
Stabilization	0.3 ft	-	3%	3%	10%	0.1 SU	10 mV	10%	3x vol.
17:21	9.01		10.49	192	11.50	6.18	17.2	mostly clear	0.15
17:24	8.95		9.03	185	9.33	6.16	-2.7	Mostly clear	0.95
17:27	9.03		8.82	184	8.26	6.12	-9.1	cloudy	1.89
17:30	9.12		8.23	185	7.98	6.13	-18.2	cloudy	3.79
17:33	9.24		7.38	185	7.82	6.13	-21.5	mostly clear	5.69
17:36	9.08		7.34	183	7.45	6.09	-24.1	mostly clear	6.63

0.1  
Pump lowered to 10.5 ft

Analytical Sample Information		
Sample ID	Time	Analytes/Method
23KSES-MW03-6W	17:42	GRD, DRD, PAH, P-VOC



MW-04

Project Name: KSES

Proj. No: PN90967

Client: AT&T

Date: 30 July 2003

Field Personnel: Math Faust / Emma Bristol DTW (prior to purge): 6.1  
 Weather: Partly Clouds Total Well Depth: 9.59  
 Well Condition: Good, new Water Column Height: 3.49  
 Damage?: No Total Well Volume: 0.593 gal

Pump type: JS hurricane

Sample Description:

Well Volume Calculation									
Nominal Casing Diameter	1"	1.5"	2"	3"	4"				
Volume (gallon/linear foot)	0.04	0.11	0.17	0.38	0.66				1 gallon = 3.79 liters
Well Purging									
Time	DTW	Pump Rate	Temperature	Specific Conductivity	Dissolved Oxygen	pH	ORP	Turbidity	Total Purged
(3-5 min)	(feet)	(mL/min)	(degree C)	(µS/cm)	(mg/L)	(S.U.)	(mV)	(NTU)	(L)
Stabilization:	0.3 ft	-	3%	3%	10%	0.180	10 mV	10%	3x vol.
5:53	6.32	505 gal	8.34	159	10.02	6.50	-54.6	Very Cloudy	0.38
5:50	6.54	507 gal	7.01	162	7.85	6.43	-96.5	Cloudy	1.89
5:59	6.55	505 gal	7.28	152	7.86	6.42	-98.8	Mostly Clear	5.69
6:02	6.55	505 gal	7.26	148	8.13	6.43	-95.6	Clear	7.58

Analytical Sample Information		
Sample ID	Time	Analytes/Method
<u>23KSES-MW04 GW</u>	<u>6:04</u>	<u>Org DRO, PAH, Pet Vol</u>



Project Name: KSES Proj. No: PN60967  
 Client: AT & T Date: 7/30/23

Field Personnel: Emma Bristol / Matt Faust DTW (prior to purge): 8.61 ft  
 Weather: Cloudy 50° Total Well Depth: 15.1 ft  
 Well Condition: good Water Column Height: 6.49 ft  
 Damage?: no Total Well Volume: 1.10 gal

Pump type: SS hurricane

Sample Description: \_\_\_\_\_

Well Volume Calculation							
Nominal Casing Diameter	1"	1.5"	2"	3"	4"		
Volume (gallon/linear foot)	0.04	0.11	0.17	0.38	0.66		1 gallon = 3.79 liters

Well Purging									
Time	DTW	Pump Rate	Temperature	Specific Conductivity	Dissolved Oxygen	pH	ORP	Turbidity	Total Purged
(3-5 min)	(feet)	(mL/min)	(degree C)	(µS/cm)	(mg/L)	(S.U.)	(mV)	(NTU)	(L)
Stabilization:	0.3 ft	-	3%	3%	10%	0.1 SU	10 mV	10%	3x vol.
7:05	8.93	354	8.89	334	7.52	6.78	-38.3	very cloudy	.003
7:08	8.97	354	8.91	336	1.82	6.67	-99	very cloudy	0.95
7:11	8.98	354	8.29	345	0.97	6.72	-192.1	cloudy	1.89
7:14	8.95	354	8.29	335	0.49	6.74	-149.9	cloudy	3.79
7:17	8.88	354	8.31	334	0.25	6.74	-156.8	mostly clear	4.25

Analytical Sample Information		
Sample ID	Time	Analytes/Method
<u>23 KSES - MW05 - GW</u>	<u>7.20</u>	<u>GR0, DR0, Pe + VOL, PAH</u>

# **APPENDIX F**

## **Waste Disposal Documentation**





**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
Contaminated Sites and Prevention Preparedness and Response Programs  
Contaminated Media Transport and Treatment or Disposal Approval Form**

<b>HAZARD ID # or SPILL ID #</b>		<b>NAME OF CONTAMINATED SITE OR SPILL</b>	
2819		AT&T Alascom King Salmon Earth Station	
<b>CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION</b>			
Airport Road; Lot 5, Lot 6, and Lot 7, King Salmon Airport, King Salmon, Alaska 99613			
<b>CURRENT PHYSICAL LOCATION OF MEDIA</b>		<b>SOURCE OF THE CONTAMINATION (DAY TANK, FIRE TRAINING PIT, LUST, ETC.)</b>	
Project Site (listed above)		Above Ground Storage Tank piping release	
<b>CONTAMINANTS OF CONCERN</b>	<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>	
DRO	55-gallon drum	28-29 July 2023	
<b>POST TREATMENT ANALYSIS REQUIRED</b> (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)			
Not Applicable			
<b>COMMENTS OR OTHER IMPORTANT INFORMATION</b>			
Two waste characterization samples were collected from the source area in April 2023 and analyzed for DRO, PAHs, GRO, and VOCs. DRO was the only analyte that exceed Method 2 Migration to Groundwater Cleanup Levels, at concentrations up to 3,750 mg/kg (sample ID 23KSES-WASTE02). Summary table and analytical report will be submitted with this request for approval form. Soil cuttings generated at the site during groundwater investigation in July 2023 were characterized using these results. Drum will be transported from the site by US Ecology and ultimately transported to the Roosevelt Regional Landfill in Washington for disposal.			

<b>TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
Roosevelt Regional Municipal Solid Waste Landfill	500 Roosevelt Grade Road, Roosevelt, WA 99356
<b>RESPONSIBLE PARTY</b>	<b>ADDRESS/PHONE NUMBER</b>
AT&T Alaska	505 East Bluff Drive, MP 189, Anchorage, AK / 907-264-7881
<b>WASTE MANAGEMENT CO. / ORGANIZER</b>	<b>ADDRESS/PHONE NUMBER</b>
US Ecology	619 East Ship Creek Avenue, Suite 309

\*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

**Matt Faust**

Name of the Person Requesting Approval (printed)

Signature

Digitally signed by Matt Faust  
Date: 2023.09.26 15:14:12 -08'00'

**Senior Geologist/ Geosyntec Consultants**

Title/Association

26 September 2023

Date

**907-382-3826**

Phone Number

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

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

**Evonne Reese**

DEC Project Manager Name (printed)

Signature

**EPS III**

Project Manager Title

09/26/2023

Date

**907-465-5229**

Phone Number





**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION**  
**DIVISION OF SPILL PREVENTION AND RESPONSE**  
**Contaminated Sites and Prevention Preparedness and Response Programs**  
**Contaminated Media Transport and Treatment or Disposal Approval Form**

<b>HAZARD ID # or SPILL ID #</b>		<b>NAME OF CONTAMINATED SITE OR SPILL</b>	
2819		AT&T Alascom King Salmon Earth Station	
<b>CONTAMINATED SITE OR SPILL LOCATION – ADDRESS OR OTHER APPROPRIATE DESCRIPTION</b>			
Airport Road; Lot 5, Lot 6, and Lot 7, King Salmon Airport, King Salmon, Alaska 99613			
<b>CURRENT PHYSICAL LOCATION OF MEDIA</b>		<b>SOURCE OF THE CONTAMINATION (DAY TANK, FIRE TRAINING PIT, LUST, ETC.)</b>	
Project Site (listed above)		Above Ground Storage Tank piping release; King Salmon Divert (PFAS)	
<b>CONTAMINANTS OF CONCERN</b>		<b>ESTIMATED VOLUME</b>	<b>DATE(S) GENERATED</b>
DRO, PFAS		55-gallon drum	28-31 July 2023
<b>POST TREATMENT ANALYSIS REQUIRED (such as GRO, DRO, RRO, VOCs, metals, PFAS, and/or Chlorinated Solvents)</b>			
DRO, PFAS			
<b>COMMENTS OR OTHER IMPORTANT INFORMATION</b>			
Purge water and decontamination water generated during groundwater investigation in July 2023. Waste is characterized with project samples (for DRO, GRO, PAHs, and VOCs) as well as one waste characterization sample (23KSES-IDW-WA) for PFAS, due to known PFAS presence in groundwater at King Salmon. Tables summarizing characterization results and the analytical report are attached.			

<b>TREATMENT FACILITY, LANDFILL, AND/OR FINAL DESTINATION OF MEDIA</b>	<b>PHYSICAL ADDRESS/PHONE NUMBER</b>
US Ecology	2020 Viking Drive, Anchorage, AK / 907-646-5020
<b>RESPONSIBLE PARTY</b>	<b>ADDRESS/PHONE NUMBER</b>
AT&T Alaska	505 East Bluff Drive, MP 189, Anchorage, AK / 907-264-7881
<b>WASTE MANAGEMENT CO. / ORGANIZER</b>	<b>ADDRESS/PHONE NUMBER</b>
US Ecology	619 East Ship Creek Avenue, Suite 309, Anchorage, AK / 907-646-5020


\*Note, disposal of polluted soil in a landfill requires prior approval from the landfill operator and ADEC Solid Waste Program.

**Matt Faust**  
 Name of the Person Requesting Approval (printed)  
  
 Digitally signed by Matt Faust  
 Date: 2023.09.26 15:08:30 -08'00'  
 Signature

**Senior Geologist/ Geosyntec Consultants**  
 Title/Association  
 26 September 2023  
 Date  
**907-382-3826**  
 Phone Number

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

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

**Evonne Reese**  
 DEC Project Manager Name (printed)  
  
 Signature

**EPS III**  
 Project Manager Title  
 09/26/2023  
 Date  
**907-465-5229**  
 Phone Number



# NON-HAZARDOUS WASTE MANIFEST

191614-MA

Please print or type (Form designed for use on elite (12 pitch) typewriter)

<b>NON-HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. <b>VSQG</b>		Manifest Document No. <b>191614A</b>	2. Page 1 of 1
3. Generator's Name and Mailing Address <b>AT&amp;T SERVICES, INC. 505 EAST BLUFF DRIVE ANCHORAGE, AK 99501</b>			AT&T ALASKA AIRPORT ROAD, LOTS 5,6,7 KING SALMON, AK 99613		<b>IN CASE OF EMERGENCY CALL</b>  <b>600-833-4672</b>
4. Generator's Phone ( <b>907-264-7881</b> )					
5. Transporter 1 Company Name <b>EVERTS AIR CARGO</b>		6. US EPA ID Number <b>AKR000200295</b>		A. State Transporter's ID	
7. Transporter 2 Company Name <b>US ECOLOGY</b>		8. US EPA ID Number <b>MIK593743838</b>		B. Transporter 1 Phone ( <b>907</b> ) <b>534-5100</b>	
9. Designated Facility Name and Site Address <b>US ECOLOGY ALASKA LLC 2020 VIKING DRIVE ANCHORAGE, AK 99501</b>		10. US EPA ID Number <b>AKR000004184</b>		C. State Transporter's ID	
				D. Transporter 2 Phone <b>734-521-6104</b>	
				E. State Facility's ID	
				F. Facility's Phone <b>907-258-1558</b>	
11. WASTE DESCRIPTION			Containers		13. Total Quantity
			No.	Type	14. Unit Wt./Vol.
a. <b>HM</b> MATERIAL NOT REGULATED BY D.O.T.			1	DM	425 P
b. MATERIAL NOT REGULATED BY D.O.T.			1	DM	400 P
c.					
d.					
G. Additional Descriptions for Materials Listed Above 1) EA0707 IDW BORE CUTTINGS 2) EA0319 AFFF 3% FOR SOLIDIFICATION			H. Handling Codes for Wastes Listed Above <b>D51931</b>		
15. Special Handling Instructions and Additional Information Shipper's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation					
<b>16. GENERATOR'S CERTIFICATION:</b> I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.					
Printed/Typed Name <b>ON BEHALF OF A-OT JEFFERSON NIOSH</b>				Signature <i>[Signature]</i> ON BEHALF OF A-OT	
				Date <b>10   17   23</b>	
17. Transporter 1 Acknowledgement of Receipt of Materials					
Printed/Typed Name <b>Zachary Bell</b>				Signature <i>[Signature]</i>	
				Date <b>10   18   2023</b>	
18. Transporter 2 Acknowledgement of Receipt of Materials					
Printed/Typed Name				Signature	
				Date	
19. Discrepancy Indication Space					
20. Facility Owner or Operator: Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.					
Printed/Typed Name				Signature	
				Date	
				Month Day Year	

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

# **APPENDIX G**

## Laboratory Analytical Report



## Laboratory Report of Analysis

To: Geosyntec Consultants  
3003 Minnesota Dr Suite 302  
Anchorage, AK 99503

Report Number: **1233915**

Client Project: **PNG0967 King Salmon Earth Stat**

Dear Matt Faust,

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 Jeremy 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.

---

Jeremy Greth  
Project Manager  
Jeremy.Greth@sgs.com

Date



## Case Narrative

SGS Client: **Geosyntec Consultants**

SGS Project: **1233915**

Project Name/Site: **PNG0967 King Salmon Earth Stat**

Project Contact: **Matt Faust**

Refer to sample receipt form for information on sample condition.

**23KSES-MW01-GW(1233915001BMS) (1233915002) BMS**

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

**23KSES-MW01-GW(1233915001BMSD) (1233915003) BMSD**

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

8270D SIM - PAH BMS/BMSD RPD's for several analytes do not meet QC criteria.

**LCS for HBN 1860866 [XXX/48345 (1726600) LCS**

8270D SIM - PAH LCS recovery for dibenzo[a,h]anthracene does not meet QC criteria.

**LCSD for HBN 1860866 [XXX/4834 (1726601) LCSD**

8270D SIM - PAH LCS/LCSD RPD's for several analytes do not meet QC criteria. The associated sample concentrations for this analyte are less than the LOQ.

**LCSD for HBN 1861472 [VXX/4024 (1727677) LCSD**

8260D - LCS/LCSD RPD for trichlorofluoromethane does not meet QC criteria. This analyte was not reported above LOQ in associated samples.

**LCSD for HBN 1861487 [VXX/4024 (1727751) LCSD**

8260D - LCS/LCSD RPD for Naphthalene does not meet QC criteria. This analyte is not being reported above LOQ in all associated samples.

537M PFAS List 24 were analyzed by SGS of Orlando, FL.

All reported results are final.

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

Print Date: 09/12/2023 8:39:38AM

### Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
<b>8270D SIM LV (PAH)</b>				
1233915008	23KSES-MW06-GW	XMS13831	Acenaphthene	RP
1726599	MB for HBN 1860866 [XXX/48345]	XMS13831	2-Methylnaphthalene	BLC

#### Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

## Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & 17-021 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020B, 7470A, 7471B, 8015C, 8021B, 8082A, 8260D, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). SGS is only certified for the analytes listed on our Drinking Water Certification (DW methods: 200.8, 2130B, 2320B, 2510B, 300.0, 4500-CN-C,E, 4500-H-B, 4500-NO3-F, 4500-P-E and 524.2) and only those analytes will be reported to the State of Alaska for compliance. Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

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

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

### Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
23KSES-MW01-GW	1233915001	07/29/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW01-GW(1233915001	1233915002	07/29/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW01-GW(1233915001	1233915003	07/29/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW02-GW	1233915004	07/29/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW03-GW	1233915005	07/29/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW04-GW	1233915006	07/30/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW05-GW	1233915007	07/30/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-MW06-GW	1233915008	07/30/2023	07/31/2023	Water (Surface, Eff., Ground)
23KSES-SB04-SO-6.5	1233915009	07/28/2023	07/31/2023	Soil/Solid (dry weight)
23KSES-SB041-SO-6.5	1233915010	07/28/2023	07/31/2023	Soil/Solid (dry weight)
23KSES-IDW-WA	1233915011	07/30/2023	07/31/2023	Water (Surface, Eff., Ground)
Trip Blank	1233915012	07/28/2023	07/31/2023	Water (Surface, Eff., Ground)

Method

8270D SIM LV (PAH)  
 AK102  
 AK102  
 AK101  
 SM21 2540G  
 SW8260D

Method Description

8270 PAH SIM GC/MS LV  
 Diesel Range Organics (S)  
 Diesel Range Organics (W)  
 Gasoline Range Organics (W)  
 Percent Solids SM2540G  
 Volatile Organic Compounds (W) FULL



### Detectable Results Summary

Client Sample ID: **23KSES-MW01-GW**

Lab Sample ID: 1233915001

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
2-Methylnaphthalene	0.0225J	ug/L
Fluoranthene	0.0202J	ug/L
Pyrene	0.0205J	ug/L

Client Sample ID: **23KSES-MW02-GW**

Lab Sample ID: 1233915004

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
2-Methylnaphthalene	0.0239J	ug/L
Benzo(a)Anthracene	0.0160J	ug/L
Chrysene	0.0148J	ug/L
Fluoranthene	0.0212J	ug/L
Pyrene	0.0173J	ug/L
Gasoline Range Organics	0.0961J	mg/L

**Volatile Fuels**

Client Sample ID: **23KSES-MW03-GW**

Lab Sample ID: 1233915005

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
2-Methylnaphthalene	0.0250J	ug/L
Benzo(a)Anthracene	0.0167J	ug/L
Chrysene	0.0169J	ug/L
Fluoranthene	0.0165J	ug/L
Pyrene	0.0181J	ug/L
Gasoline Range Organics	0.0811J	mg/L

**Volatile Fuels**

Client Sample ID: **23KSES-MW04-GW**

Lab Sample ID: 1233915006

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
2-Methylnaphthalene	0.0208J	ug/L
Fluoranthene	0.0169J	ug/L
Pyrene	0.0152J	ug/L
Gasoline Range Organics	0.0530J	mg/L

**Volatile Fuels**

Client Sample ID: **23KSES-MW05-GW**

Lab Sample ID: 1233915007

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
2-Methylnaphthalene	0.0254J	ug/L
Acenaphthene	0.142	ug/L
Chrysene	0.0151J	ug/L
Fluoranthene	0.0299J	ug/L
Pyrene	0.0418J	ug/L

**Semivolatile Organic Fuels**

**Volatile Fuels**

Diesel Range Organics	13.8	mg/L
Gasoline Range Organics	0.0810J	mg/L

### Detectable Results Summary

Client Sample ID: **23KSES-MW06-GW**

Lab Sample ID: 1233915008

**Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0582	ug/L
2-Methylnaphthalene	0.0257J	ug/L
Acenaphthene	0.122	ug/L
Fluoranthene	0.0327J	ug/L
Pyrene	0.0381J	ug/L
Diesel Range Organics	10.7	mg/L
Gasoline Range Organics	0.103	mg/L
Toluene	0.310J	ug/L

**Semivolatile Organic Fuels**

**Volatile Fuels**

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

Client Sample ID: **23KSES-SB04-SO-6.5**

Lab Sample ID: 1233915009

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	23.5	mg/kg

Client Sample ID: **23KSES-SB041-SO-6.5**

Lab Sample ID: 1233915010

**Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	22.0	mg/kg



**Results of 23KSES-MW01-GW**

Client Sample ID: **23KSES-MW01-GW**  
 Client Project ID: **PNG0967 King Salmon Earth Stat**  
 Lab Sample ID: 1233915001  
 Lab Project ID: 1233915

Collection Date: 07/29/23 15:50  
 Received Date: 07/31/23 12:08  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
2-Methylnaphthalene	0.0225	J	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Acenaphthene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Acenaphthylene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Anthracene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Benzo(a)Anthracene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Benzo[a]pyrene	0.0104	U	0.0208	0.00646	0.0104	ug/L	1		08/05/23 21:49
Benzo[b]Fluoranthene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Benzo[g,h,i]perylene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Benzo[k]fluoranthene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Chrysene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Dibenzo[a,h]anthracene	0.0104	U	0.0208	0.00646	0.0104	ug/L	1		08/05/23 21:49
Fluoranthene	0.0202	J	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Fluorene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Indeno[1,2,3-c,d] pyrene	0.0261	U	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
Naphthalene	0.0520	U	0.104	0.0323	0.0520	ug/L	1		08/05/23 21:49
Phenanthrene	0.0520	U	0.104	0.0323	0.0520	ug/L	1		08/05/23 21:49
Pyrene	0.0205	J	0.0521	0.0156	0.0261	ug/L	1		08/05/23 21:49
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	71.5		38-100			%	1		08/05/23 21:49
Fluoranthene-d10 (surr)	72.3		30-111			%	1		08/05/23 21:49

**Batch Information**

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: HMW  
 Analytical Date/Time: 08/05/23 21:49  
 Container ID: 1233915001-I

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 08/04/23 07:15  
 Prep Initial Wt./Vol.: 240 mL  
 Prep Extract Vol: 1 mL



Results of **23KSES-MW01-GW**

Client Sample ID: **23KSES-MW01-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915001  
Lab Project ID: 1233915

Collection Date: 07/29/23 15:50  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.330	U	0.659	0.220	0.330	mg/L	1		08/27/23 00:00
<b>Surrogates</b>									
5a Androstane (surr)	85		50-150			%	1		08/27/23 00:00

**Batch Information**

Analytical Batch: XFC16627  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/27/23 00:00  
Container ID: 1233915001-G

Prep Batch: XXX48384  
Prep Method: SW3520C  
Prep Date/Time: 08/10/23 15:20  
Prep Initial Wt./Vol.: 910 mL  
Prep Extract Vol: 1 mL





Results of **23KSES-MW01-GW**

Client Sample ID: **23KSES-MW01-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915001  
Lab Project ID: 1233915

Collection Date: 07/29/23 15:50  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500	U	0.100	0.0450	0.0500	mg/L	1		08/10/23 15:52
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	93.8		50-150			%	1		08/10/23 15:52

**Batch Information**

Analytical Batch: VFC16557  
Analytical Method: AK101  
Analyst: CWD  
Analytical Date/Time: 08/10/23 15:52  
Container ID: 1233915001-D

Prep Batch: VXX40251  
Prep Method: SW5030B  
Prep Date/Time: 08/10/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 23KSES-MW01-GW

Client Sample ID: 23KSES-MW01-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915001
Lab Project ID: 1233915

Collection Date: 07/29/23 15:50
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Lists various petroleum VOCs like 1,2,4-Trimethylbenzene, Benzene, Toluene, etc.

Surrogates

Table with 6 columns: Surrogate Name, Result, Qual, LOQ/CL, Units, DF, Date Analyzed. Lists 1,2-Dichloroethane-D4, 4-Bromofluorobenzene, Toluene-d8.

Batch Information

Analytical Batch: VMS22645
Analytical Method: SW8260D
Analyst: JY
Analytical Date/Time: 08/08/23 15:39
Container ID: 1233915001-A

Prep Batch: VXX40240
Prep Method: SW5030B
Prep Date/Time: 08/08/23 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



**Results of 23KSES-MW02-GW**

Client Sample ID: **23KSES-MW02-GW**  
 Client Project ID: **PNG0967 King Salmon Earth Stat**  
 Lab Sample ID: 1233915004  
 Lab Project ID: 1233915

Collection Date: 07/29/23 16:55  
 Received Date: 07/31/23 12:08  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
2-Methylnaphthalene	0.0239	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Acenaphthene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Acenaphthylene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Anthracene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Benzo(a)Anthracene	0.0160	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	0.00980	ug/L	1		08/05/23 22:37
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Chrysene	0.0148	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	0.00980	ug/L	1		08/05/23 22:37
Fluoranthene	0.0212	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Fluorene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
Naphthalene	0.0490	U	0.0980	0.0304	0.0490	ug/L	1		08/05/23 22:37
Phenanthrene	0.0490	U	0.0980	0.0304	0.0490	ug/L	1		08/05/23 22:37
Pyrene	0.0173	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 22:37
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	84.4		38-100			%	1		08/05/23 22:37
Fluoranthene-d10 (surr)	87.5		30-111			%	1		08/05/23 22:37

**Batch Information**

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: HMW  
 Analytical Date/Time: 08/05/23 22:37  
 Container ID: 1233915004-I

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 08/04/23 07:15  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL



Results of **23KSES-MW02-GW**

Client Sample ID: **23KSES-MW02-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915004  
Lab Project ID: 1233915

Collection Date: 07/29/23 16:55  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.306	U	0.612	0.204	0.306	mg/L	1		08/27/23 00:31
<b>Surrogates</b>									
5a Androstane (surr)	95.8		50-150			%	1		08/27/23 00:31

**Batch Information**

Analytical Batch: XFC16627  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/27/23 00:31  
Container ID: 1233915004-G

Prep Batch: XXX48384  
Prep Method: SW3520C  
Prep Date/Time: 08/10/23 15:20  
Prep Initial Wt./Vol.: 980 mL  
Prep Extract Vol: 1 mL





Results of **23KSES-MW02-GW**

Client Sample ID: **23KSES-MW02-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915004  
Lab Project ID: 1233915

Collection Date: 07/29/23 16:55  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0961	J	0.100	0.0450	0.0500	mg/L	1		08/11/23 20:33
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	99.2		50-150			%	1		08/11/23 20:33

**Batch Information**

Analytical Batch: VFC16559  
Analytical Method: AK101  
Analyst: CWD  
Analytical Date/Time: 08/11/23 20:33  
Container ID: 1233915004-E

Prep Batch: VXX40255  
Prep Method: SW5030B  
Prep Date/Time: 08/11/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 23KSES-MW02-GW

Client Sample ID: 23KSES-MW02-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915004
Lab Project ID: 1233915

Collection Date: 07/29/23 16:55
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2,4-Trimethylbenzene, 1,2-Dibromoethane, 1,2-Dichloroethane, 1,3,5-Trimethylbenzene, Benzene, Cyclohexane, Ethylbenzene, Isopropylbenzene (Cumene), Methyl-t-butyl ether, Naphthalene, n-Butylbenzene, n-hexane, n-Propylbenzene, o-Xylene, P & M -Xylene, sec-Butylbenzene, tert-Butylbenzene, Toluene, Xylenes (total).

Surrogates

Table with 6 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2-Dichloroethane-D4 (surr), 4-Bromofluorobenzene (surr), Toluene-d8 (surr).

Batch Information

Analytical Batch: VMS22645
Analytical Method: SW8260D
Analyst: JY
Analytical Date/Time: 08/08/23 15:54
Container ID: 1233915004-A

Prep Batch: VXX40240
Prep Method: SW5030B
Prep Date/Time: 08/08/23 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



**Results of 23KSES-MW03-GW**

Client Sample ID: **23KSES-MW03-GW**  
 Client Project ID: **PNG0967 King Salmon Earth Stat**  
 Lab Sample ID: 1233915005  
 Lab Project ID: 1233915

Collection Date: 07/29/23 17:42  
 Received Date: 07/31/23 12:08  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
2-Methylnaphthalene	0.0250	J	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Acenaphthene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Acenaphthylene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Anthracene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Benzo(a)Anthracene	0.0167	J	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Benzo[a]pyrene	0.0102	U	0.0204	0.00633	0.0102	ug/L	1		08/05/23 22:54
Benzo[b]Fluoranthene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Benzo[g,h,i]perylene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Benzo[k]fluoranthene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Chrysene	0.0169	J	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Dibenzo[a,h]anthracene	0.0102	U	0.0204	0.00633	0.0102	ug/L	1		08/05/23 22:54
Fluoranthene	0.0165	J	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Fluorene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Indeno[1,2,3-c,d] pyrene	0.0255	U	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
Naphthalene	0.0510	U	0.102	0.0316	0.0510	ug/L	1		08/05/23 22:54
Phenanthrene	0.0510	U	0.102	0.0316	0.0510	ug/L	1		08/05/23 22:54
Pyrene	0.0181	J	0.0510	0.0153	0.0255	ug/L	1		08/05/23 22:54
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	83.8		38-100			%	1		08/05/23 22:54
Fluoranthene-d10 (surr)	85.5		30-111			%	1		08/05/23 22:54

**Batch Information**

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: HMW  
 Analytical Date/Time: 08/05/23 22:54  
 Container ID: 1233915005-I

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 08/04/23 07:15  
 Prep Initial Wt./Vol.: 245 mL  
 Prep Extract Vol: 1 mL



Results of **23KSES-MW03-GW**

Client Sample ID: **23KSES-MW03-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915005  
Lab Project ID: 1233915

Collection Date: 07/29/23 17:42  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.330	U	0.659	0.220	0.330	mg/L	1		08/27/23 00:41
<b>Surrogates</b>									
5a Androstane (surr)	92.3		50-150			%	1		08/27/23 00:41

**Batch Information**

Analytical Batch: XFC16627  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/27/23 00:41  
Container ID: 1233915005-G

Prep Batch: XXX48384  
Prep Method: SW3520C  
Prep Date/Time: 08/10/23 15:20  
Prep Initial Wt./Vol.: 910 mL  
Prep Extract Vol: 1 mL





Results of **23KSES-MW03-GW**

Client Sample ID: **23KSES-MW03-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915005  
Lab Project ID: 1233915

Collection Date: 07/29/23 17:42  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0811	J	0.100	0.0450	0.0500	mg/L	1		08/10/23 18:36
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	98.7		50-150			%	1		08/10/23 18:36

**Batch Information**

Analytical Batch: VFC16557  
Analytical Method: AK101  
Analyst: CWD  
Analytical Date/Time: 08/10/23 18:36  
Container ID: 1233915005-D

Prep Batch: VXX40251  
Prep Method: SW5030B  
Prep Date/Time: 08/10/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 23KSES-MW03-GW

Client Sample ID: 23KSES-MW03-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915005
Lab Project ID: 1233915

Collection Date: 07/29/23 17:42
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2,4-Trimethylbenzene, 1,2-Dibromoethane, 1,2-Dichloroethane, 1,3,5-Trimethylbenzene, Benzene, Cyclohexane, Ethylbenzene, Isopropylbenzene (Cumene), Methyl-t-butyl ether, Naphthalene, n-Butylbenzene, n-hexane, n-Propylbenzene, o-Xylene, P & M -Xylene, sec-Butylbenzene, tert-Butylbenzene, Toluene, Xylenes (total).

Surrogates

Table with 6 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Rows include 1,2-Dichloroethane-D4 (surr), 4-Bromofluorobenzene (surr), Toluene-d8 (surr).

Batch Information

Analytical Batch: VMS22645
Analytical Method: SW8260D
Analyst: JY
Analytical Date/Time: 08/08/23 16:08
Container ID: 1233915005-A

Prep Batch: VXX40240
Prep Method: SW5030B
Prep Date/Time: 08/08/23 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



**Results of 23KSES-MW04-GW**

Client Sample ID: **23KSES-MW04-GW**  
 Client Project ID: **PNG0967 King Salmon Earth Stat**  
 Lab Sample ID: 1233915006  
 Lab Project ID: 1233915

Collection Date: 07/30/23 06:04  
 Received Date: 07/31/23 12:08  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
2-Methylnaphthalene	0.0208	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Acenaphthene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Acenaphthylene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Anthracene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Benzo(a)Anthracene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Benzo[a]pyrene	0.00980	U	0.0196	0.00608	0.00980	ug/L	1		08/05/23 23:10
Benzo[b]Fluoranthene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Benzo[g,h,i]perylene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Benzo[k]fluoranthene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Chrysene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Dibenzo[a,h]anthracene	0.00980	U	0.0196	0.00608	0.00980	ug/L	1		08/05/23 23:10
Fluoranthene	0.0169	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Fluorene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Indeno[1,2,3-c,d] pyrene	0.0245	U	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
Naphthalene	0.0490	U	0.0980	0.0304	0.0490	ug/L	1		08/05/23 23:10
Phenanthrene	0.0490	U	0.0980	0.0304	0.0490	ug/L	1		08/05/23 23:10
Pyrene	0.0152	J	0.0490	0.0147	0.0245	ug/L	1		08/05/23 23:10
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	75.8		38-100			%	1		08/05/23 23:10
Fluoranthene-d10 (surr)	77.2		30-111			%	1		08/05/23 23:10

**Batch Information**

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: HMW  
 Analytical Date/Time: 08/05/23 23:10  
 Container ID: 1233915006-I

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 08/04/23 07:15  
 Prep Initial Wt./Vol.: 255 mL  
 Prep Extract Vol: 1 mL



Results of **23KSES-MW04-GW**

Client Sample ID: **23KSES-MW04-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915006  
Lab Project ID: 1233915

Collection Date: 07/30/23 06:04  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.306	U	0.612	0.204	0.306	mg/L	1		08/27/23 00:51
<b>Surrogates</b>									
5a Androstane (surr)	88.7		50-150			%	1		08/27/23 00:51

**Batch Information**

Analytical Batch: XFC16627  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/27/23 00:51  
Container ID: 1233915006-G

Prep Batch: XXX48384  
Prep Method: SW3520C  
Prep Date/Time: 08/10/23 15:20  
Prep Initial Wt./Vol.: 980 mL  
Prep Extract Vol: 1 mL





Results of 23KSES-MW04-GW

Client Sample ID: 23KSES-MW04-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915006
Lab Project ID: 1233915

Collection Date: 07/30/23 06:04
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile Fuels

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and Surrogates (4-Bromofluorobenzene (surr)).

Batch Information

Analytical Batch: VFC16557
Analytical Method: AK101
Analyst: CWD
Analytical Date/Time: 08/10/23 18:55
Container ID: 1233915006-D
Prep Batch: VXX40251
Prep Method: SW5030B
Prep Date/Time: 08/10/23 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 23KSES-MW04-GW

Client Sample ID: 23KSES-MW04-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915006
Lab Project ID: 1233915

Collection Date: 07/30/23 06:04
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Lists various petroleum VOCs like 1,2,4-Trimethylbenzene, Benzene, Toluene, etc.

Surrogates

Table with 6 columns: Surrogate Name, Result, Qual, LOQ/CL, Units, DF, Date Analyzed. Lists 1,2-Dichloroethane-D4, 4-Bromofluorobenzene, Toluene-d8.

Batch Information

Analytical Batch: VMS22645
Analytical Method: SW8260D
Analyst: JY
Analytical Date/Time: 08/08/23 16:23
Container ID: 1233915006-A

Prep Batch: VXX40240
Prep Method: SW5030B
Prep Date/Time: 08/08/23 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Results of 23KSES-MW05-GW

Client Sample ID: 23KSES-MW05-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915007
Lab Project ID: 1233915

Collection Date: 07/30/23 07:20
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Polynuclear Aromatics GC/MS

Table with columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their surrogate compounds with associated values and detection limits.

Batch Information

Analytical Batch: XMS13831
Analytical Method: 8270D SIM LV (PAH)
Analyst: HMW
Analytical Date/Time: 08/05/23 23:26
Container ID: 1233915007-I

Prep Batch: XXX48345
Prep Method: SW3520C
Prep Date/Time: 08/04/23 07:15
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL



Results of 23KSES-MW05-GW

Client Sample ID: 23KSES-MW05-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915007
Lab Project ID: 1233915

Collection Date: 07/30/23 07:20
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Semivolatile Organic Fuels

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Rows include Diesel Range Organics and Surrogates (5a Androstane).

Batch Information

Analytical Batch: XFC16627
Analytical Method: AK102
Analyst: T.L
Analytical Date/Time: 08/27/23 01:02
Container ID: 1233915007-G

Prep Batch: XXX48384
Prep Method: SW3520C
Prep Date/Time: 08/10/23 15:20
Prep Initial Wt./Vol.: 980 mL
Prep Extract Vol: 1 mL





Results of **23KSES-MW05-GW**

Client Sample ID: **23KSES-MW05-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915007  
Lab Project ID: 1233915

Collection Date: 07/30/23 07:20  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0810	J	0.100	0.0450	0.0500	mg/L	1		08/10/23 19:13
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	96.5		50-150			%	1		08/10/23 19:13

**Batch Information**

Analytical Batch: VFC16557  
Analytical Method: AK101  
Analyst: CWD  
Analytical Date/Time: 08/10/23 19:13  
Container ID: 1233915007-D

Prep Batch: VXX40251  
Prep Method: SW5030B  
Prep Date/Time: 08/10/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



Results of 23KSES-MW05-GW

Client Sample ID: 23KSES-MW05-GW
Client Project ID: PNG0967 King Salmon Earth Stat
Lab Sample ID: 1233915007
Lab Project ID: 1233915

Collection Date: 07/30/23 07:20
Received Date: 07/31/23 12:08
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by Volatile GC/MS- Petroleum VOC Group

Table with 9 columns: Parameter, Result, Qual, LOQ/CL, DL, LOD, Units, DF, Allowable Limits, Date Analyzed. Lists various petroleum VOCs like 1,2,4-Trimethylbenzene, Benzene, Toluene, etc.

Surrogates

Table with 6 columns: Surrogate Name, Result, Qual, LOQ/CL, Units, DF, Date Analyzed. Lists 1,2-Dichloroethane-D4, 4-Bromofluorobenzene, and Toluene-d8.

Batch Information

Analytical Batch: VMS22645
Analytical Method: SW8260D
Analyst: JY
Analytical Date/Time: 08/08/23 16:38
Container ID: 1233915007-A

Prep Batch: VXX40240
Prep Method: SW5030B
Prep Date/Time: 08/08/23 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



**Results of 23KSES-MW06-GW**

Client Sample ID: **23KSES-MW06-GW**  
 Client Project ID: **PNG0967 King Salmon Earth Stat**  
 Lab Sample ID: 1233915008  
 Lab Project ID: 1233915

Collection Date: 07/30/23 08:00  
 Received Date: 07/31/23 12:08  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

**Results by Polynuclear Aromatics GC/MS**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1-Methylnaphthalene	0.0582		0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
2-Methylnaphthalene	0.0257	J	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Acenaphthene	0.122		0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Acenaphthylene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Anthracene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Benzo(a)Anthracene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Benzo[a]pyrene	0.0100	U	0.0200	0.00620	0.0100	ug/L	1		08/05/23 23:42
Benzo[b]Fluoranthene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Benzo[g,h,i]perylene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Benzo[k]fluoranthene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Chrysene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Dibenzo[a,h]anthracene	0.0100	U	0.0200	0.00620	0.0100	ug/L	1		08/05/23 23:42
Fluoranthene	0.0327	J	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Fluorene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Indeno[1,2,3-c,d] pyrene	0.0250	U	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
Naphthalene	0.0500	U	0.100	0.0310	0.0500	ug/L	1		08/05/23 23:42
Phenanthrene	0.0500	U	0.100	0.0310	0.0500	ug/L	1		08/05/23 23:42
Pyrene	0.0381	J	0.0500	0.0150	0.0250	ug/L	1		08/05/23 23:42
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	56.2		38-100			%	1		08/05/23 23:42
Fluoranthene-d10 (surr)	65.6		30-111			%	1		08/05/23 23:42

**Batch Information**

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Analyst: HMW  
 Analytical Date/Time: 08/05/23 23:42  
 Container ID: 1233915008-I

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 08/04/23 07:15  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL



Results of **23KSES-MW06-GW**

Client Sample ID: **23KSES-MW06-GW**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915008  
Lab Project ID: 1233915

Collection Date: 07/30/23 08:00  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	10.7		0.652	0.217	0.326	mg/L	1		08/27/23 01:12
<b>Surrogates</b>									
5a Androstane (surr)	92.5		50-150			%	1		08/27/23 01:12

**Batch Information**

Analytical Batch: XFC16627  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/27/23 01:12  
Container ID: 1233915008-G

Prep Batch: XXX48384  
Prep Method: SW3520C  
Prep Date/Time: 08/10/23 15:20  
Prep Initial Wt./Vol.: 920 mL  
Prep Extract Vol: 1 mL





Results of 23KSES-MW06-GW

Client Sample ID: 23KSES-MW06-GW  
Client Project ID: PNG0967 King Salmon Earth Stat  
Lab Sample ID: 1233915008  
Lab Project ID: 1233915

Collection Date: 07/30/23 08:00  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.103		0.100	0.0450	0.0500	mg/L	1		08/10/23 19:31
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	96.5		50-150			%	1		08/10/23 19:31

Batch Information

Analytical Batch: VFC16557  
Analytical Method: AK101  
Analyst: CWD  
Analytical Date/Time: 08/10/23 19:31  
Container ID: 1233915008-D

Prep Batch: VXX40251  
Prep Method: SW5030B  
Prep Date/Time: 08/10/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of 23KSES-MW06-GW**

Client Sample ID: **23KSES-MW06-GW**  
 Client Project ID: **PNG0967 King Salmon Earth Stat**  
 Lab Sample ID: 1233915008  
 Lab Project ID: 1233915

Collection Date: 07/30/23 08:00  
 Received Date: 07/31/23 12:08  
 Matrix: Water (Surface, Eff., Ground)  
 Solids (%):  
 Location:

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

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	0.0375	ug/L	1		08/08/23 16:53
1,2-Dichloroethane	0.250	U	0.500	0.200	0.250	ug/L	1		08/08/23 16:53
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
Benzene	0.200	U	0.400	0.120	0.200	ug/L	1		08/08/23 16:53
Cyclohexane	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
Ethylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
Methyl-t-butyl ether	5.00	U	10.0	3.10	5.00	ug/L	1		08/08/23 16:53
Naphthalene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
n-Butylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
n-hexane	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
n-Propylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
o-Xylene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
P & M -Xylene	1.00	U	2.00	0.620	1.00	ug/L	1		08/08/23 16:53
sec-Butylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
tert-Butylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
Toluene	0.310	J	1.00	0.310	0.500	ug/L	1		08/08/23 16:53
Xylenes (total)	1.50	U	3.00	1.00	1.50	ug/L	1		08/08/23 16:53

**Surrogates**

1,2-Dichloroethane-D4 (surr)	111		81-118			%	1		08/08/23 16:53
4-Bromofluorobenzene (surr)	97.9		85-114			%	1		08/08/23 16:53
Toluene-d8 (surr)	96.6		89-112			%	1		08/08/23 16:53

**Batch Information**

Analytical Batch: VMS22645  
 Analytical Method: SW8260D  
 Analyst: JY  
 Analytical Date/Time: 08/08/23 16:53  
 Container ID: 1233915008-A

Prep Batch: VXX40240  
 Prep Method: SW5030B  
 Prep Date/Time: 08/08/23 06:00  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL



Results of **23KSES-SB04-SO-6.5**

Client Sample ID: **23KSES-SB04-SO-6.5**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915009  
Lab Project ID: 1233915

Collection Date: 07/28/23 14:50  
Received Date: 07/31/23 12:08  
Matrix: Soil/Solid (dry weight)  
Solids (%):92.2  
Location:

Results by **Semivolatile Organic Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	23.5		21.2	9.56	10.6	mg/kg	1		08/06/23 02:29
<b>Surrogates</b>									
5a Androstane (surr)	82.9		50-150			%	1		08/06/23 02:29

**Batch Information**

Analytical Batch: XFC16595  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/06/23 02:29  
Container ID: 1233915009-A

Prep Batch: XXX48326  
Prep Method: SW3550C  
Prep Date/Time: 08/02/23 07:43  
Prep Initial Wt./Vol.: 22.989 g  
Prep Extract Vol: 5 mL



Results of 23KSES-SB041-SO-6.5

Client Sample ID: 23KSES-SB041-SO-6.5  
Client Project ID: PNG0967 King Salmon Earth Stat  
Lab Sample ID: 1233915010  
Lab Project ID: 1233915

Collection Date: 07/28/23 15:30  
Received Date: 07/31/23 12:08  
Matrix: Soil/Solid (dry weight)  
Solids (%):92.6  
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	22.0		21.2	9.52	10.6	mg/kg	1		08/06/23 02:39
<b>Surrogates</b>									
5a Androstane (surr)	80.8		50-150			%	1		08/06/23 02:39

Batch Information

Analytical Batch: XFC16595  
Analytical Method: AK102  
Analyst: T.L  
Analytical Date/Time: 08/06/23 02:39  
Container ID: 1233915010-A

Prep Batch: XXX48326  
Prep Method: SW3550C  
Prep Date/Time: 08/02/23 07:43  
Prep Initial Wt./Vol.: 22.963 g  
Prep Extract Vol: 5 mL





**Results of Trip Blank**

Client Sample ID: **Trip Blank**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915012  
Lab Project ID: 1233915

Collection Date: 07/28/23 00:00  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

**Results by Volatile Fuels**

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	0.0500	U	0.100	0.0450	0.0500	mg/L	1		08/09/23 19:54
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	96.1		50-150			%	1		08/09/23 19:54

**Batch Information**

Analytical Batch: VFC16556  
Analytical Method: AK101  
Analyst: CWD  
Analytical Date/Time: 08/09/23 19:54  
Container ID: 1233915012-C

Prep Batch: VXX40249  
Prep Method: SW5030B  
Prep Date/Time: 08/09/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Results of Trip Blank**

Client Sample ID: **Trip Blank**  
Client Project ID: **PNG0967 King Salmon Earth Stat**  
Lab Sample ID: 1233915012  
Lab Project ID: 1233915

Collection Date: 07/28/23 00:00  
Received Date: 07/31/23 12:08  
Matrix: Water (Surface, Eff., Ground)  
Solids (%):  
Location:

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

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	0.0375	ug/L	1		08/08/23 16:19
1,2-Dichloroethane	0.250	U	0.500	0.200	0.250	ug/L	1		08/08/23 16:19
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
Benzene	0.200	U	0.400	0.120	0.200	ug/L	1		08/08/23 16:19
Cyclohexane	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
Ethylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
Methyl-t-butyl ether	5.00	U	10.0	3.10	5.00	ug/L	1		08/08/23 16:19
Naphthalene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
n-Butylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
n-hexane	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
n-Propylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
o-Xylene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
P & M -Xylene	1.00	U	2.00	0.620	1.00	ug/L	1		08/08/23 16:19
sec-Butylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
tert-Butylbenzene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
Toluene	0.500	U	1.00	0.310	0.500	ug/L	1		08/08/23 16:19
Xylenes (total)	1.50	U	3.00	1.00	1.50	ug/L	1		08/08/23 16:19

**Surrogates**

1,2-Dichloroethane-D4 (surr)	105		81-118			%	1		08/08/23 16:19
4-Bromofluorobenzene (surr)	104		85-114			%	1		08/08/23 16:19
Toluene-d8 (surr)	102		89-112			%	1		08/08/23 16:19

**Batch Information**

Analytical Batch: VMS22646  
Analytical Method: SW8260D  
Analyst: PHK  
Analytical Date/Time: 08/08/23 16:19  
Container ID: 1233915012-A

Prep Batch: VXX40241  
Prep Method: SW5030B  
Prep Date/Time: 08/08/23 06:00  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL



**Method Blank**

Blank ID: MB for HBN 1860644 [SPT/11857]

Blank Lab ID: 1726254

QC for Samples:

1233915009, 1233915010

Matrix: Soil/Solid (dry weight)

**Results by SM21 2540G**

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

**Batch Information**

Analytical Batch: SPT11857

Analytical Method: SM21 2540G

Instrument:

Analyst: APS

Analytical Date/Time: 8/1/2023 6:00:00PM

Print Date: 09/12/2023 8:39:50AM

## Duplicate Sample Summary

Original Sample ID: 1233915009

Duplicate Sample ID: 1726255

QC for Samples:

1233915009, 1233915010

Analysis Date: 08/01/2023 18:00

Matrix: Soil/Solid (dry weight)

## Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	92.2	92.9	%	0.79	(< 15 )

## Batch Information

Analytical Batch: SPT11857

Analytical Method: SM21 2540G

Instrument:

Analyst: APS

Print Date: 09/12/2023 8:39:52AM



## Duplicate Sample Summary

Original Sample ID: 1233916005

Duplicate Sample ID: 1726256

QC for Samples:

1233915010

Analysis Date: 08/01/2023 18:00

Matrix: Soil/Solid (dry weight)

## Results by SM21 2540G

<u>NAME</u>	<u>Original</u>	<u>Duplicate</u>	<u>Units</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	94.4	95.3	%	0.94	(< 15 )

## Batch Information

Analytical Batch: SPT11857

Analytical Method: SM21 2540G

Instrument:

Analyst: APS

Print Date: 09/12/2023 8:39:52AM

## Method Blank

Blank ID: MB for HBN 1861472 [VXX/40240]  
 Blank Lab ID: 1727675

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
 1233915001, 1233915004, 1233915005, 1233915006, 1233915007, 1233915008

## Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	0.500	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	0.0375	ug/L
1,2-Dichloroethane	0.250U	0.500	0.200	0.250	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	0.500	ug/L
Benzene	0.200U	0.400	0.120	0.200	ug/L
Cyclohexane	0.500U	1.00	0.310	0.500	ug/L
Ethylbenzene	0.500U	1.00	0.310	0.500	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	0.500	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	5.00	ug/L
Naphthalene	0.500U	1.00	0.310	0.500	ug/L
n-Butylbenzene	0.500U	1.00	0.310	0.500	ug/L
n-hexane	0.500U	1.00	0.310	0.500	ug/L
n-Propylbenzene	0.500U	1.00	0.310	0.500	ug/L
o-Xylene	0.500U	1.00	0.310	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.620	1.00	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	0.500	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	0.500	ug/L
Toluene	0.500U	1.00	0.310	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.00	1.50	ug/L

## Surrogates

1,2-Dichloroethane-D4 (surr)	109	81-118	0	%
4-Bromofluorobenzene (surr)	99.9	85-114	0	%
Toluene-d8 (surr)	96.6	89-112	0	%

## Batch Information

Analytical Batch: VMS22645  
 Analytical Method: SW8260D  
 Instrument: VPA 780/5975 GC/MS  
 Analyst: JY  
 Analytical Date/Time: 8/8/2023 1:17:00PM

Prep Batch: VXX40240  
 Prep Method: SW5030B  
 Prep Date/Time: 8/8/2023 6:00:00AM  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [VXX40240]  
 Blank Spike Lab ID: 1727676  
 Date Analyzed: 08/08/2023 13:32

Spike Duplicate ID: LCSD for HBN 1233915 [VXX40240]  
 Spike Duplicate Lab ID: 1727677  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915001, 1233915004, 1233915005, 1233915006, 1233915007, 1233915008

## Results by SW8260D

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	30	31.8	106	30	28.1	94	( 79-124 )	12.50	(< 20 )
1,2-Dibromoethane	30	28.6	95	30	27.7	92	( 77-121 )	3.40	(< 20 )
1,2-Dichloroethane	30	31.2	104	30	29.5	98	( 73-128 )	5.70	(< 20 )
1,3,5-Trimethylbenzene	30	32.0	107	30	27.6	92	( 75-124 )	14.70	(< 20 )
Benzene	30	31.4	105	30	28.4	95	( 79-120 )	9.80	(< 20 )
Cyclohexane	30	31.7	106	30	27.7	92	( 70-130 )	13.60	(< 20 )
Ethylbenzene	30	31.8	106	30	28.5	95	( 79-121 )	11.10	(< 20 )
Isopropylbenzene (Cumene)	30	32.5	108	30	29.0	97	( 72-131 )	11.40	(< 20 )
Methyl-t-butyl ether	45	48.4	108	45	46.8	104	( 71-124 )	3.30	(< 20 )
Naphthalene	30	30.5	102	30	28.5	95	( 61-128 )	7.10	(< 20 )
n-Butylbenzene	30	31.1	104	30	27.4	91	( 75-128 )	12.70	(< 20 )
n-hexane	30	28.5	95	30	24.9	83	( 70-130 )	13.60	(< 20 )
n-Propylbenzene	30	31.8	106	30	27.2	91	( 76-126 )	15.60	(< 20 )
o-Xylene	30	31.3	104	30	28.2	94	( 78-122 )	10.70	(< 20 )
P & M -Xylene	60	62.7	105	60	56.1	94	( 80-121 )	11.10	(< 20 )
sec-Butylbenzene	30	31.7	106	30	27.3	91	( 77-126 )	14.90	(< 20 )
tert-Butylbenzene	30	31.1	104	30	26.6	89	( 78-124 )	15.50	(< 20 )
Toluene	30	28.1	94	30	25.4	85	( 80-121 )	9.90	(< 20 )
Xylenes (total)	90	94.1	105	90	84.3	94	( 79-121 )	11.00	(< 20 )

## Surrogates

1,2-Dichloroethane-D4 (surr)	30		101	30		104	( 81-118 )	3.00	
4-Bromofluorobenzene (surr)	30		98	30		96	( 85-114 )	1.90	
Toluene-d8 (surr)	30		100	30		100	( 89-112 )	0.17	

## Batch Information

Analytical Batch: **VMS22645**  
 Analytical Method: **SW8260D**  
 Instrument: **VPA 780/5975 GC/MS**  
 Analyst: **JY**

Prep Batch: **VXX40240**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/08/2023 06:00**  
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL



### Billable Matrix Spike Summary

Original Sample ID: 1233915001  
 MS Sample ID: 1233915002 BMS  
 MSD Sample ID: 1233915003 BMSD

Analysis Date: 08/08/2023 15:39  
 Analysis Date: 08/08/2023 21:36  
 Analysis Date: 08/08/2023 21:50  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

### Results by SW8260D

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	0.500U	30.0	29.4	98	30.0	29.3	98	79-124	0.34	(< 20)
1,2-Dibromoethane	0.0375U	30.0	29.6	99	30.0	27.0	90	77-121	9.00	(< 20)
1,2-Dichloroethane	0.250U	30.0	32.7	109	30.0	30.6	102	73-128	6.70	(< 20)
1,3,5-Trimethylbenzene	0.500U	30.0	29.5	98	30.0	29.1	97	75-124	1.20	(< 20)
Benzene	0.200U	30.0	30.9	103	30.0	29.5	99	79-120	4.40	(< 20)
Cyclohexane	0.500U	30.0	30	100	30.0	30.7	102	70-130	2.30	(< 20)
Ethylbenzene	0.500U	30.0	30.2	101	30.0	29.2	97	79-121	3.40	(< 20)
Isopropylbenzene (Cumene)	0.500U	30.0	32.4	108	30.0	31.5	105	72-131	2.90	(< 20)
Methyl-t-butyl ether	5.00U	45.0	49.9	111	45.0	45.4	101	71-124	9.40	(< 20)
Naphthalene	0.500U	30.0	31.3	104	30.0	29.6	99	61-128	5.60	(< 20)
n-Butylbenzene	0.500U	30.0	28.4	95	30.0	28.9	96	75-128	1.80	(< 20)
n-hexane	0.500U	30.0	27.8	93	30.0	27.9	93	70-130	0.68	(< 20)
n-Propylbenzene	0.500U	30.0	28.9	97	30.0	29.8	99	76-126	2.90	(< 20)
o-Xylene	0.500U	30.0	29.6	99	30.0	28.8	96	78-122	2.80	(< 20)
P & M -Xylene	1.00U	60.0	58.2	97	60.0	56.5	94	80-121	3.10	(< 20)
sec-Butylbenzene	0.500U	30.0	28.2	94	30.0	29.2	97	77-126	3.30	(< 20)
tert-Butylbenzene	0.500U	30.0	28.2	94	30.0	28.8	96	78-124	2.20	(< 20)
Toluene	0.500U	30.0	26.6	89	30.0	25.8	86	80-121	3.10	(< 20)
Xylenes (total)	1.50U	90.0	87.9	98	90.0	85.3	95	79-121	3.00	(< 20)
<b>Surrogates</b>										
1,2-Dichloroethane-D4 (surr)		30.0	32.2	107	30.0	31.0	103	81-118	3.90	
4-Bromofluorobenzene (surr)		30.0	29.1	97	30.0	29.2	97	85-114	0.48	
Toluene-d8 (surr)		30.0	29.5	98	30.0	29.6	99	89-112	0.34	

### Batch Information

Analytical Batch: VMS22645  
 Analytical Method: SW8260D  
 Instrument: VPA 780/5975 GC/MS  
 Analyst: JY  
 Analytical Date/Time: 8/8/2023 9:36:00PM

Prep Batch: VXX40240  
 Prep Method: Volatiles Extraction 8240/8260  
 Prep Date/Time: 8/8/2023 6:00:00AM  
 Prep Initial Wt./Vol.: 5.00mL  
 Prep Extract Vol: 5.00mL

Print Date: 09/12/2023 8:40:00AM

## Method Blank

Blank ID: MB for HBN 1861487 [VXX/40241]  
 Blank Lab ID: 1727749

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
 1233915012

## Results by SW8260D

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	0.500	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	0.0375	ug/L
1,2-Dichloroethane	0.250U	0.500	0.200	0.250	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	0.500	ug/L
Benzene	0.200U	0.400	0.120	0.200	ug/L
Cyclohexane	0.500U	1.00	0.310	0.500	ug/L
Ethylbenzene	0.500U	1.00	0.310	0.500	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	0.500	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	5.00	ug/L
Naphthalene	0.500U	1.00	0.310	0.500	ug/L
n-Butylbenzene	0.500U	1.00	0.310	0.500	ug/L
n-hexane	0.500U	1.00	0.310	0.500	ug/L
n-Propylbenzene	0.500U	1.00	0.310	0.500	ug/L
o-Xylene	0.500U	1.00	0.310	0.500	ug/L
P & M -Xylene	1.00U	2.00	0.620	1.00	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	0.500	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	0.500	ug/L
Toluene	0.500U	1.00	0.310	0.500	ug/L
Xylenes (total)	1.50U	3.00	1.00	1.50	ug/L

## Surrogates

1,2-Dichloroethane-D4 (surr)	103	81-118	0	%
4-Bromofluorobenzene (surr)	102	85-114	0	%
Toluene-d8 (surr)	101	89-112	0	%

## Batch Information

Analytical Batch: VMS22646  
 Analytical Method: SW8260D  
 Instrument: Agilent 7890-75MS  
 Analyst: PHK  
 Analytical Date/Time: 8/8/2023 1:19:00PM

Prep Batch: VXX40241  
 Prep Method: SW5030B  
 Prep Date/Time: 8/8/2023 6:00:00AM  
 Prep Initial Wt./Vol.: 5 mL  
 Prep Extract Vol: 5 mL





**Blank Spike Summary**

Blank Spike ID: LCS for HBN 1233915 [VXX40241]  
 Blank Spike Lab ID: 1727750  
 Date Analyzed: 08/08/2023 13:34

Spike Duplicate ID: LCSD for HBN 1233915 [VXX40241]  
 Spike Duplicate Lab ID: 1727751  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915012

**Results by SW8260D**

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1,2,4-Trimethylbenzene	30	31.1	104	30	31.5	105	( 79-124 )	1.20	(< 20 )
1,2-Dibromoethane	30	31.3	104	30	31.0	103	( 77-121 )	1.20	(< 20 )
1,2-Dichloroethane	30	27.9	93	30	28.1	94	( 73-128 )	0.78	(< 20 )
1,3,5-Trimethylbenzene	30	30.3	101	30	30.6	102	( 75-124 )	0.85	(< 20 )
Benzene	30	29.5	98	30	29.3	98	( 79-120 )	0.51	(< 20 )
Cyclohexane	30	28.7	96	30	27.9	93	( 70-130 )	2.80	(< 20 )
Ethylbenzene	30	30.0	100	30	29.1	97	( 79-121 )	3.00	(< 20 )
Isopropylbenzene (Cumene)	30	30.9	103	30	29.7	99	( 72-131 )	3.90	(< 20 )
Methyl-t-butyl ether	45	45.5	101	45	46.5	103	( 71-124 )	2.10	(< 20 )
Naphthalene	30	28.8	96	30	36.8	123	( 61-128 )	24.20	* (< 20 )
n-Butylbenzene	30	29.6	99	30	31.1	104	( 75-128 )	5.20	(< 20 )
n-hexane	30	28.4	95	30	27.2	91	( 70-130 )	4.20	(< 20 )
n-Propylbenzene	30	30.3	101	30	29.7	99	( 76-126 )	1.90	(< 20 )
o-Xylene	30	30.6	102	30	29.7	99	( 78-122 )	2.80	(< 20 )
P & M -Xylene	60	62.0	103	60	59.6	99	( 80-121 )	4.00	(< 20 )
sec-Butylbenzene	30	29.9	100	30	29.7	99	( 77-126 )	0.40	(< 20 )
tert-Butylbenzene	30	29.9	100	30	29.4	98	( 78-124 )	1.80	(< 20 )
Toluene	30	28.1	94	30	27.6	92	( 80-121 )	2.00	(< 20 )
Xylenes (total)	90	92.6	103	90	89.4	99	( 79-121 )	3.60	(< 20 )

**Surrogates**

1,2-Dichloroethane-D4 (surr)	30		97	30		98	( 81-118 )	1.10	
4-Bromofluorobenzene (surr)	30		98	30		98	( 85-114 )	0.48	
Toluene-d8 (surr)	30		101	30		101	( 89-112 )	0.26	

**Batch Information**

Analytical Batch: **VMS22646**  
 Analytical Method: **SW8260D**  
 Instrument: **Agilent 7890-75MS**  
 Analyst: **PHK**

Prep Batch: **VXX40241**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/08/2023 06:00**  
 Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:04AM



### Method Blank

Blank ID: MB for HBN 1861737 [VXX/40249]  
Blank Lab ID: 1728070

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1233915012

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	0.0500	mg/L
<b>Surrogates</b>					
4-Bromofluorobenzene (surr)	95.1	50-150		0	%

### Batch Information

Analytical Batch: VFC16556  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: CWD  
Analytical Date/Time: 8/9/2023 10:23:00AM

Prep Batch: VXX40249  
Prep Method: SW5030B  
Prep Date/Time: 8/9/2023 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:07AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [VXX40249]  
 Blank Spike Lab ID: 1728073  
 Date Analyzed: 08/09/2023 11:18

Spike Duplicate ID: LCSD for HBN 1233915 [VXX40249]  
 Spike Duplicate Lab ID: 1728074  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915012

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.932	93	1.00	0.916	92	( 60-120 )	1.80	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500		99	0.0500		104	( 50-150 )	5.80	
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### Batch Information

Analytical Batch: **VFC16556**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **CWD**

Prep Batch: **VXX40249**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/09/2023 06:00**  
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:10AM



### Method Blank

Blank ID: MB for HBN 1861837 [VXX/40251]  
Blank Lab ID: 1728141

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1233915001, 1233915005, 1233915006, 1233915007, 1233915008

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	0.0500	mg/L
<b>Surrogates</b>					
4-Bromofluorobenzene (surr)	96.1	50-150		0	%

### Batch Information

Analytical Batch: VFC16557  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: CWD  
Analytical Date/Time: 8/10/2023 10:51:00AM

Prep Batch: VXX40251  
Prep Method: SW5030B  
Prep Date/Time: 8/10/2023 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:13AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [VXX40251]  
 Blank Spike Lab ID: 1728142  
 Date Analyzed: 08/10/2023 11:27

Spike Duplicate ID: LCSD for HBN 1233915 [VXX40251]  
 Spike Duplicate Lab ID: 1728143  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915001, 1233915005, 1233915006, 1233915007, 1233915008

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.954	95	1.00	0.980	98	( 60-120 )	2.70	(< 20 )
<b>Surrogates</b>									
4-Bromofluorobenzene (surr)	0.0500		100	0.0500		111	( 50-150 )	10.00	

### Batch Information

Analytical Batch: **VFC16557**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **CWD**

Prep Batch: **VXX40251**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/10/2023 06:00**  
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:15AM





### Billable Matrix Spike Summary

Original Sample ID: 1233915001  
MS Sample ID: 1233915002 BMS  
MSD Sample ID: 1233915003 BMSD

Analysis Date: 08/10/2023 15:52  
Analysis Date: 08/10/2023 16:10  
Analysis Date: 08/10/2023 16:28  
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

### Results by AK101

Parameter	Sample	Matrix Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	0.0500U	1.00	0.991	99	1.00	1.14	114	60-120	13.70	(< 20 )
<b>Surrogates</b>										
4-Bromofluorobenzene (surr)		0.0500	0.0525	105	0.0500	0.0534	107	50-150	1.80	

### Batch Information

Analytical Batch: VFC16557  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: CWD  
Analytical Date/Time: 8/10/2023 4:10:00PM

Prep Batch: VXX40251  
Prep Method: Volatile Fuels Extraction (W)  
Prep Date/Time: 8/10/2023 6:00:00AM  
Prep Initial Wt./Vol.: 5.00mL  
Prep Extract Vol: 5.00mL

Print Date: 09/12/2023 8:40:17AM



### Method Blank

Blank ID: MB for HBN 1862143 [VXX/40255]

Blank Lab ID: 1728390

QC for Samples:

1233915004

Matrix: Water (Surface, Eff., Ground)

### Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
Gasoline Range Organics	0.0500U	0.100	0.0450	0.0500	mg/L
<b>Surrogates</b>					
4-Bromofluorobenzene (surr)	92.9	50-150		0	%

### Batch Information

Analytical Batch: VFC16559  
Analytical Method: AK101  
Instrument: Agilent 7890A PID/FID  
Analyst: CWD  
Analytical Date/Time: 8/11/2023 12:05:00PM

Prep Batch: VXX40255  
Prep Method: SW5030B  
Prep Date/Time: 8/11/2023 6:00:00AM  
Prep Initial Wt./Vol.: 5 mL  
Prep Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:19AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [VXX40255]  
 Blank Spike Lab ID: 1728393  
 Date Analyzed: 08/11/2023 13:00

Spike Duplicate ID: LCSD for HBN 1233915 [VXX40255]  
 Spike Duplicate Lab ID: 1728394  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915004

### Results by AK101

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	1.00	0.976	98	1.00	0.932	93	( 60-120 )	4.60	(< 20 )

### Surrogates

4-Bromofluorobenzene (surr)	0.0500		108	0.0500		101	( 50-150 )	7.00	
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### Batch Information

Analytical Batch: **VFC16559**  
 Analytical Method: **AK101**  
 Instrument: **Agilent 7890A PID/FID**  
 Analyst: **CWD**

Prep Batch: **VXX40255**  
 Prep Method: **SW5030B**  
 Prep Date/Time: **08/11/2023 06:00**  
 Spike Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 0.0500 mg/L Extract Vol: 5 mL

Print Date: 09/12/2023 8:40:22AM

## Method Blank

Blank ID: MB for HBN 1860631 [XXX/48326]

Blank Lab ID: 1726208

QC for Samples:

1233915009, 1233915010

Matrix: Soil/Solid (dry weight)

## Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	9.00	10.0	mg/kg
<b>Surrogates</b>					
5a Androstane (surr)	88.9	60-120		0	%

## Batch Information

Analytical Batch: XFC16595

Analytical Method: AK102

Instrument: Agilent 7890B R

Analyst: T.L

Analytical Date/Time: 8/5/2023 10:40:00PM

Prep Batch: XXX48326

Prep Method: SW3550C

Prep Date/Time: 8/2/2023 7:43:48AM

Prep Initial Wt./Vol.: 22.5 g

Prep Extract Vol: 5 mL

## Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [XXX48326]  
 Blank Spike Lab ID: 1726209  
 Date Analyzed: 08/05/2023 22:50

Spike Duplicate ID: LCSD for HBN 1233915 [XXX48326]  
 Spike Duplicate Lab ID: 1726210  
 Matrix: Soil/Solid (dry weight)

QC for Samples: 1233915009, 1233915010

## Results by AK102

Parameter	Blank Spike (mg/kg)			Spike Duplicate (mg/kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	1110	927	83	1110	967	87	( 75-125 )	4.30	(< 20 )
<b>Surrogates</b>									
5a Androstane (surr)	22.2		91	22.2		94	( 60-120 )	3.90	

## Batch Information

Analytical Batch: **XFC16595**  
 Analytical Method: **AK102**  
 Instrument: **Agilent 7890B R**  
 Analyst: **T.L**

Prep Batch: **XXX48326**  
 Prep Method: **SW3550C**  
 Prep Date/Time: **08/02/2023 07:43**  
 Spike Init Wt./Vol.: 22.2 mg/kg Extract Vol: 5 mL  
 Dupe Init Wt./Vol.: 22.2 mg/kg Extract Vol: 5 mL



## Method Blank

Blank ID: MB for HBN 1860866 [XXX/48345]  
 Blank Lab ID: 1726599

Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1233915001, 1233915004, 1233915005, 1233915006, 1233915007, 1233915008

## Results by 8270D SIM LV (PAH)

Parameter	Results	LOQ/CL	DL	LOD	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	0.0250	ug/L
2-Methylnaphthalene	0.0248J	0.0500	0.0150	0.0250	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	0.0250	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	0.0250	ug/L
Anthracene	0.0250U	0.0500	0.0150	0.0250	ug/L
Benzo(a)Anthracene	0.0158J	0.0500	0.0150	0.0250	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	0.0100	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	0.0250	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	0.0250	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	0.0250	ug/L
Chrysene	0.0250U	0.0500	0.0150	0.0250	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	0.0100	ug/L
Fluoranthene	0.0214J	0.0500	0.0150	0.0250	ug/L
Fluorene	0.0250U	0.0500	0.0150	0.0250	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	0.0250	ug/L
Naphthalene	0.0500U	0.100	0.0310	0.0500	ug/L
Phenanthrene	0.0500U	0.100	0.0310	0.0500	ug/L
Pyrene	0.0188J	0.0500	0.0150	0.0250	ug/L
<b>Surrogates</b>					
2-Methylnaphthalene-d10 (surr)	78.2	38-100		0	%
Fluoranthene-d10 (surr)	79.3	30-111		0	%

## Batch Information

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Instrument: Agilent 8890 GC/MS SYA  
 Analyst: HMW  
 Analytical Date/Time: 8/5/2023 7:23:00PM

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 8/4/2023 7:15:00AM  
 Prep Initial Wt./Vol.: 250 mL  
 Prep Extract Vol: 1 mL



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [XXX48345]  
 Blank Spike Lab ID: 1726600  
 Date Analyzed: 08/05/2023 19:39

Spike Duplicate ID: LCSD for HBN 1233915  
 [XXX48345]  
 Spike Duplicate Lab ID: 1726601  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915001, 1233915004, 1233915005, 1233915006, 1233915007, 1233915008

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

Parameter	Blank Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	2	1.35	67	2	1.50	75	( 41-115 )	10.90	(< 20 )
2-Methylnaphthalene	2	1.37	69	2	1.48	74	( 39-114 )	7.80	(< 20 )
Acenaphthene	2	1.44	72	2	1.56	78	( 48-114 )	8.30	(< 20 )
Acenaphthylene	2	1.36	68	2	1.48	74	( 35-121 )	8.40	(< 20 )
Anthracene	2	1.50	75	2	1.60	80	( 53-119 )	6.30	(< 20 )
Benzo(a)Anthracene	2	1.44	72	2	1.53	77	( 59-120 )	5.80	(< 20 )
Benzo[a]pyrene	2	1.34	67	2	1.51	75	( 53-120 )	11.60	(< 20 )
Benzo[b]Fluoranthene	2	1.42	71	2	1.55	78	( 53-126 )	8.80	(< 20 )
Benzo[g,h,i]perylene	2	0.879	44	2	1.17	59	( 44-128 )	28.50	* (< 20 )
Benzo[k]fluoranthene	2	1.27	64	2	1.44	72	( 54-125 )	12.80	(< 20 )
Chrysene	2	1.40	70	2	1.53	76	( 57-120 )	8.60	(< 20 )
Dibenzo[a,h]anthracene	2	0.811	41	* 2	1.09	55	( 44-131 )	29.60	* (< 20 )
Fluoranthene	2	1.48	74	2	1.56	78	( 58-120 )	5.70	(< 20 )
Fluorene	2	1.45	73	2	1.56	78	( 50-118 )	7.40	(< 20 )
Indeno[1,2,3-c,d] pyrene	2	0.980	49	2	1.25	63	( 48-130 )	24.20	* (< 20 )
Naphthalene	2	1.30	65	2	1.42	71	( 43-114 )	8.40	(< 20 )
Phenanthrene	2	1.45	73	2	1.58	79	( 53-115 )	8.40	(< 20 )
Pyrene	2	1.48	74	2	1.55	78	( 53-121 )	4.60	(< 20 )
<b>Surrogates</b>									
2-Methylnaphthalene-d10 (surr)	2		75	2		84	( 38-100 )	11.50	
Fluoranthene-d10 (surr)	2		77	2		83	( 30-111 )	8.10	

### Batch Information

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Instrument: Agilent 8890 GC/MS SYA  
 Analyst: HMW

Prep Batch: XXX48345  
 Prep Method: SW3520C  
 Prep Date/Time: 08/04/2023 07:15  
 Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Print Date: 09/12/2023 8:40:33AM



### Billable Matrix Spike Summary

Original Sample ID: 1233915001  
 MS Sample ID: 1233915002 BMS  
 MSD Sample ID: 1233915003 BMSD

Analysis Date: 08/05/2023 21:49  
 Analysis Date: 08/05/2023 22:05  
 Analysis Date: 08/05/2023 22:21  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

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

Parameter	Sample	Matrix Spike (ug/L)			Spike Duplicate (ug/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	0.0261U	1.89	1.12	60	1.85	1.06	58	41-115	5.50	(< 20)
2-Methylnaphthalene	0.0225J	1.89	1.14	59	1.85	1.07	56	39-114	6.50	(< 20)
Acenaphthene	0.0261U	1.89	1.18	63	1.85	1.09	59	48-114	7.70	(< 20)
Acenaphthylene	0.0261U	1.89	1.14	60	1.85	1.08	58	35-121	5.50	(< 20)
Anthracene	0.0261U	1.89	1.21	64	1.85	1.15	62	53-119	5.00	(< 20)
Benzo(a)Anthracene	0.0261U	1.89	1.05	56 *	1.85	1.17	63	59-120	10.60	(< 20)
Benzo[a]pyrene	0.0104U	1.89	.851	45 *	1.85	1.05	57	53-120	20.60	* (< 20)
Benzo[b]Fluoranthene	0.0261U	1.89	.994	53 *	1.85	1.10	59	53-126	10.00	(< 20)
Benzo[g,h,i]perylene	0.0261U	1.89	.545	29 *	1.85	0.720	39 *	44-128	27.70	* (< 20)
Benzo[k]fluoranthene	0.0261U	1.89	.788	42 *	1.85	1.04	56	54-125	27.20	* (< 20)
Chrysene	0.0261U	1.89	.95	50 *	1.85	1.11	60	57-120	15.80	(< 20)
Dibenzo[a,h]anthracene	0.0104U	1.89	.466	25 *	1.85	0.688	37 *	44-131	38.40	* (< 20)
Fluoranthene	0.0202J	1.89	1.18	62	1.85	1.16	61	58-120	2.40	(< 20)
Fluorene	0.0261U	1.89	1.19	63	1.85	1.12	60	50-118	6.40	(< 20)
Indeno[1,2,3-c,d] pyrene	0.0261U	1.89	.579	31 *	1.85	0.774	42 *	48-130	28.80	* (< 20)
Naphthalene	0.0520U	1.89	1.12	59	1.85	1.05	57	43-114	5.80	(< 20)
Phenanthrene	0.0520U	1.89	1.2	64	1.85	1.12	61	53-115	6.40	(< 20)
Pyrene	0.0205J	1.89	1.21	63	1.85	1.17	62	53-121	3.10	(< 20)
<b>Surrogates</b>										
2-Methylnaphthalene-d10 (surr)		1.89	1.28	68	1.85	1.21	65	38-100	5.20	
Fluoranthene-d10 (surr)		1.89	1.28	68	1.85	1.27	69	30-111	0.58	

### Batch Information

Analytical Batch: XMS13831  
 Analytical Method: 8270D SIM LV (PAH)  
 Instrument: Agilent 8890 GC/MS SYA  
 Analyst: HMW  
 Analytical Date/Time: 8/5/2023 10:05:00PM

Prep Batch: XXX48345  
 Prep Method: 3520 Liq/Liq Ext for 8270 PAH SIM LV  
 Prep Date/Time: 8/4/2023 7:15:00AM  
 Prep Initial Wt./Vol.: 265.00mL  
 Prep Extract Vol: 1.00mL

Print Date: 09/12/2023 8:40:35AM



### Method Blank

Blank ID: MB for HBN 1861640 [XXX/48384]  
Blank Lab ID: 1727954

Matrix: Water (Surface, Eff., Ground)

QC for Samples:  
1233915001, 1233915004, 1233915005, 1233915006, 1233915007, 1233915008

### Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>LOD</u>	<u>Units</u>
Diesel Range Organics	0.300U	0.600	0.200	0.300	mg/L
<b>Surrogates</b>					
5a Androstane (surr)	90.8	60-120		0	%

### Batch Information

Analytical Batch: XFC16627  
Analytical Method: AK102  
Instrument: Agilent 7890B F  
Analyst: T.L  
Analytical Date/Time: 8/26/2023 11:29:00PM

Prep Batch: XXX48384  
Prep Method: SW3520C  
Prep Date/Time: 8/10/2023 3:20:00PM  
Prep Initial Wt./Vol.: 1000 mL  
Prep Extract Vol: 1 mL

Print Date: 09/12/2023 8:40:36AM



### Blank Spike Summary

Blank Spike ID: LCS for HBN 1233915 [XXX48384]  
 Blank Spike Lab ID: 1727955  
 Date Analyzed: 08/26/2023 23:39

Spike Duplicate ID: LCSD for HBN 1233915  
 [XXX48384]  
 Spike Duplicate Lab ID: 1727956  
 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1233915001, 1233915004, 1233915005, 1233915006, 1233915007, 1233915008

### Results by AK102

Parameter	Blank Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	5	4.17	84	5	4.47	90	( 75-125 )	7.00	(< 20 )
<b>Surrogates</b>									
5a Androstane (surr)	0.1		92	0.1		101	( 60-120 )	9.30	

### Batch Information

Analytical Batch: **XFC16627**  
 Analytical Method: **AK102**  
 Instrument: **Agilent 7890B F**  
 Analyst: **T.L**

Prep Batch: **XXX48384**  
 Prep Method: **SW3520C**  
 Prep Date/Time: **08/10/2023 15:20**  
 Spike Init Wt./Vol.: 0.1 mg/L Extract Vol: 1 mL  
 Dupe Init Wt./Vol.: 0.1 mg/L Extract Vol: 1 mL

Print Date: 09/12/2023 8:40:39AM





### Billable Matrix Spike Summary

Original Sample ID: 1233915001  
MS Sample ID: 1233915002 BMS  
MSD Sample ID: 1233915003 BMSD

Analysis Date: 08/27/2023 0:00  
Analysis Date: 08/27/2023 0:10  
Analysis Date: 08/27/2023 0:20  
Matrix: Water (Surface, Eff., Ground)

QC for Samples:

### Results by AK102

Parameter	Sample	Matrix Spike (mg/L)			Spike Duplicate (mg/L)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	0.330U	5.10	4.22	83	5.43	5.06	93	75-125	18.10	(< 30 )
<b>Surrogates</b>										
5a Androstane (surr)		0.102	.1	98	0.109	0.106	97	50-150	5.60	

### Batch Information

Analytical Batch: XFC16627  
Analytical Method: AK102  
Instrument: Agilent 7890B F  
Analyst: T.L  
Analytical Date/Time: 8/27/2023 12:10:00AM

Prep Batch: XXX48384  
Prep Method: Liquid/Liquid Extraction for AK102  
Prep Date/Time: 8/10/2023 3:20:00PM  
Prep Initial Wt./Vol.: 980.00mL  
Prep Extract Vol: 1.00mL

Print Date: 09/12/2023 8:40:41AM



# CHAIN OF CUSTODY

# 1233915



### PROJECT INFO

PROJECT: PNG0967 King Salmon Earth Sta

P.O. #: 100050859

QUOTE #:

SITE REF:

TURN AROUND TIME: **Standard**

REPORT LEVEL:  Level I  Level II  Level IV

SPECIAL DELIVERABLES:

- DoD
- EDD/Version:
- State of Origin:

### SPECIAL INSTRUCTIONS / COMMENTS

PRESERVATIVE					
HCl	HCl	HCl			
ANALYSIS & METHOD					
p-VOCs	GRO	DRO	PAHS	PFOA/PFOS	
X	X		X	X	
X	X		X	X	
X	X	X	X	X	
X	X		X	X	
X	X		X	X	
		X			
		X			
				X	
X	X				

### SEND DOCUMENTATION / RESULTS TO

COMPANY: **Geosyntec Consultants**

CONTACT: **Matt Faust**

ADDRESS: **3003 Minnesota Drive**

PHONE: **907-382-3824** EMAIL: **matthew.faust**

### INVOICE TO CHECK IF SAME

COMPANY:

CONTACT:

ADDRESS:

PHONE:

*profile # 395569*

EMAIL:

SAMPLE ID / DESCRIPTION	DATE	TIME	TYPE (C, G)	MATRIX	CONT	p-VOCs	GRO	DRO	PAHS	PFOA/PFOS	QC			QTY	REMARKS
											MS	MSD	DUP		
23KSES-MW01-GW	7/29	1550	G	GW	16	X	X		X	X		X	X		(1) AS Likely low level (2) AE (3) AE
23KSES-MW02-GW	7/29	1655	G	GW	8	X	X		X	X					(4) AS Likely low level
23KSES-MW03-GW	7/29	1742	G	GW	10	X	X	X	X	X					(5) AS Likely low level
23KSES-MW04-GW	7/30	0604	G	GW	8	X	X		X	X					(6) AS Likely low level
23KSES-MW05-GW	7/30	0720	G	GW	8	X	X		X	X					(7) AS Petroleum odor
23KSES-MW06-GW	7/30	0800	G	GW	8	X	X		X	X					(8) AS Petroleum odor
23KSES-SB04-SO-6.5	7/28	1450	G	SO	1			X							(9) A Likely low level
23KSES-SB041-SO-6.5	7/28	1530	G	SO	1			X							(10) A Likely low level
23KSES-IDW-WA	7/30	0751	G	Aq	2					X					(11) AB
Trip Blank						X	X								(12) AB

COLLECTED/RELINQUISHED BY (1): <i>[Signature]</i>	DATE: 7/31	TIME: 0800	RECEIVED BY: <i>[Signature]</i>	RECEIVED BY LABORATORY: <i>[Signature]</i>	DATE: 7/31/23	TIME: 12:08
RELINQUISHED BY (2):	DATE:	TIME:	RECEIVED BY:	COOLER SEAL: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT		
RELINQUISHED BY (3):	DATE:	TIME:	RECEIVED BY:	CONTAINER SEALS: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT		
				CARRIER:	TEMP: °C 2.4°C	
				TRACKING #:	DSS	



# CHAIN OF CUSTODY

### PROJECT INFO

PROJECT: PNG0967 King Salmon Earth Sta

PO #: 100050859

QUOTE #:

SITE REF:

TURN AROUND TIME: Standard

REPORT LEVEL:  Level I  Level II  Level IV

SPECIAL DELIVERABLES:

- DoD
- EDD/Version:
- State of Origin:

### SPECIAL INSTRUCTIONS / COMMENTS

PRESERVATIVE									
HCI	HCI	HCI							
ANALYSIS & METHOD									
p-VOCs	GRO	DRO	PAHs	PFOA/PFOS					
		X							
		X							
		X							
		X							
		X							

### SEND DOCUMENTATION / RESULTS TO

COMPANY: Geosyntec Consultants

CONTACT: Matt Faust

ADDRESS: 3003 Minnesota Drive

PHONE: 907-382-3826 EMAIL: matthew.faus

INVOICE TO  CHECK IF SAME

COMPANY:

CONTACT:

ADDRESS:

PHONE:

EMAIL:

SAMPLE ID / DESCRIPTION	DATE	TIME	TYPE (C, G)	MATRIX	CONT	p-VOCs	GRO	DRO	PAHs	PFOA/PFOS	QC			QTY	REMARKS
											MS	MSD	DUP		
23KSES-MW01-GW	7/29	1550	G	GW	4			X				X	X		0.6H Likely low level (2) (3)
23KSES-MW02-GW	7/29	1655	G	GW	2			X							0.7H Likely low level
23KSES-MW04-GW	7/30	0604	G	GW	2			X							0.6H Likely low level
23KSES-MW05-GW	7/30	0720	G	GW	2			X							0.7GH Petroleum odor
23KSES-MW06-GW	7/30	0800	G	GW	2			X							0.8GH Petroleum odor

COLLECTED/RELINQUISHED BY (1): <i>[Signature]</i>	DATE: 7/31	TIME: 0800	RECEIVED BY: <i>[Signature]</i>	RECEIVED BY LABORATORY: <i>[Signature]</i>	DATE: 7/31/13	TIME: 12:08
RELINQUISHED BY (2):	DATE:	TIME:	RECEIVED BY:	COOLER SEAL: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT		
RELINQUISHED BY (3):	DATE:	TIME:	RECEIVED BY:	CONTAINER SEALS: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT		
				CARRIER:	TEMP: °C	2.4°C
				TRACKING #:	D55	



# CHAIN OF CUSTODY

1233915



### PROJECT INFO

PROJECT: PNG0967 King Salmon Earth Sta

PO #: 100050859

QUOTE #:

SITE REF:

TURN AROUND TIME: Standard

REPORT LEVEL:  Level I  Level II  Level IV

### SPECIAL DELIVERABLES:

- DoD
- EDD/Version:
- State of Origin:

### SPECIAL INSTRUCTIONS / COMMENTS

PRESERVATIVE				
HCl	HCl	HCl		

Please Strike  
PFOA/PFOS  
analysis from all  
samples except for  
23KSES-IDW-QA

### SEND DOCUMENTATION / RESULTS TO

COMPANY: Geosyntec Consultants

CONTACT: Matt Faust

03 Minnesota Drive

382-3826 EMAIL: matthew.faus

CHECK IF SAME

CONTACT:

ADDRESS:

PHONE:

EMAIL:

profile # 3955095

SAMPLE ID / DESCRIPTION	DATE	TIME	TYPE (C, G)	MATRIX	CONT	ANALYSIS & METHOD					QC			REMARKS	
						p-VOCs	GRO	DRO	PAHs	PFOA/PFOS	MS	MSD	DUP		QTY
23KSES-MW01-GW	7/29	1550	G	GW	16	X	X		X	X		X	X		DAS Likely low level (2) (3)
23KSES-MW02-GW	7/29	1655	G	GW	8	X	X		X	X					DAS Likely low level
23KSES-MW03-GW	7/29	1742	G	GW	10	X	X	X	X	X					DAS Likely low level
23KSES-MW04-GW	7/30	0604	G	GW	8	X	X		X	X					DAS Likely low level
23KSES-MW05-GW	7/30	0720	G	GW	8	X	X		X	X					DAS Petroleum odor
23KSES-MW06-GW	7/30	0800	G	GW	8	X	X		X	X					DAS Petroleum odor
23KSES-SB04-SO-6.5	7/28	1450	G	SO	1			X							DAS Likely low level
23KSES-SB041-SO-6.5	7/28	1530	G	SO	1			X							DAS Likely low level
23KSES-IDW-WA	7/30	0751	G	Aq	2					X					DAS
Trip Blank						X	X								DAS

COLLECTED/RELINQUISHED BY (1):	DATE:	TIME:	RECEIVED BY:
<i>[Signature]</i>			
RELINQUISHED BY (2):	DATE:	TIME:	RECEIVED BY:
<i>[Signature]</i>			
RELINQUISHED BY (3):	DATE:	TIME:	RECEIVED BY:
<i>[Signature]</i>			

RECEIVED BY LABORATORY:	DATE:	TIME:
Jeremy Gentry	7/31/23	12:08
COOLER SEAL: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT		
CONTAINER SEALS: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN <input type="checkbox"/> ABSENT		
CARRIER:	TEMP: °C	
	2.4°C	
TRACKING #:	D55	



1233915



SAMPLE RECEIPT FORM

Project Manager Completion				
Was all necessary information recorded on the COC upon receipt? (temperature, COC seals, etc.?)	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	
Was temperature between 0-6° C?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	If "No", are the samples either exempt* or sampled <8 hours prior to receipt?
Were all analyses received within holding time*?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	
Was a method specified for each analysis, where applicable? If no, please note correct methods.	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	
Are compound lists specified, where applicable? For project specific or special compound lists please note correct analysis code.	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	
If rush was requested by the client, was the requested TAT approved?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	If "NO", what is the approved TAT?
If SEDD Deliverables are required, were Location ID's and an NPDL Number provided?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	If "NO", contact client for information.
Sample Login Completion				
Do ID's on sample containers match COC?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	
If provided on containers, do dates/times collected match COC?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	Note: If times differ <1 hr., record details below and login per COC.
Were all sample containers received in good condition?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	
Were proper containers (type/mass/volume/preservative) received for all samples? *See form F-083 "Sample Guide"	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A	Note: If 200.8/6020 Total Metals are received unpreserved, preserve and note HNO3 lot here: If 200.8/6020 Dissolved Metals are received unpreserved, log in for LABFILTER and do not preserve. For all non-metals methods, inform Project Manager.
Were Trip Blanks (VOC, GRO, Low-Level Hg, etc.) received with samples, where applicable*?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	
Were all VOA vials free of headspace >6mm?	<input type="radio"/> Yes	<input checked="" type="radio"/> No	N/A	*
Were all soil VOA samples received field extracted with Methanol?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	
Did all soil VOA samples have an accompanying unpreserved container for % solids?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	
If special handling is required, were containers labelled appropriately? e.g. MI/ISM, foreign soils, lab filter, Ref Lab, limited volume	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	SAMPLE, Ref Lab
For Rush/Short Holding time, was the lab notified?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	
For any question answered "NO", was the Project Manager notified?	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A	PM Initials: <i>AKC</i>
Was Peer Review of sample numbering/labelling completed?	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A	Reviewer Initials: <i>HGS</i>
<b>Additional Notes/Clarification where Applicable, including resolution of "No" answers when a change order is not attached:</b>				
* 3A15-2C -4 B&L IF -7D -12C				





### Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1233915001-A	HCL to pH < 2	OK	1233915007-A	HCL to pH < 2	OK
1233915001-B	HCL to pH < 2	OK	1233915007-B	HCL to pH < 2	OK
1233915001-C	HCL to pH < 2	OK	1233915007-C	HCL to pH < 2	OK
1233915001-D	HCL to pH < 2	OK	1233915007-D	HCL to pH < 2	OK
1233915001-E	HCL to pH < 2	OK	1233915007-E	HCL to pH < 2	OK
1233915001-F	HCL to pH < 2	OK	1233915007-F	HCL to pH < 2	OK
1233915001-G	HCL to pH < 2	OK	1233915007-G	HCL to pH < 2	OK
1233915001-H	HCL to pH < 2	OK	1233915007-H	HCL to pH < 2	OK
1233915001-I	No Preservative Required	OK	1233915007-I	No Preservative Required	OK
1233915001-J	No Preservative Required	OK	1233915007-J	No Preservative Required	OK
1233915002-A	HCL to pH < 2	OK	1233915008-A	HCL to pH < 2	OK
1233915002-B	HCL to pH < 2	OK	1233915008-B	HCL to pH < 2	OK
1233915002-C	HCL to pH < 2	OK	1233915008-C	HCL to pH < 2	OK
1233915002-D	HCL to pH < 2	OK	1233915008-D	HCL to pH < 2	OK
1233915002-E	No Preservative Required	OK	1233915008-E	HCL to pH < 2	OK
1233915003-A	HCL to pH < 2	OK	1233915008-F	HCL to pH < 2	OK
1233915003-B	HCL to pH < 2	OK	1233915008-G	HCL to pH < 2	OK
1233915003-C	HCL to pH < 2	OK	1233915008-H	HCL to pH < 2	OK
1233915003-D	HCL to pH < 2	OK	1233915008-I	No Preservative Required	OK
1233915003-E	No Preservative Required	OK	1233915008-J	No Preservative Required	OK
1233915004-A	HCL to pH < 2	OK	1233915009-A	No Preservative Required	OK
1233915004-B	HCL to pH < 2	OK	1233915010-A	No Preservative Required	OK
1233915004-C	HCL to pH < 2	OK	1233915011-A	No Preservative Required	OK
1233915004-D	HCL to pH < 2	OK	1233915011-B	No Preservative Required	OK
1233915004-E	HCL to pH < 2	OK	1233915012-A	HCL to pH < 2	OK
1233915004-F	HCL to pH < 2	OK	1233915012-B	HCL to pH < 2	OK
1233915004-G	HCL to pH < 2	OK	1233915012-C	HCL to pH < 2	OK
1233915004-H	HCL to pH < 2	OK			
1233915004-I	No Preservative Required	OK			
1233915004-J	No Preservative Required	OK			
1233915005-A	HCL to pH < 2	OK			
1233915005-B	HCL to pH < 2	OK			
1233915005-C	HCL to pH < 2	OK			
1233915005-D	HCL to pH < 2	OK			
1233915005-E	HCL to pH < 2	OK			
1233915005-F	HCL to pH < 2	OK			
1233915005-G	HCL to pH < 2	OK			
1233915005-H	HCL to pH < 2	OK			
1233915005-I	No Preservative Required	OK			
1233915005-J	No Preservative Required	OK			
1233915006-A	HCL to pH < 2	OK			
1233915006-B	HCL to pH < 2	OK			
1233915006-C	HCL to pH < 2	OK			
1233915006-D	HCL to pH < 2	OK			
1233915006-E	HCL to pH < 2	OK			
1233915006-F	HCL to pH < 2	OK			
1233915006-G	HCL to pH < 2	OK			
1233915006-H	HCL to pH < 2	OK			
1233915006-I	No Preservative Required	OK			
1233915006-J	No Preservative Required	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 that 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.

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

**SGS North America, Inc**

**1233915**

**SGS Job Number: FC8314**

**Sampling Date: 07/30/23**

**Report to:**

**SGS North America, Inc  
200 W Potter Dr  
Anchorage, AK 99518  
justin.nelson@sgs.com; env.alaska.reflabteam@sgs.com**

**ATTN: Justin Nelson**

**Total number of pages in report: 29**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable unless noted in the narrative, comments or footnotes.

A handwritten signature in black ink that reads "Norm Farmer".

**Norm Farmer  
Technical Director**

**Client Service contact: Andrea Colby 407-425-6700**

Certifications: FL(E83510), LA(03051), KS(E-10327), NC(573), NJ(FL002), NY(12022), SC(96038001)

DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),

AL, AK, AR, CT, IA, KY, MA, MI, MS, ND, NH, NV, OK, OR, IL, UT, VT, WA, WI, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

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## Sample Summary

SGS North America, Inc  
1233915

**Job No:** FC8314

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
FC8314-1	07/30/23	07:51	08/02/23	AQ	Water	23KSES-IDW-WA



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** SGS North America, Inc

**Job No:** FC8314

**Site:** 1233915

**Report Date:** 9/11/2023 5:22:07 PM

On 08/02/2023, 1 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc - Orlando. at a maximum corrected temperature of 3.4 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. - Orlando Job Number of FC8314 was assigned to the project.

Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section. Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### MS Semi-volatiles By Method EPA 537M BY ID

**Matrix:** AQ

**Batch ID:** OP98473

Sample(s) FC8286-2MS, FC8286-3DUP were used as the QC samples indicated.

Sample(s) FC8314-1 have surrogates outside control limits.

FC8314-1 for d5-EtFOSAA: Outside control limits.

FC8314-1 for 13C7-PFUnDA: Outside control limits.

FC8314-1 for 13C2-PFDoDA: Outside control limits.

SGS North America Inc. - Orlando certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted. Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria. SGS North America Inc.- Orlando is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety.

Narrative prepared by:

---

Kim Benham, Client Services (*Signature on File*)

## Summary of Hits

**Job Number:** FC8314  
**Account:** SGS North America, Inc  
**Project:** 1233915  
**Collected:** 07/30/23



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
---------------	------------------	-----------------	-----	-----	-------	--------

**FC8314-1      23KSES-IDW-WA**

Perfluorobutanoic acid	0.121	0.017	0.0083	ug/l	EPA 537M BY ID
Perfluoropentanoic acid	0.508	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluorohexanoic acid	0.558	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluoroheptanoic acid	0.266	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluorooctanoic acid	0.0255	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluorononanoic acid	0.0135	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluorobutanesulfonic acid	0.321	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluoropentanesulfonic acid	0.473	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluorohexanesulfonic acid	0.853	0.042	0.021	ug/l	EPA 537M BY ID
Perfluoroheptanesulfonic acid	0.0048 J	0.0083	0.0042	ug/l	EPA 537M BY ID
Perfluorooctanesulfonic acid	0.0218	0.0083	0.0042	ug/l	EPA 537M BY ID
6:2 Fluorotelomer sulfonate	0.0062 J	0.017	0.0083	ug/l	EPA 537M BY ID

Sample Results

---

Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> 23KSES-IDW-WA	
<b>Lab Sample ID:</b> FC8314-1	<b>Date Sampled:</b> 07/30/23
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 08/02/23
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> 1233915	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5Q19309.D	1	09/02/23 02:07	LR	08/17/23 11:00	OP98473	S5Q304
Run #2	5Q19310.D	5	09/02/23 02:23	LR	08/17/23 11:00	OP98473	S5Q304

	Initial Volume	Final Volume
Run #1	120 ml	1.0 ml
Run #2	120 ml	1.0 ml

**CAS No. Compound Result LOQ LOD DL Units Q**

**PERFLUOROALKYL CARBOXYLIC ACIDS**

375-22-4	Perfluorobutanoic acid	0.121	0.017	0.0083	0.0042	ug/l	
2706-90-3	Perfluoropentanoic acid	0.508	0.0083	0.0042	0.0021	ug/l	
307-24-4	Perfluorohexanoic acid	0.558	0.0083	0.0042	0.0021	ug/l	
375-85-9	Perfluoroheptanoic acid	0.266	0.0083	0.0042	0.0021	ug/l	
335-67-1	Perfluorooctanoic acid	0.0255	0.0083	0.0042	0.0021	ug/l	
375-95-1	Perfluorononanoic acid	0.0135	0.0083	0.0042	0.0021	ug/l	
335-76-2	Perfluorodecanoic acid	0.0042 U	0.0083	0.0042	0.0021	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.021 U <sup>a</sup>	0.042	0.021	0.010	ug/l	
307-55-1	Perfluorododecanoic acid	0.021 U <sup>a</sup>	0.042	0.021	0.010	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.021 U <sup>a</sup>	0.042	0.021	0.010	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0042 U	0.0083	0.0042	0.0021	ug/l	

**PERFLUOROALKYLSULFONIC ACIDS**

375-73-5	Perfluorobutanesulfonic acid	0.321	0.0083	0.0042	0.0021	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.473	0.0083	0.0042	0.0021	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.853 <sup>a</sup>	0.042	0.021	0.010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0048	0.0083	0.0042	0.0021	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.0218	0.0083	0.0042	0.0021	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0042 U	0.0083	0.0042	0.0021	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.021 U <sup>a</sup>	0.042	0.021	0.010	ug/l	

**PERFLUOROOCCTANESULFONAMIDES**

754-91-6	PFOSA	0.0083 U	0.0083	0.0083	0.0042	ug/l	
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**PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS**

2355-31-9	MeFOSAA	0.0083 U	0.017	0.0083	0.0042	ug/l	
2991-50-6	EtFOSAA	0.042 U <sup>a</sup>	0.083	0.042	0.021	ug/l	

**FLUOROTELOMER SULFONATES**

757124-72-4	4:2 Fluorotelomer sulfonate	0.0083 U	0.017	0.0083	0.0042	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0062	0.017	0.0083	0.0042	ug/l	J

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.1  
4

# Report of Analysis

<b>Client Sample ID:</b> 23KSES-IDW-WA	
<b>Lab Sample ID:</b> FC8314-1	<b>Date Sampled:</b> 07/30/23
<b>Matrix:</b> AQ - Water	<b>Date Received:</b> 08/02/23
<b>Method:</b> EPA 537M BY ID EPA 537 MOD	<b>Percent Solids:</b> n/a
<b>Project:</b> 1233915	

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0083 U	0.017	0.0083	0.0042	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	41%	54%	35-135%
	13C5-PFPeA	52%	63%	50-150%
	13C5-PFHxA	66%	70%	50-150%
	13C4-PFHpA	69%	73%	50-150%
	13C8-PFOA	76%	75%	50-150%
	13C9-PFNA	74%	75%	50-150%
	13C6-PFDA	71%	76%	50-150%
	13C7-PFUnDA	2% <sup>b</sup>	65%	40-140%
	13C2-PFDoDA	3% <sup>b</sup>	45%	40-140%
	13C2-PFTeDA	67%	63%	30-130%
	13C3-PFBS	60%	69%	50-150%
	13C3-PFHxS	68%	76%	50-150%
	13C8-PFOS	73%	80%	50-150%
	13C8-FOSA	60%	63%	30-130%
	d3-MeFOSAA	52%	77%	40-140%
	d5-EtFOSAA	1% <sup>b</sup>	73%	40-140%
	13C2-4:2FTS	70%	72%	50-150%
	13C2-6:2FTS	79%	73%	50-150%
	13C2-8:2FTS	74%	72%	50-150%

(a) Result is from Run# 2

(b) Outside control limits.

U = Not detected      LOD = Limit of Detection      J = Indicates an estimated value  
 LOQ = Limit of Quantitation      DL = Detection Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound



Misc. Forms

Custody Documents and Other Forms

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Includes the following where applicable:

- Certification Exceptions
- Chain of Custody

# Parameter Certification Exceptions

**Job Number:** FC8314  
**Account:** SGS/SAKA SGS North America, Inc  
**Project:** 1233915

The following parameters included in this report are exceptions to NELAC certification. The certification status of each is indicated below.

Parameter	CAS#	Method	Mat	Certification Status
4:2 Fluorotelomer sulfonate	757124-72-4	EPA 537M BY ID	AQ	Certified by SOP MS014
6:2 Fluorotelomer sulfonate	27619-97-2	EPA 537M BY ID	AQ	Certified by SOP MS014
8:2 Fluorotelomer sulfonate	39108-34-4	EPA 537M BY ID	AQ	Certified by SOP MS014
EtFOSAA	2991-50-6	EPA 537M BY ID	AQ	Certified by SOP MS014
MeFOSAA	2355-31-9	EPA 537M BY ID	AQ	Certified by SOP MS014
PFOSA	754-91-6	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanesulfonic acid	375-73-5	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorobutanoic acid	375-22-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanesulfonic acid	335-77-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorodecanoic acid	335-76-2	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorododecanoic acid	307-55-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanesulfonic acid	375-92-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroheptanoic acid	375-85-9	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanesulfonic acid	355-46-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorohexanoic acid	307-24-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanesulfonic acid	68259-12-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorononanoic acid	375-95-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanesulfonic acid	1763-23-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorooctanoic acid	335-67-1	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanesulfonic acid	2706-91-4	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoropentanoic acid	2706-90-3	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotetradecanoic acid	376-06-7	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluorotridecanoic acid	72629-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014
Perfluoroundecanoic acid	2058-94-8	EPA 537M BY ID	AQ	Certified by SOP MS014

5.1  
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SGS North America Inc.  
CHAIN OF CUSTODY RECORD



FC8314

Locations Nationwide  
Alaska Florida  
New Jersey Colorado  
Texas North Carolina  
Virginia Louisiana  
[www.us.sgs.com](http://www.us.sgs.com)

CLIENT: SGS North America Inc. - Alaska Division				SGS Reference: <b>SGS Orlando, FL</b>				Page 1 of 1				
CONTACT: Justin Nelson		PHONE NO: (907) 562-2343		Additional Comments: All soils report out in dry weight unless								
PROJECT NAME: 1233915		PWSID#:		CONTAINER	Preservative Used: NONE	TYPE	C = COMP G = GRAB MI = Multi Incremental Soils	537M PFAS List 24	MS	MSD	SGS lab #	Location ID
REPORTS TO: Justin.Nelson		E-MAIL: Justin.Nelson@sgs.com										
INVOICE TO: SGS - Alaska		QUOTE #: 1233915										
env.alaska.accounting@sgs.com		P.O. #:										
RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/MATRIX CODE								
①	23KSES-IDW-WA	07/30/2023	07:51:00	Water	X						1233915011	
Relinquished By: (1)		Date	Time	Received By:	DOD Project? NO		Report to DL (J Flags)? YES		Data Deliverable Requirements: Level 2			
Relinquished By: (2)		Date	Time	Received By:	Cooler ID:		Requested Turnaround Time and-or Special Instructions:					
Relinquished By: (3)		Date	Time	Received By:	Temp Blank °C: 3.6 IR#1		Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT					
Relinquished By: (4)		Date	Time	Received For Laboratory By: 10/5	or Ambient [ ]							

[ X 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301  
[ : 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

[http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)

INITIAL ASSESSMENT SP  
F088\_COC\_REF\_LAB\_20190411  
LABEL VERIFICATION SP

REVIEWED DM

FC8314: Chain of Custody  
Page 1 of 2

# SGS Sample Receipt Summary

Job Number: FC8314

Client: SGS ALASKA

Project: 1233915

Date / Time Received: 8/2/2023 10:15:00 AM

Delivery Method: FED EX

Airbill #'s: 6420 4269 7638

Therm ID: IR 1;                      Therm CF: -0.2;                      # of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.6);

Cooler Temps (Corrected) °C: Cooler 1: (3.4);

<u>Cooler Information</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Temp criteria achieved	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Cooler temp verification	<u>IR Gun</u>		
5. Cooler media	<u>Ice (Bag)</u>		

<u>Trip Blank Information</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>W</u>	<u>or</u>	<u>S</u>	<u>N/A</u>
3. Type Of TB Received		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Information</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Sample labels present on bottles	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Samples preserved properly	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Condition of sample	<u>Intact</u>			
5. Sample recvd within HT	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
7. VOCs have headspace	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
9. Compositing instructions clear	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. % Solids Jar received?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
12. Residual Chlorine Present?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_      Number of 5035 Field Kits: \_\_\_\_\_      Number of Lab Filtered Metals: \_\_\_\_\_

Test Strip Lot #s: pH 0-3 230320      pH 10-12 \_\_\_\_\_      Other: (Specify) pH 1.0 - 12.0      222221

Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001      Technician: SHAYLAP      Date: 8/2/2023 10:15:00 AM      Reviewer: \_\_\_\_\_      Date: \_\_\_\_\_

5.2  
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## MS Semi-volatiles

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### QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



# Method Blank Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-MB	5Q19171.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0015	0.0020	0.0010	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	86% 35-135%
	13C5-PFPeA	86% 50-150%
	13C5-PFHxA	87% 50-150%
	13C4-PFHpA	87% 50-150%
	13C8-PFOA	91% 50-150%
	13C9-PFNA	92% 50-150%
	13C6-PFDA	88% 50-150%
	13C7-PFUnDA	89% 40-140%

# Method Blank Summary

**Job Number:** FC8314  
**Account:** SGS/SAKA SGS North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-MB	5Q19171.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	97% 40-140%
	13C2-PFTeDA	70% 30-130%
	13C3-PFBS	87% 50-150%
	13C3-PFHxS	84% 50-150%
	13C8-PFOS	92% 50-150%
	13C8-FOSA	80% 30-130%
	d3-MeFOSAA	83% 40-140%
	d5-EtFOSAA	76% 40-140%
	13C2-4:2FTS	78% 50-150%
	13C2-6:2FTS	85% 50-150%
	13C2-8:2FTS	83% 50-150%
	13C3-HFPO-DA	84% 50-150%

6.1.1  
6

# Method Blank Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-MB	5Q19293.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0040	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0020	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	0.0015	0.0020	0.0010	ug/l	J
375-85-9	Perfluoroheptanoic acid	ND	0.0020	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0020	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0020	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0020	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0020	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0020	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0020	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0020	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0020	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0020	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0020	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0020	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0020	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0020	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0020	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.0040	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0040	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	76% 35-135%
	13C5-PFPeA	76% 50-150%
	13C5-PFHxA	76% 50-150%
	13C4-PFHpA	77% 50-150%
	13C8-PFOA	79% 50-150%
	13C9-PFNA	79% 50-150%
	13C6-PFDA	78% 50-150%
	13C7-PFUnDA	78% 40-140%

# Method Blank Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-MB	5Q19293.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	71% 40-140%
	13C2-PFTeDA	66% 30-130%
	13C3-PFBS	77% 50-150%
	13C3-PFHxS	76% 50-150%
	13C8-PFOS	77% 50-150%
	13C8-FOSA	72% 30-130%
	d3-MeFOSAA	76% 40-140%
	d5-EtFOSAA	75% 40-140%
	13C2-4:2FTS	71% 50-150%
	13C2-6:2FTS	71% 50-150%
	13C2-8:2FTS	69% 50-150%
	13C3-HFPO-DA	75% 50-150%

6.12  
6



# Instrument Blank

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q304-IBLK	5Q19286.D	1	09/01/23	LR	n/a	n/a	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FC8314-1

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	94% 50-150%
	13C5-PFPeA	94% 50-150%
	13C5-PFHxA	94% 50-150%
	13C4-PFHpA	95% 50-150%
	13C8-PFOA	96% 50-150%
	13C9-PFNA	98% 50-150%
	13C6-PFDA	98% 50-150%
	13C7-PFUnDA	96% 50-150%



# Instrument Blank

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q304-IBLK	5Q19286.D	1	09/01/23	LR	n/a	n/a	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FC8314-1

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	96% 50-150%
	13C2-PFTeDA	94% 50-150%
	13C3-PFBS	94% 50-150%
	13C3-PFHxS	95% 50-150%
	13C8-PFOS	94% 50-150%
	13C8-FOSA	99% 50-150%
	d3-MeFOSAA	96% 50-150%
	d5-EtFOSAA	97% 50-150%
	13C2-4:2FTS	88% 50-150%
	13C2-6:2FTS	87% 50-150%
	13C2-8:2FTS	85% 50-150%

6.1.3

6



# Instrument Blank

**Job Number:** FC8314  
**Account:** SGS/SAK/SGS North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q302-IBLK	5Q19163.D	1	08/31/23	LR	n/a	n/a	S5Q302

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

OP98473-BS, OP98473-DUP, OP98473-MS

CAS No.	Compound	Result	RL	MDL	Units	Q
375-22-4	Perfluorobutanoic acid	ND	0.0080	0.0020	ug/l	
2706-90-3	Perfluoropentanoic acid	ND	0.0040	0.0010	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0040	0.0010	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0040	0.0010	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0040	0.0010	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0040	0.0010	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0040	0.0010	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0040	0.0010	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0040	0.0010	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0040	0.0010	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0040	0.0010	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0040	0.0010	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	ND	0.0040	0.0010	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0040	0.0010	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	ND	0.0040	0.0010	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0040	0.0010	ug/l	
68259-12-1	Perfluorononanesulfonic acid	ND	0.0040	0.0010	ug/l	
335-77-3	Perfluorodecanesulfonic acid	ND	0.0040	0.0010	ug/l	
754-91-6	PFOSA	ND	0.0040	0.0010	ug/l	
2355-31-9	MeFOSAA	ND	0.0080	0.0020	ug/l	
2991-50-6	EtFOSAA	ND	0.0080	0.0020	ug/l	
757124-72-44:2	Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.0080	0.0020	ug/l	

CAS No.	ID Standard Recoveries	Limits
	13C4-PFBA	101% 50-150%
	13C5-PFPeA	103% 50-150%
	13C5-PFHxA	101% 50-150%
	13C4-PFHpA	102% 50-150%
	13C8-PFOA	105% 50-150%
	13C9-PFNA	109% 50-150%
	13C6-PFDA	100% 50-150%
	13C7-PFUnDA	106% 50-150%

# Instrument Blank

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
S5Q302-IBLK	5Q19163.D	1	08/31/23	LR	n/a	n/a	S5Q302

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

OP98473-BS, OP98473-DUP, OP98473-MS

CAS No.	ID Standard Recoveries	Limits
	13C2-PFDoDA	118% 50-150%
	13C2-PFTeDA	97% 50-150%
	13C3-PFBS	101% 50-150%
	13C3-PFHxS	104% 50-150%
	13C8-PFOS	104% 50-150%
	13C8-FOSA	107% 50-150%
	d3-MeFOSAA	99% 50-150%
	d5-EtFOSAA	92% 50-150%
	13C2-4:2FTS	92% 50-150%
	13C2-6:2FTS	97% 50-150%
	13C2-8:2FTS	96% 50-150%

6.1.4  
6

# Blank Spike Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-BS	5Q19170.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0919	115	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0921	115	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0941	118	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0929	116	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0915	114	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0920	115	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0923	115	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0946	118	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0937	117	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0673	84	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0943	118	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0903	113	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0884	111	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0930	116	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0897	112	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0890	111	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0842	105	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0881	110	60-130
754-91-6	PFOSA	0.08	0.0892	112	70-130
2355-31-9	MeFOSAA	0.08	0.0896	112	70-130
2991-50-6	EtFOSAA	0.08	0.0926	116	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0888	111	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0901	113	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0907	113	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	84%	35-135%
	13C5-PFPeA	84%	50-150%
	13C5-PFHxA	85%	50-150%
	13C4-PFHpA	84%	50-150%
	13C8-PFOA	88%	50-150%
	13C9-PFNA	89%	50-150%
	13C6-PFDA	84%	50-150%
	13C7-PFUnDA	86%	40-140%

\* = Outside of Control Limits.



# Blank Spike Summary

**Job Number:** FC8314  
**Account:** SGS/KA SGS North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-BS	5Q19170.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	91%	40-140%
	13C2-PFTeDA	63%	30-130%
	13C3-PFBS	86%	50-150%
	13C3-PFHxS	82%	50-150%
	13C8-PFOS	90%	50-150%
	13C8-FOSA	74%	30-130%
	d3-MeFOSAA	80%	40-140%
	d5-EtFOSAA	70%	40-140%
	13C2-4:2FTS	88%	50-150%
	13C2-6:2FTS	90%	50-150%
	13C2-8:2FTS	90%	50-150%
	13C3-HFPO-DA	82%	50-150%

\* = Outside of Control Limits.



# Blank Spike Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-BS	5Q19292.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
375-22-4	Perfluorobutanoic acid	0.08	0.0921	115	70-130
2706-90-3	Perfluoropentanoic acid	0.08	0.0928	116	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0940	118	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0914	114	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0922	115	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0909	114	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0922	115	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0929	116	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0940	118	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0881	110	60-140
376-06-7	Perfluorotetradecanoic acid	0.08	0.0941	118	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0927	116	70-130
2706-91-4	Perfluoropentanesulfonic acid	0.08	0.0930	116	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.0927	116	70-130
375-92-8	Perfluoroheptanesulfonic acid	0.08	0.0953	119	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0924	116	70-130
68259-12-1	Perfluorononanesulfonic acid	0.08	0.0946	118	65-130
335-77-3	Perfluorodecanesulfonic acid	0.08	0.0879	110	60-130
754-91-6	PFOSA	0.08	0.0928	116	70-130
2355-31-9	MeFOSAA	0.08	0.0920	115	70-130
2991-50-6	EtFOSAA	0.08	0.0926	116	70-130
757124-72-44:2	Fluorotelomer sulfonate	0.08	0.0887	111	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	0.08	0.0945	118	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	0.08	0.0937	117	70-130

CAS No.	ID Standard Recoveries	BSP	Limits
	13C4-PFBA	77%	35-135%
	13C5-PFPeA	76%	50-150%
	13C5-PFHxA	78%	50-150%
	13C4-PFHpA	78%	50-150%
	13C8-PFOA	79%	50-150%
	13C9-PFNA	79%	50-150%
	13C6-PFDA	78%	50-150%
	13C7-PFUnDA	76%	40-140%

\* = Outside of Control Limits.



# Blank Spike Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-BS	5Q19292.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	ID Standard Recoveries	BSP	Limits
	13C2-PFDoDA	68%	40-140%
	13C2-PFTeDA	59%	30-130%
	13C3-PFBS	77%	50-150%
	13C3-PFHxS	78%	50-150%
	13C8-PFOS	78%	50-150%
	13C8-FOSA	66%	30-130%
	d3-MeFOSAA	76%	40-140%
	d5-EtFOSAA	70%	40-140%
	13C2-4:2FTS	82%	50-150%
	13C2-6:2FTS	80%	50-150%
	13C2-8:2FTS	78%	50-150%
	13C3-HFPO-DA	76%	50-150%

\* = Outside of Control Limits.



# Matrix Spike Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-MS	5Q19174.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-2	5Q19173.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-2 <sup>a</sup>	5Q19295.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	Compound	FC8286-2 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
375-22-4	Perfluorobutanoic acid	ND		0.16	0.189	118	70-130
2706-90-3	Perfluoropentanoic acid	ND		0.16	0.182	114	70-130
307-24-4	Perfluorohexanoic acid	ND		0.16	0.184	115	70-130
375-85-9	Perfluoroheptanoic acid	ND		0.16	0.184	115	70-130
335-67-1	Perfluorooctanoic acid	ND		0.16	0.181	113	70-130
375-95-1	Perfluorononanoic acid	ND		0.16	0.178	111	70-130
335-76-2	Perfluorodecanoic acid	ND		0.16	0.179	112	70-130
2058-94-8	Perfluoroundecanoic acid	ND		0.16	0.182	114	70-130
307-55-1	Perfluorododecanoic acid	ND		0.16	0.176	110	70-130
72629-94-8	Perfluorotridecanoic acid	ND		0.16	0.116	73	60-140
376-06-7	Perfluorotetradecanoic acid	ND		0.16	0.171	107	70-130
375-73-5	Perfluorobutanesulfonic acid	ND		0.16	0.180	113	70-130
2706-91-4	Perfluoropentanesulfonic acid	ND		0.16	0.175	109	70-130
355-46-4	Perfluorohexanesulfonic acid	ND		0.16	0.176	110	70-130
375-92-8	Perfluoroheptanesulfonic acid	ND		0.16	0.176	110	70-130
1763-23-1	Perfluorooctanesulfonic acid	ND		0.16	0.170	106	70-130
68259-12-1	Perfluorononanesulfonic acid	ND		0.16	0.149	93	65-130
335-77-3	Perfluorodecanesulfonic acid	ND		0.16	0.136	85	60-130
754-91-6	PFOSA	ND		0.16	0.184	115	70-130
2355-31-9	MeFOSAA	ND		0.16	0.182	114	70-130
2991-50-6	EtFOSAA	ND		0.16	0.182	114	70-130
757124-72-44:2	Fluorotelomer sulfonate	ND		0.16	0.177	111	70-130
27619-97-2	6:2 Fluorotelomer sulfonate	ND		0.16	0.177	111	70-130
39108-34-4	8:2 Fluorotelomer sulfonate	ND		0.16	0.175	109	70-130

CAS No.	ID Standard Recoveries	MS	FC8286-2	FC8286-2	Limits
	13C4-PFBA	75%	85%	78%	35-135%
	13C5-PFPeA	78%	84%	77%	50-150%
	13C5-PFHxA	81%	87%	79%	50-150%
	13C4-PFHpA	80%	86%	77%	50-150%
	13C8-PFOA	82%	87%	77%	50-150%
	13C9-PFNA	81%	85%	75%	50-150%
	13C6-PFDA	76%	79%	71%	50-150%
	13C7-PFUnDA	76%	79%	69%	40-140%

\* = Outside of Control Limits.

# Matrix Spike Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-MS	5Q19174.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-2	5Q19173.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-2 <sup>a</sup>	5Q19295.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	ID Standard Recoveries	MS	FC8286-2	FC8286-2	Limits
	13C2-PFDoDA	81%	82%	64%	40-140%
	13C2-PFTeDA	47%	43%	40%	30-130%
	13C3-PFBS	80%	86%	79%	50-150%
	13C3-PFHxS	77%	83%	75%	50-150%
	13C8-PFOS	76%	80%	69%	50-150%
	13C8-FOSA	55%	69%	60%	30-130%
	d3-MeFOSAA	70%	71%	67%	40-140%
	d5-EtFOSAA	65%	68%	68%	40-140%
	13C2-4:2FTS	81%	78%	73%	50-150%
	13C2-6:2FTS	82%	77%	67%	50-150%
	13C2-8:2FTS	80%	73%	67%	50-150%
	13C3-HFPO-DA	76%			50-150%

(a) Confirmation run.

\* = Outside of Control Limits.

# Duplicate Summary

**Job Number:** FC8314  
**Account:** SGS/SAK North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-DUP	5Q19176.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-3	5Q19175.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-3 <sup>a</sup>	5Q19297.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	Compound	FC8286-3 ug/l	DUP Q ug/l	Q	RPD	Limits
375-22-4	Perfluorobutanoic acid	ND	ND	nc		30
2706-90-3	Perfluoropentanoic acid	ND	ND	nc		30
307-24-4	Perfluorohexanoic acid	ND	ND	nc		30
375-85-9	Perfluoroheptanoic acid	ND	ND	nc		30
335-67-1	Perfluorooctanoic acid	ND	ND	nc		30
375-95-1	Perfluorononanoic acid	ND	ND	nc		30
335-76-2	Perfluorodecanoic acid	ND	ND	nc		30
2058-94-8	Perfluoroundecanoic acid	ND	ND	nc		30
307-55-1	Perfluorododecanoic acid	ND	ND	nc		30
72629-94-8	Perfluorotridecanoic acid	ND	ND	nc		30
376-06-7	Perfluorotetradecanoic acid	ND	ND	nc		30
375-73-5	Perfluorobutanesulfonic acid	ND	ND	nc		30
2706-91-4	Perfluoropentanesulfonic acid	ND	ND	nc		30
355-46-4	Perfluorohexanesulfonic acid	ND	ND	nc		30
375-92-8	Perfluoroheptanesulfonic acid	ND	ND	nc		30
1763-23-1	Perfluorooctanesulfonic acid	ND	ND	nc		30
68259-12-1	Perfluorononanesulfonic acid	ND	ND	nc		30
335-77-3	Perfluorodecanesulfonic acid	ND	ND	nc		30
754-91-6	PFOSA	ND	ND	nc		30
2355-31-9	MeFOSAA	ND	ND	nc		30
2991-50-6	EtFOSAA	ND	ND	nc		30
757124-72-44:2	Fluorotelomer sulfonate	ND	ND	nc		30
27619-97-2	6:2 Fluorotelomer sulfonate	ND	ND	nc		30
39108-34-4	8:2 Fluorotelomer sulfonate	ND	ND	nc		30

CAS No.	ID Standard Recoveries	DUP	FC8286-3	FC8286-3	Limits
	13C4-PFBA	82%	72%	64%	35-135%
	13C5-PFPeA	83%	75%	68%	50-150%
	13C5-PFHxA	86%	77%	69%	50-150%
	13C4-PFHpA	86%	78%	70%	50-150%
	13C8-PFOA	90%	82%	73%	50-150%
	13C9-PFNA	92%	84%	73%	50-150%
	13C6-PFDA	88%	79%	72%	50-150%
	13C7-PFUnDA	89%	80%	70%	40-140%

\* = Outside of Control Limits.

# Duplicate Summary

**Job Number:** FC8314  
**Account:** SGS/KA SGS North America, Inc  
**Project:** 1233915

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP98473-DUP	5Q19176.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-3	5Q19175.D	1	08/31/23	LR	08/17/23	OP98473	S5Q302
FC8286-3 <sup>a</sup>	5Q19297.D	1	09/01/23	LR	08/17/23	OP98473	S5Q304

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FC8314-1

CAS No.	ID Standard Recoveries	DUP	FC8286-3	FC8286-3	Limits
	13C2-PFDoDA	93%	83%	60%	40-140%
	13C2-PFTeDA	75%	69%	65%	30-130%
	13C3-PFBS	86%	79%	72%	50-150%
	13C3-PFHxS	82%	76%	71%	50-150%
	13C8-PFOS	88%	84%	72%	50-150%
	13C8-FOSA	74%	69%	59%	30-130%
	d3-MeFOSAA	80%	72%	68%	40-140%
	d5-EtFOSAA	78%	68%	68%	40-140%
	13C2-4:2FTS	79%	73%	67%	50-150%
	13C2-6:2FTS	83%	77%	61%	50-150%
	13C2-8:2FTS	83%	77%	68%	50-150%
	13C3-HFPO-DA	80%			50-150%

(a) Confirmation run.

\* = Outside of Control Limits.

# **APPENDIX H**

## **ADEC Laboratory Data Review Checklist**



# ADEC Contaminated Sites Program Laboratory Data Review Checklist

<b>Completed By:</b>	Morgan Greenwald	<b>CS Site Name:</b>	King Salmon Earth Station (KSES)	<b>Lab Name:</b>	SGS North America Inc.
<b>Title:</b>	Data Validation Scientist	<b>ADEC File No.:</b>	2569.38.007	<b>Lab Report No.:</b>	1233915
<b>Consulting Firm:</b>	Geosyntec	<b>Hazard ID No.:</b>	2819	<b>Lab Report Date:</b>	09/12/2023

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

## 1. Laboratory

- a. Did an ADEC Contaminated Sites Laboratory Approval Program (CS-LAP) approved laboratory receive and perform all of the submitted sample analyses?

Yes  No  N/A

Comments: Samples received and analyses performed by SGS North America Inc. - Anchorage

- b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses CS-LAP approved?

Yes  No  N/A

Comments: Investigation derived waste (IDW) sample was subcontracted to SGS North America Inc. – Orlando. Note: IDW sample results did not require data validation and are outside of the scope of this data review checklist.

## 2. Chain of Custody (CoC)

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

Yes  No  N/A

Comments: The sample collection dates and relinquishing date did not include the year. The sample collection dates were logged in by the laboratory using the year 2023.

There was a time lapse between the relinquished and received times recorded on the COC. The relinquished time was documented as 08:00, whereas the received time was documented as 12:08.

- b. Were the correct analyses requested?

Yes  No  N/A

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Analyses requested: The following analyses were requested on the COC: “p-VOCs, GRO, DRO, PAHs, and PFOA/PFOS”. Methods were not specified on the COC.

Comments: PFOA/PFOS analyses were initially requested on the COC for the groundwater samples and aqueous IDW sample. However, a revised COC was submitted, on which PFOA/PFOS analysis was requested for only the aqueous IDW sample. The requests for PFOA/PFOS analyses for the groundwater samples were removed.

### 3. Laboratory Sample Receipt Documentation

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

Yes  No  N/A

Cooler temperature(s): 2.4 degrees Celsius

Sample temperature(s): 2.4 degrees Celsius

Comments: Click or tap here to enter text.

- b. Is the sample preservation acceptable – acidified waters, methanol preserved soil (GRO, BTEX, VOCs, etc.)?

Yes  No  N/A

Comments: To the question on the Sample Receipt Form indicating, “Were proper containers (type/mass/volume/preservative) received for all samples?” The answer was “No”. However, no additional detail was provided by the laboratory.

- c. Is the sample condition documented – broken, leaking, zero headspace (VOA vials); canister vacuum/pressure checked and no open valves, etc.?

Yes  No  N/A

Comments:

- d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, canister not holding a vacuum, etc.?

Yes  No  N/A

Comments: According to the Sample Receipt Form in the Laboratory Report, a subset of VOA vials were received with headspace >6mm. This included container C for sample 1233915002 (23KSES-MW01-GW MS), containers B, C, and F for sample 1233915004 (23KSES-MW02-GW), container D for sample 1233915007 (23KSES-MW05-GW), and container C for sample 1233915012 (Trip Blank).

- e. Is the data quality or usability affected?

Yes  No  N/A

Comments: Based on the Container ID information provided on the sample results sheets in the laboratory report, container D for sample 1233915007

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(23KSES-MW05-GW) and container C for sample 1233915012 (Trip Blank) were used for gasoline range organics (GRO) analysis. Therefore, since these containers were received with headspace >6mm and based on professional and technical judgment, the estimated GRO concentration in sample 23KSES-MW05-GW and the non-detect GRO result for sample Trip Blank were QL qualified as estimated with low biases.

#### 4. Case Narrative

- a. Is the case narrative present and understandable?

Yes  No  N/A

Comments: Click or tap here to enter text.

- b. Are there discrepancies, errors, or QC failures identified by the lab?

Yes  No  N/A

Comments: Click or tap here to enter text.

- c. Were all the corrective actions documented?

Yes  No  N/A

Comments: Corrective actions were not addressed in the case narrative.

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

Comments: According to the case narrative, there are no impacts to data quality or usability.

#### 5. Sample Results

- a. Are the correct analyses performed/reported as requested on CoC?

Yes  No  N/A

Comments: Click or tap here to enter text.

- b. Are all applicable holding times met?

Yes  No  N/A

Comments: Click or tap here to enter text.

- c. Are all soils reported on a dry weight basis?

Yes  No  N/A

Comments: The percent solids data, used to report the soil samples on dry weight bases, were not validated.

- d. Are the reported limits of quantitation (LoQ) or limits of detections (LOD), or reporting limits (RL) less than the Cleanup Level or the action level for the project?

Yes  No  N/A

Comments: Click or tap here to enter text.

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e. Is the data quality or usability affected?

Yes  No  N/A

Comments: Since the LOD and LOQ values are less than the Groundwater and Soil Cleanup Levels, data quality and usability are not affected.

## 6. QC Samples

a. Method Blank

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

Yes  No  N/A

Comments: Click or tap here to enter text.

ii. Are all method blank results less than LOQ (or RL)?

Yes  No

Comments: While the method blank results were less than the LOQs, the following analytes were detected at estimated concentrations greater than the detection limit (DL) and less than the LOD and LOQ in the Method 8270D SIM method blank in batch XXX48345: 2-methylnaphthalene, benzo(a)anthracene, fluoranthene, and pyrene.

iii. If above LoQ or RL, what samples are affected?

Comments: Samples 23KSES-MW01-GW, 23KSES-MW02-GW, 23KSES-MW03-GW, 23KSES-MW04-GW, 23KSES-MW05-GW, and 23KSES-MW06-GW were affected by the Method 8270D SIM method blank in batch XXX48345.

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

Yes  No  N/A

Comments: Sample results were not flagged by the laboratory based on the method blank contamination.

v. Data quality or usability affected?

Yes  No  N/A

Comments: Based on professional and technical judgment, the estimated concentrations of 2-methylnaphthalene, benzo(a)anthracene, fluoranthene, and pyrene greater than the DL and less than the LOQ were B qualified, indicating that the analyte was detected in the method blank or the trip blank above the DL, and the concentration in the sample did not exceed the blank concentration by a factor of 5.

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

- i. Organics – Are 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: Click or tap here to enter text.

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

Yes  No  N/A

Comments: Metals/Inorganics not reported for the sample set.

- iii. Accuracy – Are 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: The LCS recovery of dibenzo[a,h]anthracene in Method 8270D SIM batch XXX48345 was low and outside the laboratory specified acceptance criteria.

- iv. Precision – Are all relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? Was the 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: The LCS/LCSD RPDs for benzo[g,h,i]perylene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d] pyrene in Method 8270D SIM batch XXX48345 and for naphthalene in Method 8260D batch VXX40241 were high and outside the laboratory specified acceptance criteria.

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

Comments: Samples 23KSES-MW01-GW, 23KSES-MW02-GW, 23KSES-MW03-GW, 23KSES-MW04-GW, 23KSES-MW05-GW, and 23KSES-MW06-GW were affected by the low LCS recovery and high RPDs for the LCS/LCSD pair in Method 8270D SIM batch XXX48345. Sample Trip Blank was affected by the high RPD for the LCS/LCSD pair in Method 8260D batch VXX40241.

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

Yes  No  N/A

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Comments: The affected LCS and/or LCSD sample results were flagged with \* by the laboratory to indicate that the analyte has exceeded allowable regulatory or control limits. However, the associated project sample results were not flagged by the laboratory.

vii. Is the data quality or usability affected?

Yes  No  N/A

Comments: Based on the low LCS recovery of dibenzo[a,h]anthracene in Method 8270D SIM batch XXX48345, the non-detect dibenzo[a,h]anthracene results in samples 23KSES-MW01-GW, 23KSES-MW02-GW, 23KSES-MW03-GW, 23KSES-MW04-GW, 23KSES-MW05-GW, and 23KSES-MW06-GW were R qualified as rejected. A rejected result is not usable and, therefore, should be deleted from the report.

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

i. Organics – Are one MS/MSD reported per matrix, analysis and 20 samples?

Yes  No  N/A

Comments: Sample set specific MS/MSD pairs were reported for Methods AK101, AK102, 8260D, and 8270D SIM, using sample 23KSES-MW01-GW.

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

Yes  No  N/A

Comments: Metals/Inorganics not reported for the sample set.

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

Yes  No  N/A

Comments: The MS and/or MSD recoveries of the following analytes were low and outside the laboratory specified acceptance criteria in the Method 8270D SIM MS/MSD pair using sample 23KSES-MW01-GW: benzo(a)anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d] pyrene.

iv. Precision – Are 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 RPDs for the following analytes were high and outside the laboratory specified acceptance criteria in the Method 8270D



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SIM MS/MSD pair using sample 23KSES-MW01-GW: benzo[a]pyrene, benzo[g,h,i]perylene, benzo[k]fluoranthene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d] pyrene.

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

Comments: Sample 23KSES-MW01-GW is affected by the low MS/MSD recoveries and high MS/MSD RPDs for the MS/MSD pair using sample 23KSES-MW01-GW in Method 8270D SIM batch XXX48345.

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

Yes  No  N/A

Comments: The affected MS/MSD sample results were flagged with \* by the laboratory to indicate that the analyte has exceeded allowable regulatory or control limits. However, the associated project sample results were not flagged by the laboratory.

- vii. Is the data quality or usability affected?

Yes  No  N/A

Comments: Based on low Method 8270D SIM MS and/or MSD recoveries, the non-detect benzo(a)anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno[1,2,3-c,d] pyrene results in sample 23KSES-MW01-GW were QL qualified as estimated with low biases.

- 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: Click or tap here to enter text.

- ii. Accuracy – Are 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: Click or tap here to enter text.

- 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: There were no surrogate failures in the project samples.

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iv. Is the data quality or usability affected?

Yes  No  N/A

Comments: Data quality and usability are not affected by the surrogate results.

e. Trip Blanks

i. Is one trip blank reported per matrix, analysis, and for each cooler containing volatile samples? Yes  No  N/A

Comments: Click or tap here to enter text.

ii. Are all results less than LoQ or RL?

Yes  No  N/A

Comments: Click or tap here to enter text.

iii. If above LoQ or RL, what samples are affected?

Comments: N/A

iv. Is the data quality or usability affected?

Yes  No  N/A

Comments: Data quality and usability are not affected by the trip blank results.

f. Field Duplicate

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

Yes  No  N/A

Comments: Click or tap here to enter text.

ii. Was the duplicate submitted blind to lab?

Yes  No  N/A

Comments: Soil field duplicate 23KSES-SB041-SO-6.5 is associated with primary soil sample 23KSES-SB04-SO-6.5.

Water field duplicate 23KSES-MW06-GW is associated with primary water sample 23KSES-MW05-GW.

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

$$RPD (\%) = \left| \frac{R_1 - R_2}{\left(\frac{R_1 + R_2}{2}\right)} \right| \times 100$$

Where  $R_1$  = Sample Concentration

$R_2$  = Field Duplicate Concentration

Is the data quality or usability affected? (Explain)

Yes  No  N/A

Comments: RPDs for 1-methylnaphthalene, chrysene, GRO and toluene were non-calculable due to situations in which one of the compared results is a detection and the other is non-detect or in which one of the compared concentrations is estimated less than the LOQ and the other is greater than the LOQ.

- iv. Is the data quality or usability affected? (Explain)

Yes  No  N/A

Comments: Based on professional and technical judgment, field duplicate RPDs were only evaluated if both results were greater than the LOQ. Data quality and usability are not affected by the field duplicate results.

g. Decontamination or Equipment Blanks

- i. Were decontamination or equipment blanks collected?

Yes  No  N/A

Comments: Click or tap here to enter text.

- ii. Are all results less than LoQ or RL?

Yes  No  N/A

Comments: Decontamination or equipment blanks were not submitted.

- iii. If above LoQ or RL, specify what samples are affected.

Comments: Click or tap here to enter text.

- iv. Are data quality or usability affected?

Yes  No  N/A

Comments: Decontamination or equipment blanks were not specified in the project work plan addendum. Data quality and usability are not affected.

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

a. Are they defined and appropriate?

Yes  No  N/A

Comments: No additional data flags or qualifiers were applied.

# **APPENDIX I**

## Conceptual Site Model and Ecoscoping Forms

# Appendix A - Human Health Conceptual Site Model Scoping Form and Standardized Graphic

Site Name:

File Number:

Completed by:

## Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

*General Instructions: Follow the italicized instructions in each section below.*

## 1. General Information:

**Sources** (*check potential sources at the site*)

- |  |  |
|--|--|
| <input type="checkbox"/> USTs                          | <input type="checkbox"/> Vehicles                    |
| <input type="checkbox"/> ASTs                          | <input type="checkbox"/> Landfills                   |
| <input type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers                |
| <input type="checkbox"/> Drums                         | <input type="checkbox"/> Other: <input type="text"/> |

**Release Mechanisms** (*check potential release mechanisms at the site*)

- |                                 |  |
|---------------------------------|--|
| <input type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge            |
| <input type="checkbox"/> Leaks  | <input type="checkbox"/> Burning                     |
|                                 | <input type="checkbox"/> Other: <input type="text"/> |

**Impacted Media** (*check potentially-impacted media at the site*)

- |  |  |
|--|--|
| <input type="checkbox"/> Surface soil (0-2 feet bgs*)  | <input type="checkbox"/> Groundwater                 |
| <input type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water               |
| <input type="checkbox"/> Air                           | <input type="checkbox"/> Biota                       |
| <input type="checkbox"/> Sediment                      | <input type="checkbox"/> Other: <input type="text"/> |

**Receptors** (*check receptors that could be affected by contamination at the site*)

- |  |  |
|--|--|
| <input type="checkbox"/> Residents (adult or child)                      | <input type="checkbox"/> Site visitor                |
| <input type="checkbox"/> Commercial or industrial worker                 | <input type="checkbox"/> Trespasser                  |
| <input type="checkbox"/> Construction worker                             | <input type="checkbox"/> Recreational user           |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer                      |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods)     | <input type="checkbox"/> Other: <input type="text"/> |

\* bgs - below ground surface



**2. Exposure Pathways:** *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

*If the box is checked, label this pathway complete:*

Comments:

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

*If both boxes are checked, label this pathway complete:*

Comments:

## 2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

*If both boxes are checked, label this pathway complete:*

Comments:

## 3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

*If all of the boxes are checked, label this pathway complete:*

Comments:

### c) Inhalation-

#### 1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Comments:

## 2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

*If both boxes are checked, label this pathway complete:*

Comments:

**3. Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are deemed protective of this pathway because dermal absorption is incorporated into the groundwater exposure equation for residential uses.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**Inhalation of Volatile Compounds in Tap Water**

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

DEC groundwater cleanup levels in 18 AAC 75, Table C are protective of this pathway because the inhalation of vapors during normal household activities is incorporated into the groundwater exposure equation.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM<sub>10</sub>). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.

DEC human health soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because the inhalation of particulates is incorporated into the soil exposure equation.

*Check the box if further evaluation of this pathway is needed:*

Comments:

## Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

*Check the box if further evaluation of this pathway is needed:*

Comments:

**4. Other Comments** (*Provide other comments as necessary to support the information provided in this form.*)



# HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: \_\_\_\_\_  
 \_\_\_\_\_

Completed By: \_\_\_\_\_  
 Date Completed: \_\_\_\_\_

**Instructions:** Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Media	(2) Transport Mechanisms
<input type="checkbox"/> Surface Soil (0-2 ft bgs)	<input type="checkbox"/> Direct release to surface soil <i>check soil</i>
	<input type="checkbox"/> Migration to subsurface <i>check soil</i>
	<input type="checkbox"/> Migration to groundwater <i>check groundwater</i>
	<input type="checkbox"/> Volatilization <i>check air</i>
	<input type="checkbox"/> Runoff or erosion <i>check surface water</i>
	<input type="checkbox"/> Uptake by plants or animals <i>check biota</i>
<input type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input type="checkbox"/> Direct release to subsurface soil <i>check soil</i>
	<input type="checkbox"/> Migration to groundwater <i>check groundwater</i>
	<input type="checkbox"/> Volatilization <i>check air</i>
	<input type="checkbox"/> Uptake by plants or animals <i>check biota</i>
<input type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater <i>check groundwater</i>
	<input type="checkbox"/> Volatilization <i>check air</i>
	<input type="checkbox"/> Flow to surface water body <i>check surface water</i>
	<input type="checkbox"/> Flow to sediment <i>check sediment</i>
	<input type="checkbox"/> Uptake by plants or animals <i>check biota</i>
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i>
	<input type="checkbox"/> Volatilization <i>check air</i>
	<input type="checkbox"/> Sedimentation <i>check sediment</i>
	<input type="checkbox"/> Uptake by plants or animals <i>check biota</i>
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i>
	<input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i>
	<input type="checkbox"/> Uptake by plants or animals <i>check biota</i>
	<input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).

Exposure Media

soil

groundwater

air

surface water

sediment

biota

(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.

Exposure Pathway/Route

Incidental Soil Ingestion

Dermal Absorption of Contaminants from Soil

Inhalation of Fugitive Dust

Ingestion of Groundwater

Dermal Absorption of Contaminants in Groundwater

Inhalation of Volatile Compounds in Tap Water

Inhalation of Outdoor Air

Inhalation of Indoor Air

Inhalation of Fugitive Dust

Ingestion of Surface Water

Dermal Absorption of Contaminants in Surface Water

Inhalation of Volatile Compounds in Tap Water

Direct Contact with Sediment

Ingestion of Wild or Farmed Foods

(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

**Current & Future Receptors**

	Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input type="checkbox"/> Incidental Soil Ingestion							
<input type="checkbox"/> Dermal Absorption of Contaminants from Soil							
<input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> Ingestion of Groundwater							
<input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater							
<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> Inhalation of Outdoor Air							
<input type="checkbox"/> Inhalation of Indoor Air							
<input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> Ingestion of Surface Water							
<input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water							
<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

## Appendix C: Blank Ecoscoping Form

**Site Name:** AT&T Alascom King Salmon Earth Station

**Completed by:** Matt Faust (Geosyntec Consultants)

**Date:** 28 September 2023

*Instructions: Follow the italicized instructions in each section below. “Off-ramps,” where the evaluation ends before completing all of the sections, can be taken when indicated by the instructions. Comment boxes should be used to help support your answers.*

### 1. Direct Visual Impacts and Acute Toxicity

Are direct impacts that may result from the site contaminants evident, or is acute toxicity from high contaminant concentrations suspected? *Check the appropriate box.*

- Yes – *Describe observations below and evaluate all of the remaining sections without taking any off-ramps.*
- No – *Go to next section.*

Comments:

### 2. Terrestrial and Aquatic Exposure Routes

*Check each terrestrial and aquatic route that could occur at the site.*

#### Terrestrial Exposure Routes

- Exposure to water-borne contaminants as a result of wading or swimming in contaminated waters or ingesting contaminated water.
- Contaminant uptake in terrestrial plants whose roots are in contact with contaminated surface water.
- Contaminant migration via saturated or unsaturated groundwater zones and discharge at upland “seep” locations (not associated with a wetland or waterbody).
- Contaminant uptake by terrestrial plants whose roots are in contact with soil moisture or groundwater present within the root zone (generally no more than 4 feet below ground surface).
- Particulates deposited on plants directly or from rain splash.
- Incidental ingestion and/or exposure while animals grub for food, burrow (up to 2 feet for small animals or 6 feet for large animals), or groom.

- Inhalation of fugitive dust or vapors disturbed by foraging or burrowing activities.
- Bioaccumulatives (other than PAHs, which bioaccumulate more readily in aquatic environments) taken up by soil invertebrates, which are in turn eaten by higher food chain organisms (see the *Policy Guidance on Developing Conceptual Site Models*).
- Other site-specific exposure pathways.

Aquatic Exposure Routes

- Contaminated surface runoff migration to water bodies through swales, drainage ditches, or overland flow.
- Aquatic receptors exposed through osmotic exchange, respiration, or ventilation of surface waters.
- Contaminant migration via saturated or unsaturated groundwater zones and discharge at “seep” locations along banks or directly to surface water.
- Deposition into sediments from upwelling of contaminated groundwater.
- Aquatic receptors may be exposed directly to contaminated sediments through foraging or burrowing, or indirectly exposed due to osmotic exchange, respiration, or ventilation of sediment pore water.
- Aquatic plants rooted in contaminated sediments.
- Bioaccumulatives (see the *Policy Guidance on Developing Conceptual Site Models*) taken up by sediment invertebrates, which are in turn eaten by higher food chain organisms.
- Other site-specific exposure pathways.

*If any of the above boxes are checked, go on to the next section. If none are checked, end the evaluation and check the box below.*

OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

**3. Habitat**

*Check all that may apply. See *Ecoscoping Guidance* for additional help.*

- Habitat that could be affected by the contamination supports valued species (i.e., species that are regulated, used for subsistence, have ceremonial importance, have commercial value, or provide recreational opportunity).
- Critical habitat or anadromous stream in an area that could be affected by the contamination.
- Habitat that is important to the region that could be affected by the contamination.

- Contamination is in a park, preserve, or wildlife refuge.

*If any of the above boxes are checked, go on to the next scoping factor. If none are checked, end the evaluation and check the box below.*

- OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

#### **4. Contaminant Quantity**

*Check all that may apply. See Ecoscoping Guidance for additional help.*

- Endangered or threatened species are present.
- The aquatic environment is or could be affected.
- Non-petroleum contaminants may be present, or the total area of petroleum-contaminated surface soil exceeds one-half acre.

*If any of the above boxes are checked, go on to the next scoping factor. If none are checked, end the evaluation and check the box below.*

- OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments:

#### **5. Toxicity Determination**

*Check all that apply.*

- Bioaccumulative chemicals are present (see *Policy Guidance on Developing Conceptual Site Models*).
- Contaminants exceed benchmark levels (see the Ecological Benchmark Tool in RAIS, available at: [http://rais.ornl.gov/tools/eco\\_search.php](http://rais.ornl.gov/tools/eco_search.php)).

*If either box is checked, complete a detailed Ecological Conceptual Site Model (see DEC's Policy Guidance on Developing Conceptual Site Models) and submit it with the form to your DEC project manager.*

*If neither box is checked, check the box below and submit this form to your DEC project manager.*

OFF-RAMP: NO FURTHER ECOLOGICAL EVALUATION NECESSARY

Comments: