RAVN AIR ANC

4700 Old International Airport Road
Anchorage AK 99502

Site Characterization Report

ADEC File No. 2100.38.558

Rev 2.0

Prepared For:
Ms. Wendy Hansen
Alaska Department of
Environmental Conservation
555 Cordova Street
Anchorage, Alaska 99501
Phone: (907) 269-7525

Prepared By:
Restoration Science & Engineering, LLC
911 West 8th Avenue, Suite 100
Anchorage, Alaska 99501

Phone: (907) 278-1023
Fax: (907) 277-5718
www.restorsci.com

Arran Forbes, Environmental Scientist
Qualified Environmental Professional

David Nyman, P.E.

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Contents

Attachments:

1.0 Introduction

Restoration Science & Engineering, LLC is providing this report for the site characterization activities at the Anchorage International Airport (ANC) Ravn Alaska Aircraft Maintenance Facility in accordance with the May 3, 2017 Alaska Department of Environmental Conservation (ADEC)-approved work plan. RSE conducted the site assessment on behalf of Ravn to determine whether impacts to groundwater are detectable within the area of an October 2015 Jet-A fuel spill. Field activities were conducted on May 31, 2017.

The facility is located 4700 Old International Airport Road in Anchorage, Alaska, 99502, Lot 2, Block 3 Anchorage International Airport. The site is listed as ADEC file number 2100.38.558.

2.0 Objectives

Per correspondence received from Bill O'Connell of the ADEC on April 18, 2017, RSE conducted the referenced work to determine the horizontal and vertical extent of the Jet-A spill hydrocarbon impacts to soil, and determine whether groundwater had been impacted at the subject spill site.

To collect data representative of site conditions, the ADEC requested the installation of three (3) soil borings to be completed as monitoring wells at locations near exceedances detected during the 2015 corrective actions, with one (1) well situated to the north to calculate the groundwater flow direction. RSE initially prepared a work plan for previous ADEC manager Darren Mulkey requesting eight (8) soil borings with one sampled to groundwater. This course was modified by ADEC manager Bill O'Connell with the approach described above. Soil and groundwater samples collected from each borehole location requested by the ADEC is discussed in more detail in this report.

3.0 Site Background

In October 2015, a fuel leak from a faulty bottom outlet valve was discovered on a mobile tank (bowser) used to de-fuel aircraft undergoing maintenance. After discovering the release, Ravn personnel initially responded by hand-excavating impacted soil into a 55-gallon open-top drum and reporting the spill to the ADEC. On October 23, 2015, NRC Alaska LLC (NRC) continued spill response activities, obtaining public utility locates for planned excavation activities and working with Ravn personnel to move shipping containers and other stored materials from within the likely excavation footprint. The tank reportedly held a capacity of 1,000 gallons; approximately 830 gallons of jet fuel remained in the tank, indicating approximately 170 gallons were released.

At the request of NRC, RSE prepared a corrective actions work plan, dated October 27, 2015 and this plan was submitted by NRC to ADEC for approval shortly thereafter (RSE, 2015a). NRC received work plan approval from ADEC and also obtained ADEC transport approval for the contaminated soil to be direct hauled to Alaska Soil Recycling (ASR) for thermal remediation.

Initial site cleanup activities were conducted by NRC between October 27, 2015 and November 2, 2015. Spill cleanup activities were conducted in general accordance with the work plan prepared by RSE, although RSE was not on site until primary excavation activities were completed. Corrective action activities included removal of jet fuel impacted soil using an excavator and placing excavated material directly into end dump trucks for transport to ASR. The excavation extended to the property fence line to the east, and west and north along the spill pathway. The spill area is partially unsurfaced along the eastern side and the western side of the excavation was asphalt surfaced. Initial removal of impacted material depths ranged from 2 feet to 5 feet below ground surface (bgs). A total of 787 tons of material was hauled to ASR between October 27, 2015 and October 31, 2015.

On November 2, 2015, at the request of NRC, RSE Qualified Environmental Professional personnel arrived onsite to provide site field screening and closure sampling services in support of NRC's corrective action activities.

RSE field screening efforts indicated additional excavation was required to meet hydrocarbon cleanup standards. RSE continued additional field screening, and closure sampling activities from November 2 to November 4, 2015. Based on RSE photo-ionization detector (PID) field screening, NRC advanced the excavation to the west an additional 30 feet, until field screening results were near or under 50 parts per million by volume (ppmv). Additionally, the bottom of the excavation was deepened at localized depths of up to 8.5 feet bgs in areas that yielded elevated PID values. Figures depicting the site location, the excavation limits, and field screening and analytical samples locations are provided as Figure 2 in Attachment A. The total area of the final excavation limits was approximately 2,900 square feet; with final excavation depths

ranging from 2 feet to 8.5 feet bgs. Soil appeared to consist of very fine brown sand or brown silt and fine sand with gravel.

A total of 234 tons of additional material was hauled ASR between November 2 and November 4, 2015. Over the course of excavation activities, a total of 1,022 tons of soil was removed and transported to ASR. The excavation was backfilled on or around December 4, 2015.

The excavation initially remained open after the first analytical samples were collected. Preliminary results received on November 18, 2015 indicated that tetrachloroethene (PCE) and trichloroethene (TCE) were present, but these analytes were not anticipated by NRC, given that the spilled product was reportedly jet fuel. RSE notified NRC who in turn notified ASR of this finding.

All samples yielded concentrations of residual range organics (RRO), gasoline range organics (GRO), and benzene, toluene, ethylbenzene and xylenes (BTEX) that were either undetected or below the 2015 ADEC Method 2 cleanup levels. Concentrations of diesel range organics (DRO) were less than 2015 ADEC Method 2 cleanup level for all samples, except for sample RV-3. Sample RV-3, located on the southeast corner of the excavation sidewall, yielded a DRO result of 1,930 mg/Kg.

All initial VOC samples, except RV-24, yielded concentrations of PCE greater than the 2015 ADEC Method 2 Cleanup Level for migration to groundwater of 24 ug/Kg. In addition, Samples RV-54 and RV-119 yielded concentrations of TCE of 30.6 ug/Kg and 52.9 ug/Kg, respectively, greater than the 2015 ADEC Method 2 Cleanup Level for migration to groundwater of 20 ug/Kg. All other VOC concentrations were either undetected or below the ADEC Method 2 cleanup levels. PAH analysis did not yield any target compounds at concentrations greater than ADEC cleanup levels.

Based on detections of PCE and TCE, RSE collected additional VOC samples on November 25, 2015 prior to backfilling the excavation. Sample RV-3-1, located at the fence line on the east excavation sidewall, approximately 10 feet to the north of Sample RV-3, was also analyzed for DRO and RRO. Sample RV-3-1 yielded a DRO result of 4,880 mg/Kg. RRO results for sample RV-3-1 were less than the ADEC cleanup level.

VOC analysis for the November 25, 2015 sampling event yielded concentrations of PCE and TCE that exceeded 2015 Migration to Groundwater Standards. RSE updated tables from the 2015 site characterization report to compare these results to the current (2017) Migration to Groundwater Standards (Attachment B). Several analytes which exceeded applicable cleanup levels in 2015 are now below current (2017) standards; however, several analytes once below standards now exceed the 2017 standards. In general, however, the sample locations exhibiting

an exceedance are consistent when compared to the 2015 and 2017 cleanup standards. Only one sample location (RV-89) previously met the 2015 standards, but exceeded the 2017 standards for an analyte (1,2,4-trimethylbenzene). Comparison of the new standards against the historic data did not identify any new areas of the excavation that were not previously known to exceed at least one applicable soil cleanup standard in 2015.

Table 1, below, identifies the maximum concentration of analytes which exceed 2017 Migration to Groundwater Cleanup levels:

Table 1. 2015 Data Maximum Analyte Exceedances

Analyte	Maximum Concentration	Sample ID	2017 MTG Cleanup Standard
1,1,2-trichloroethane	30.1 ug/Kg	RV-3-1	1.4 ug/Kg
1,2-Dibromoethane	13.9 ug/Kg	RV-67	0.24 ug/Kg
1,2,4-trimethylbenzene	281 ug/Kg	RV-89	160 ug/Kg
Naphthalene	266 ug/Kg	RV-70	38 ug/Kg
Tetrachloroethene	2,620 ug/Kg	RV-3	190 ug/Kg
Trichloroethene	67.4 ug/Kg	RV-6A	11 ug/Kg
Diesel Range Organics	4,880 mg/Kg	RV-1-3	250 mg/Kg

4.0 Site Hydrogeology

Boring logs from environmental investigations north of the spill site indicate silty sand exists from 0 to 25 feet bgs, sandy fine silt is present from 25 feet bgs to 40 feet bgs, and silty sand is present from 40 feet to 60 feet bgs. Historic groundwater elevation data identifies groundwater at approximately 50 feet to 60 feet bgs, within the silty sand layer (Dames & Moore, 1998). RSE's boring log data is generally consistent with these findings, with clear delineations between previous fill zones and native silty soils.

Current information on Ravn spill site indicates the Jet-A impacts are located within the shallow vadose zone soil with residual impacts extending to depths of approximately 7 to 8 feet bgs in some areas. This residual soil contamination is set about 50 feet above the locally thin unconfined groundwater which overlies a series of semi-confined and confined aquifers. The first confined aquifer is located approximately 125 feet below the ground surface, and is confined by the Bootlegger Cove Formation. The Bootlegger Cove Formation largely consists of silty clay with fine sand within the airport area (RSE, September 2003).

A Section 350 Groundwater use determination has been issued by ADEC for specific areas within the airport. This determination found the first unconfined groundwater zone to not be

connected to the deeper groundwater aquifer and that the first unconfined groundwater zone is not used as a drinking water supply and therefore, alternative cleanup levels may apply.

Review of multiple contaminated sites within the ANC Complex indicate the groundwater gradient within the project area is generally to the west toward Cook Inlet. Investigations completed by URS in 2001 indicate the groundwater gradient adjacent to the project site is west-southwest (URS, February 2001). Determining the groundwater gradient within the ANC complex is highly variable due to the presence of perched unconfined and semi-confined aquifers within the area. These groundwater zones are not always connective, and inferring flow direction from discrete groundwater monitoring well locations in some cases provides inconsistent results due to localized conditions within a particular well network.

A groundwater gradient survey was not conducted as part of the scoped work due to the temporary nature of the wells. However, available elevation data indicates the groundwater is generally more shallow to the east, and is encountered at greater depths moving west, consistent with known groundwater flow patterns in the area.

Groundwater within nearby locations north of the Ravn site is typically hydrocarbon-impacted from aviation and fuel storage activities within the airport. Records from groundwater monitoring wells north-northwest of the site indicate historic groundwater impacts of BTEX, DRO, and GRO.

5.0 Contaminants of Potential Concern

Based upon the known release of Jet-A fuel, previous environmental work as described above, and the ADEC Field Sampling Guidance, Tables 2 and 3 provide a listing of contaminants of potential concern (COPCs) identified for this project.

Table 2. COPCs in Soil

COPC	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Soil Cleanup Level
Gasoline Range Organics	GRO	AK 101	300 mg/Kg
Diesel Range Organics	DRO	AK 102	250 mg/Kg
Benzene	Collectively referred to as BTEX	EPA 8260	0.022 mg/Kg
Toluene			6.7 mg/Kg
Ethylbenzene			0.13 mg/Kg
Total Xylenes			1.5 mg/Kg
Polycyclic Aromatic Hydrocarbons	PAHs	EPA 8270D	Varies Naphthalene 0.038 mg/Kg
Volatile Organic Compounds	VOCs	EPA 8260C	Varies Trichloroethene 11 ug/Kg Tetrachloroethene 190 ug/Kg 1.1,2-Trichloroethane 1.4 ug/Kg 1,2-Dibromoethane 0.24 ug/Kg 1,2,4 Trimethylbenzene 160 ug/Kg

Table 3. COPCs in Groundwater

COPC	Matrix	COPC Abbreviation	ADEC-Approved Lab Method	ADEC Method 2 Groundwater Cleanup Level
Gasoline Range Organics	Water	GRO	AK 101	2.2 mg/L
Diesel Range Organics	Water	DRO	AK 102	1.5 mg/L
Benzene	Water	Collectively referred to as BTEX	EPA 8260	4.6 ug/L
Toluene	Water			1,100 ug/L
Ethylbenzene	Water			15 ug/L
Total Xylenes	Water			190 ug/L
Polycyclic Aromatic Hydrocarbons	Water	PAH SIMS	EPA 8270D	Varies
Volatile Organic Compounds	Water	VOCs	EPA 8260	Varies

6.0 Investigation Methods

RSE has provided a figure (Attachment A, Figure 3) showing the boring and monitoring well locations. Sample locations were selected based upon results of the November 2015 corrective actions where exceedances of COPCs were detected in soil remaining in-situ and as discussed with the ADEC on April 18, 2017.

RSE collected soil field screening samples from the soil borings generally at 2 foot depth intervals with the exception of the upper 2 feet so as to avoid cross surface impacts from asphalt surfacing, and at depths beyond 30 feet bgs where homogenous fine sandy silt yielded uniform non-detect field screening readings, and drives were conducted at 4 foot intervals.

Borings were installed using a CME 75 hollow stem auger. Using utility locate information, existing infrastructure, and communications with the ADEC, RSE directed the driller to locations providing the most representative data to satisfy project objectives. RSE located all sample locations via use of electronic distance measuring equipment and swing ties to site features. Photographs of sample locations and select depth intervals are included as Attachment C to this report. Boring logs are included as Attachment D to this report. Sample locations are shown on Figure 3, attached.

Soil samples submitted for laboratory analysis were analyzed for DRO, GRO, and VOCs. Samples exhibiting the highest field screening readings and/or indicators of potential impacts were submitted for PAH SIMS soil analysis at a 10% frequency. Groundwater samples were analyzed for DRO, GRO, VOCs and PAHs. Methodologies are discussed further below.

A copy of the field notes are included as Attachment E to this report.

6.1 Field Screening

RSE field personnel conducted field screening using a PID containing an 11.7 eV lamp, which is typically effective for screening for VOCs including TCE and PCE, in addition to heavy hydrocarbons. RSE collected soil field screening samples directly from the split spoon with the exception of the upper 2 foot horizon. Samples were collected using a clean stainless steel spoon or nitrile gloved hand and placed into a Ziploc™ quart-sized bag. Field personnel warmed the bag to approximately 60° F, and measured the head space within the bag using an 11.7 eV lamp PID. Stainless steel spoons were decontaminated at the conclusion of field activities using Alconox wash and distilled water rinse. RSE field personnel noted the sample ID, location, depth, soil type, and the PID reading for each sample location, included as Table 1, Attachment B, and in boring logs provided in Attachment E.

6.2 Soil Sample Collection

Soil samples were collected for laboratory analysis from each soil boring from the depth intervals yielding the highest PID readings, at the groundwater interface or saturated zone, and, at boring locations RSE-1 and RSE-2, from suspected clean soil at the depths that field-screening indicating the lower vertical boundary of hydrocarbon impacts had been reached. Soil samples were collected using clean stainless-steel spoons into method-specific containers provided by the contract laboratory. Blind duplicate samples were collected and submitted for each analytical method on a 10% frequency; a total of eight (8) primary samples were collected, and one (1) duplicate sample was submitted.

Soil samples were collected using a dedicated stainless-steel spoon and placed into method specific containers, stored in a clean sample cooler chilled to between 0 and 6 °C, and transported under chain-of-custody to ADEC-approved laboratory SGS North America in Anchorage. Table 4 presents analytical method sample jars, preservatives, and holding times.

Table 4. Containers, Preservation, and Holding Times for Soil Samples

COPC	Matrix	Lab Method	Sample Container	Preservation	Holding Time
GRO	Soil	AK 101	1x 4 oz. amber jar with Teflon lined cap with septum	MeOH 0 – 6° C	MeOH preserved, <28 days to analysis
DRO	Soil	AK 102	1x 4 oz. amber jar with Teflon lined cap	0 – 6° C	14 days to extract, <40 days to analysis
VOCS	Soil	EPA 8260	1x 4 oz. amber jar with Teflon lined cap with septum	MeOH 0 – 6° C	MeOH preserved, <14 days to analysis
PAH SIMS[1]	Soil	EPA 8270D	1x 4 oz. amber jar with Teflon lined cap	0 – 6° C	14 days to extract, <40 days to analysis

[1]PAH samples collected at a minimum 10% frequency

6.3 Monitoring Well Installation

The three (3) soil borings were completed as temporary groundwater monitoring wells. Field screening results indicated that the depth of groundwater was likely beyond the extent of Jet-A impacts, and the wells were decommissioned immediately after sampling.

The monitoring wells were installed in general accordance with ADEC Monitoring Well Guidance (ADEC, September 2013), consisting of a commercially manufactured 20-slot intake PVC well screen placed directly into the borehole. Temporary wells were installed to approximately 60 feet bgs for the three wells, with the depth to water varying between 54 feet bgs and 51 feet bgs. Field measurements are included in Table 5 of Attachment B to this report. Each temporary well had a screen length of ten feet, with the screen extending at least 3 feet

above the depth where water was encountered at the time of drilling. Temporary wells were removed after sampling and the boreholes were backfilled with bentonite. The boreholes were sealed with cold patch asphalt to grade. Borehole logs with well construction details are included as Attachment D to this report.

Monitoring well purging and sampling were informed by EPA Low Flow (minimal draw down) Groundwater Sampling Procedures (EPA/540/S-95/504, April 1996). Water samples were collected using a variable speed submersible pump set to a low flow rate during purging and sampling. Prior to purging the depth to water was measured with a water level indicator. The wells were generally run dry during purging, with gradual recharge to within 20% of static levels. RSE collected field parameters with a YSI water quality probe. These parameters included temperature, specific conductance, salinity, and pH. However, due to the drying out of the wells, water collected for sampling was believed to be representative of surrounding conditions regardless of water quality parameter stabilization or well volumes purged.

Groundwater samples were collected using new tubing for each well. The submersible pump was placed in the middle of the screened section. As water samples were collected, care was taken minimize volatile loss by minimizing excessive turbulence or air mixing. Water samples were analyzed for COPCs including DRO, GRO, VOCs and PAH SIMs. Water samples were placed directly into method specific containers and stored in a clean sample cooler chilled to between 0º and 6° C transported under chain-of-custody to SGS North America. One (1) duplicate water sample was collected from RSE-1 and submitted blind to the laboratory for each analysis performed. Table 5 provides the containers, preservation, and holding times for the groundwater samples.

Table 5. Containers, Preservation, and Holding Times for Groundwater Samples

COPC	Matrix	Lab Method	Sample Container	Preservation	Holding Time
GRO	Water	AK 101	3x40-ml volatile organic analysis (VOA) septum vials, minimize headspace	HCl 0 – 6° C	14 days
DRO	Water	AK 102	2x 250 mL amber glass Teflon-lined cap	HCl 0 – 6° C	7 days to extract, <40 days to analysis
VOCs	Water	EPA 8260	3x40 ml Volatile organic analysis (VOA) vials, minimize headspace	HCl 0 – 6° C	14 days
PAH SIMS	Water	EPA 8270D	2x 250 mL amber glass Teflon-lined cap	0 – 6° C	14 days to extract, <40 days to analysis

7.0 Investigative Derived Waste

Consumables such as plastic bags, gloves and used jars were placed into a trash receptacle for disposal. Non-consumables such as spoons and other field equipment were decontaminated using Alconox and hot water at RSE's equipment room in Anchorage. Tubing for water samples was be disposed of following use.

Soil cuttings generated were containerized in sealed and labeled 55-gallon drums stored onsite pending receipt of data and ADEC approved disposal. The soil remains onsite as of September 2017. RSE has included an ADEC Approval to Transport form to this report to request transport and treatment of the soil at ASR.

Purge water from the groundwater sampling effort was stored onsite in sealed and labeled containers pending laboratory analysis for ADEC-approved disposal. It remains onsite as of September 2017. RSE requests discharging this water through a carbon filter to a vegetated area on site.

8.0 Results

Tabulated data tables are included in Attachment B to this report. The complete SGS laboratory report is included as Attachment G.

Soil

Results for soil indicated that hydrocarbon impacts are generally present within the upper 6 feet bgs of the subject area. Higher concentrations of impacts were detected on the east side of the security fence, outside of the spill area documented in 2015.

RSE-1, located on the east side of the fence, yielded a maximum result of 3,230 mg/Kg DRO at a depth interval of 6 feet to 8 feet bgs. This DRO result rapidly attenuated by the 10 feet to 12 feet interval, with a result of 10.1 mg/Kg, with no further impacts detected in soil up to the terminal depth of 54 feet to 58 feet bgs, with an estimated (J-flagged) result of 12.1 mg/Kg DRO. Two VOC analytes yielded results exceeding ADEC cleanup standards: naphthalene and trichloroethene in the upper strata up to 12 feet bgs. No VOC detections were reported at the soil-water interface at 54 feet to 56 feet.

RSE-2, located on the north side of the spill area described in the ADEC file, yielded a maximum result of 1,920 mg/Kg DRO at a depth interval of 2 feet to 4 feet bgs. This result decreased to 19.3 mg/Kg DRO at the 6 feet to 8 feet depth interval, with no further impacts detected in soil to the terminal depth of 58 feet to 62 feet bgs, with an estimated (J-flagged) result of 12.0 mg/Kg DRO. Two VOC analytes yielded results exceeding ADEC cleanup standards in the upper 4 feet: 1,2,4-trimethylbenzene and naphthalene. No VOC detections were reported at the soil-water interface at 58 feet to 62 feet.

RSE-3, located on the south side of the spill area described in the ADEC file, did not report exceedances for DRO. Two exceedances for VOCs were reported in the upper 10 feet to 12 feet bgs: naphthalene and trichloroethene. The DRO result at the soil-water interface was reported as an estimated value of 12.8 mg/Kg. No detections for VOCs were reported at the soil-water interface at 52 feet to 54 feet bgs.

PAHs were uniformly detected in all surficial sample locations submitted for analyses. Exceedances were reported in each of the three submitted samples for 1-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, and naphthalene. PAH samples were submitted from locations exhibiting the greatest field screening readings; no PAH samples were submitted from depths greater than 8 feet bgs.

Groundwater
RSE-1 yielded the only detection for DRO, with an estimated reported value (J-flag) of 0.193 mg/L compared to a cleanup standard of 1.5 mg/L. The duplicate sample submitted with this parent sample was non-detect for DRO. Additional groundwater wells were non-detect for DRO, GRO, and BTEX.

Each of the wells yielded low-level detections of VOC analytes bromodichloromethane and chloroform. Each of these detectable results is J-flagged and considered an estimated value. None of the reported concentrations approach ADEC cleanup levels.

Each well yielded low-level detections for PAH compounds, all substantially below ADEC cleanup levels.

9.0 Quality Assurance and Quality Control

All site characterization tasks were conducted by an RSE Qualified Environmental Professional. Each soil and groundwater sample were collected in general accordance with 18 AAC 75 and applicable ADEC regulations and guidance documents. Blind duplicate samples were collected at 10% frequency for a total of one (1) duplicate sample for soil and one (1) duplicate sample for groundwater. The relative percent difference (RPD) calculated for soil was within ADEC-specified data quality objectives. The RPD for water did not meet the DQO standard, with the parent result yielding a detection for DRO and the duplicate result non-detect. For comparison against cleanup standards, the detectable result is used. This result is below ADEC cleanup standards.

RSE submitted one (1) trip blank for soil and one (1) groundwater media in the sample cooler. The trip blanks were recorded on the chain of custody and analyzed by the contract laboratory. The trip blank for soil media yielded three (3) low level detections, without comparable effect seen in primary samples. Affected analytes were generally non-detect in primary samples. No

evidence of interference or bias from transport was observed in the data. No results were detected in the trip blank for water.

RSE has completed sample data quality assurance review and the ADEC Laboratory Review checklist for each laboratory report received.

Several minor deviations from the work plan were noted during site assessment activities, none of which are believed to affect data quality or usability, or impact achievement of project objectives. These include:

- Cuttings were not replaced into the borehole of origin due to elevated field screening readings indicating potential impacts.
- Surging of the wells was not conducted with a bailer due to the depth of the wells and use of the submersible pump.
- Stabilization of water quality parameters were not achieved for all three wells due to the dry out of groundwater and subsequent confidence that water samples were drawing directly from the adjacent formation.
- Groundwater depth measurements were collected from the top of casing of the temporary well, which was flush with the ground surface except at RSE-1 where the well was recessed 4 inches below grade.
- At depths greater than 30 feet bgs, RSE directed drillers to collect drives at 4 foot intervals rather than 2 foot intervals. Field screening results consistently indicated homogenous dense soil with no evidence of impacts (readings of 0.0 ppmv). In the interest of efficiency and minimizing redundancy, drive intervals were increased to collect data up to the groundwater interface.
- Field screening results did not indicate that step-outs were necessary, as no significant or novel findings were encountered during the drilling program. Field screening readings were typically consistent with expectations derived from previous knowledge of the site and did not indicate an unknown source area or unexamined area of concern.

Data with method detection limits greater than ADEC cleanup levels have been flagged in the tables included in Attachment 2. Tables 6 and 7 outline the method-specific quality assurance targets.

Table 6. Quality Assurance Targets for Soil

COPC	ADEC/EPA Approved Lab Method	Detection Limits (DL)	Limit of Detection (LOD)	Limit of Quantitation (LOQ)	Recovery Limits (%)	Relative Percent Difference (RPD) Limit (%)
Petroleum Hydrocarbons						
DRO	AK 102	6.2 mg/Kg	10 mg/Kg	20 mg/Kg	75-125	20
GRO	AK 101	0.31 mg/Kg	0.05 mg/Kg	0.1 mg/Kg	60-120	20
VOCs	EPA 8260	Varies – See attachment C				
PAHs	EPA 8270	Varies – See attachment C				

Table 7. Quality Assurance Targets for Groundwater

COPC	ADEC/EPA Approved Lab Method	Detection Limits (DL)	Limit of Detection (LOD)	Limit of Quantitation (LOQ)	Recovery Limits (%)	Relative Percent Difference (RPD) Limit (%)
Petroleum Hydrocarbons						
DRO	AK 102	0.18 mg/L	0.3 mg/L	0.6 mg/L	60-120	20
GRO	AK 101	0.31 mg/L	0.05 mg/L	0.1 mg/L	60-120	20
VOCs	EPA 8260	Varies – See attachment C				
PAHs	EPA 8270	Varies – See attachment C				

10. Conclusions and Recommendations

Results of the investigation confirm previous findings from the site: the upper 10 feet bgs of the site, both within the former spill area and more diffusely across the area, contain hydrocarbon impacts consistent with historic use as an aircraft storage, maintenance, and fueling area. No impacts to groundwater were observed during the site investigation, and soil data and field screening indicates that the impacts are surficial and restricted by layers of silt present below the fill material and native gravelly sands in the area. The impacted soil and soil-water interface are separated by approximately 50 feet of dense silt. No vertical migration pathway for in-situ Jet-A impacts was identified.

RSE has completed an updated Conceptual Site Model (CSM) for the RAVN Air ANC site, included as Attachment J to this report. RSE has considered Migration to Groundwater and Human Health exposure limits in preparing the CSM. Of the pathways evaluated, soil and air are complete pathways due to the presence of exceedances in soil at depths between 0 and 10 feet bgs. However, the receptor potential is minimal. If RAVN paves the subject area, as they intend to do, soil contact would be limited only to those workers who may conduct future earthwork in

the area. Known conditions and industrial uses at the site indicate the exposure to commercial, industrial, and/or construction workers is insignificant.

Consistent with the 18 AAC 75.350 Determination for Anchorage International Airport, the soil impacts observed at the subject property are not migrating to groundwater and hence do not pose a risk for offsite migration. It is RSE's professional opinion that the subject file is eligible for cleanup complete status with existing institutional controls applicable. The property owner is seeking to pave the spill area with asphalt. Based upon the industrial use of the subject area, the 18 AAC 75.350 Determination in place, RSE does not believe such an action poses a threat to human health or the environment and requests the ADEC allow for paving of the former spill area.

Please contact Arran Forbes at 278-1023 ext. 109, if you have any questions or comments.

This report was prepared by a qualified environmental professional in accordance with 18 AAC 75/78.

Arran Forbes, Environmental Scientist, QEP

David Nyman, PE

cc: Terry French, Ravn

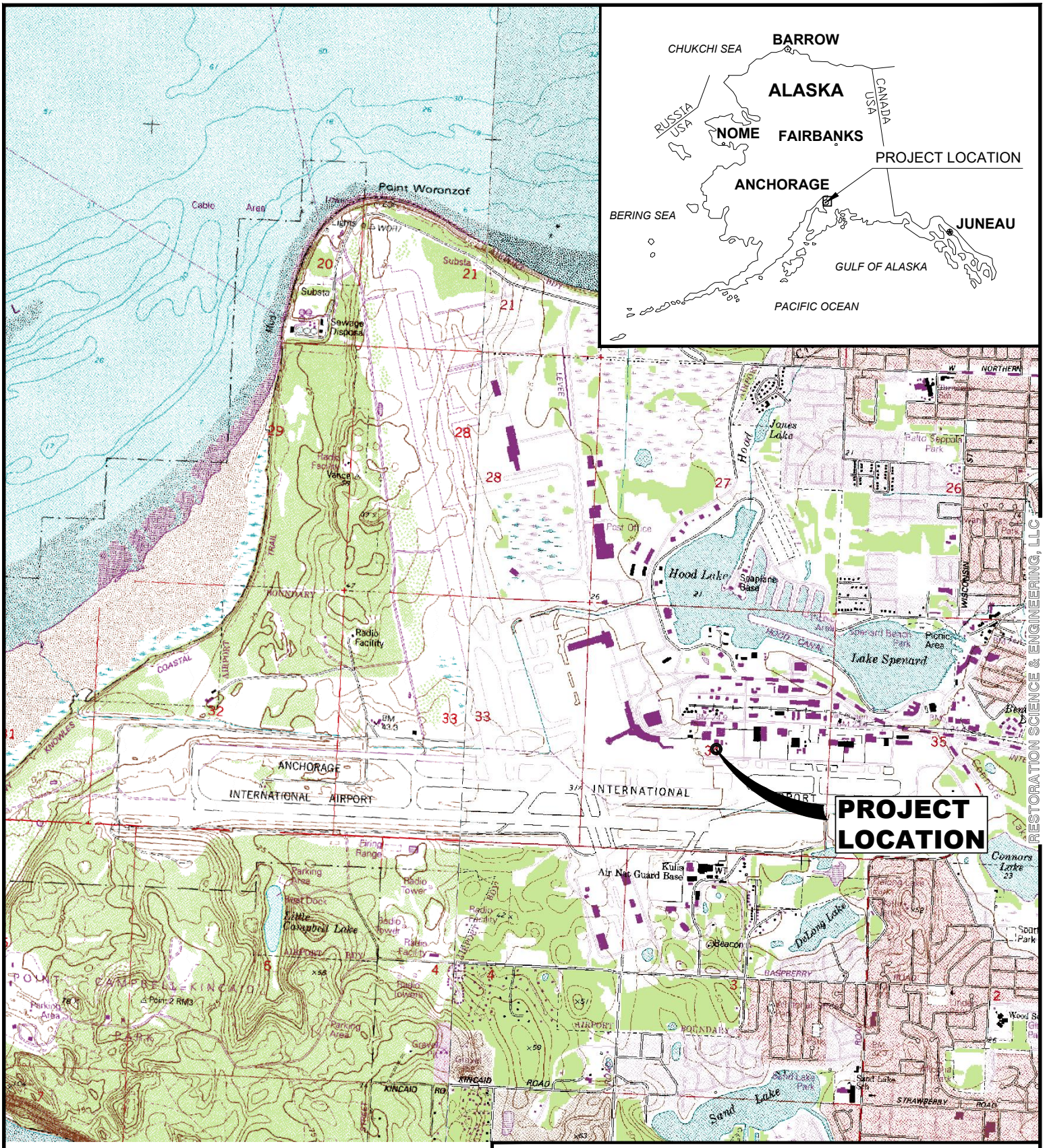
Attachments:
Attachment A – Figures
Attachment B – May 31, 2017 Data
Attachment C – Select Site Photographs
Attachment D – Boring Logs
Attachment E – Copy of Field Notes
Attachment F – Quality Assurance and Control Checklist
Attachment G – SGS Data Package
Attachment H – ADEC Approval to Transport Form
Attachment I – Arran Forbes Resume
Attachment J – Conceptual Site Model
Attachment K – RSE Response to Comments

References

RSE 2015a. Corrective Actions Work Plan for ADEC Spill Name "Bouser leaking Raven Aviation" located at the "Anchorage Airport Field Maintenance Equipment Shop". ADEC Spill Number 15239929501. Revision 1.1

RSE 2015b. Corrective Actions Report for AIA RAVN Alaska Airport Maintenance Facility, ADEC File No. 2100.38.558, Hazard ID #26474, Formerly ADEC Spill "Bowser leaking Raven Aviation" ADEC Spill Number 15239929501.

Attachment A: Figures



N.T.S.

RAVN AIR JET FUEL RELEASE

ANCHORAGE AIRPORT FIELD MAINTENANCE EQUIPMENT SHOP

VICINITY MAP

ANCHORAGE, ALASKA

JOB NO: 16-1636	DRAWN: MSB
DATE: 8.1.2017	CHECKED: AF/DN

RESTORATION Science & Engineering, LLC
911 West 8th Avenue, Suite 100
Anchorage, Alaska 99501
PH (907) 278-1023 FAX (907) 277-5718

FIGURE 1

LOT F

INTERNATIONAL AIRPORT ROAD

OLD INTERNATIONAL AIRPORT ROAD

RAVN AIR CARGO

RAVN MAINTENANCE BUILDING

INTL ARPT BLK 3 LT 6

SOUTH AIRCRAFT DRIVE

AST SYSTEM

APPROXIMATE EXCAVATION LIMITS

GUARD HOUSE

SITE TRAILER

INTL ARPT BLK 3 LT 12

PROPERTY BOUNDARY

EDGE OF ASPHALT PAVEMENT

EDGE OF ASPHALT PAVEMENT

NORTH TUG ROAD

TAXIWAY K

LEGEND

EXISTING BUILDING

EXCAVATION LIMITS

FENCE

5 0 10

GRAPHIC SCALE
1"=10'

RAVN AIR JET FUEL RELEASE

ANCHORAGE AIRPORT FIELD MAINTENANCE EQUIPMENT SHOP

SITE MAP
TED STEVENS INTERNATIONAL AIRPORT
INTL ARPT BLOCK 3 LOT 12

ANCHORAGE, ALASKA

RESTORATION Science & Engineering, LLC
911 West 8th Avenue, Suite 100
Anchorage, Alaska 99501
PH (907) 278-1023 FAX (907) 277-5718

JOB NO: 16-1636	DRAWN: MSB
DATE: 8.1.2017	CHECKED: NB/DN/CB

FIGURE 2

INTL ARPT
BLK 3 LT 12

TO HANGAR
(60' FROM RSE - 2)

RSE - 2

FENCE LINE AND LEASE BOUNDARY

EDGE OF ASPHALT PAVEMENT

INTL ARPT
BLK 3 LT 6

APPROXIMATE EXCAVATION LIMITS

AREA EXCAVATED
FROM 11-2-2015 TO 11-4-2015

PRIMARY AREA EXCAVATED
PRIOR TO 11-2-2015

DEPTH = 6.5' - 8.5'

DEPTH = 4'

DEPTH = 18"

DEPTH = 6'

RSE - 1

RSE - 3

RV-1

RV-3-1

SITE TRAILER

GRAVEL SURFACE

APPROXIMATE
EDGE OF ASPHALT PAVEMENT
(BEFORE EXCAVATION)

NORTH TUG ROAD

LEGEND

- FIELD SCREENING SAMPLE LOCATION
- ANALYTICAL SAMPLE LOCATION LESS THAN ADEC CLEANUP LEVELS
- 2015 DATA EXCEEDED ADEC CLEANUP LEVELS FOR ONE OR MORE VOC ANALYTE
- 2015 DATA EXCEEDED ADEC CLEANUP LEVELS FOR DRO AND ONE OR MORE VOCs
- 2017 SOIL BORING LOCATION & TEMPORARY MONITORING WELL LOCATION
- EXCAVATION LIMITS
- FENCE

5 0 10

GRAPHIC SCALE
1"=10'

RAVN AIR JET FUEL RELEASE

ANCHORAGE AIRPORT FIELD MAINTENANCE EQUIPMENT SHOP

2015 CORRECTIVE ACTIONS & 2017 SITE ASSESEMENT
SAMPLE LOCATION MAP
TED STEVENS INTERNATIONAL AIRPORT
INTL ARPT BLOCK 3 LOT 12

ANCHORAGE, ALASKA

JOB NO: 16-1636	DRAWN: MSB
DATE: 8.1.2017	CHECKED: AF/DN

RESTORATION
Science & Engineering, LLC
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PH (907) 278-1023 FAX (907) 277-5718

FIGURE 3

Attachment B: May 31, 2017 Data

RESTORATION
Science & Engineering, LLC

TABLE 1
Field Screening Results RSE-1
RAVN Air Site Assessment
Report Date March 2018

FIELD SCREENING RESULTS RSE-1				
SAMPLE ID	**DATE**	**DEPTH (FEET)**	**PID (PPMV)**	**NOTES**
		PID Readings		
1	5/31/2017	0-2	NA	Not analyzed, asphalt and D-1 subgrade.
2	5/31/2017	2-4	8.8	Dark Brown Sand, HC odor.
3	5/31/2017	4-6	7.5	Dark Brown Sand, HC odor.
4	**5/31/2017**	**6-8**	**10.0**	**Dark Brown Sand, HC odor.**
5	5/31/2017	8-10	4.2	Dark Brown Sand, HC odor.
6	**5/31/2017**	**10-12**	**0.6**	**Light brown, extremely fine sand.**
7	5/31/2017	12-14	0.2	Light brown, extremely fine sand.
8	5/31/2017	14-16	0.2	Light brown, extremely fine sand.
9	5/31/2017	16-18	0.0	Dense light brown silt.
10	5/31/2017	18-20	0.0	Dense light brown silt.
11	5/31/2017	20-24	0.0	Dense dark brown silt.
12	5/31/2017	24-28	0.0	Dense dark brown silt.
13	5/31/2017	28-32	0.0	Dense dark brown silt.
14	5/31/2017	32-36	0.0	Dense dark brown silt.
15	5/31/2017	36-40	0.0	Transition to dark clayey silt.
16	5/31/2017	40-44	0.0	Clayey silt, moist.
17	5/31/2017	44-48	0.0	Clayey silt, moist.
18	5/31/2017	48-52	0.0	Clayey silt, moist.
19	5/31/2017	52-54	0.0	Clayey silt, wet.
20	**5/31/2017**	**54-58**	**0.0**	**Clayey silt, wet.**

NOTES:

1) Field-screening measurements collected using a RAE Systems 11.2 eV MiniRAE Lite photo-ionization detector

2) "PPMV" means "parts per million by volume"

3) Bold text and gray highlighting indicates the sample was submitted for laboratory analyses

TABLE 1
Field Screening Results RSE-2
RAVN Air Site Assessment
Report Date March 2018

FIELD SCREENING RESULTS RSE-2				
SAMPLE ID	DATE	DEPTH (FEET)	PID (PPMV)	NOTES
		PID Readings		
1	**5/31/2017**	**2-4**	**22.8**	**Gravelly sand, HC odor.**
2	5/31/2017	4-6	12.3	Gravelly sand, HC odor.
3	**5/31/2017**	**6-8**	**2.3**	**Sandy silt.**
4	5/31/2017	8-10	2.2	Sandy silt.
5	5/31/2017	10-12	1.7	Sandy silt.
6	5/31/2017	12-14	0.9	Dense, dark sandy silt.
7	5/31/2017	14-16	0.0	Dense, dark sandy silt.
8	5/31/2017	16-18	0.0	Dense, dark sandy silt.
9	5/31/2017	18-20	0.0	Dense, dark sandy silt.
10	5/31/2017	20-24	0.0	Dense, dark sandy silt.
11	5/31/2017	24-28	0.0	Dense, dark sandy silt.
12	5/31/2017	28-30	0.0	Dense, dark sandy silt.
13	5/31/2017	30-34	0.0	Dense, dark sandy silt.
14	5/31/2017	34-38	0.0	Dense, dark sandy silt.
15	5/31/2017	38-42	0.0	Transition to dark clayey silt.
16	5/31/2017	42-46	0.0	Clayey silt.
17	5/31/2017	46-50	0.0	Clayey silt.
18	5/31/2017	50-54	0.0	Clayey silt, moist.
19	5/31/2017	54-58	0.0	Sandy silt, wet.
20	**5/31/2017**	**58-62**	**0.0**	**Sandy silt, wet.**

NOTES:

1) Field-screening measurements collected using a RAE Systems 11.2 eV MiniRAE Lite photo-ionization detector

2) "PPMV" means "parts per million by volume"

3) Bold text and gray highlighting indicates the sample was submitted for laboratory analyses

TABLE 1
Field Screening Results RSE-3
RAVN Air Site Assessment
Report Date March 2018

FIELD SCREENING RESULTS RSE-3				
SAMPLE ID	**DATE**	**DEPTH (FEET)**	**PID (PPMV)**	**NOTES**
		PID Readings		
1	5/31/2017	2-4	0.0	Sandy gravel fill.
2	5/31/2017	4-6	0.0	Sandy gravel fill.
3	5/31/2017	6-8	0.0	Sandy gravel fill.
4	5/31/2017	8-10	0.0	Sandy gravel fill.
5	**5/31/2017**	**10-12**	**0.4**	**Dense, dark sandy silt.**
6	5/31/2017	12-14	0.0	Dense, dark sandy silt.
7	5/31/2017	14-16	0.1	Dense, dark sandy silt.
8	5/31/2017	16-18	0.0	Dense, dark sandy silt.
9	5/31/2017	18-20	0.0	Dense, dark sandy silt.
10	5/31/2017	20-22	0.0	Dense, dark sandy silt.
12	5/31/2017	22-24	0.0	Dense, dark sandy silt.
13	5/31/2017	24-26	0.0	Dense, dark sandy silt.
14	5/31/2017	26-28	0.0	Dense, dark sandy silt.
15	5/31/2017	28-30	0.0	Dense, dark sandy silt.
16	5/31/2017	30-32	0.0	Dense, dark sandy silt.
17	5/31/2017	32-34	0.0	Dense, dark sandy silt.
18	5/31/2017	34-36	0.0	Transition to dark clayey silt.
19	5/31/2017	36-38	0.0	Clayey silt.
20	5/31/2017	38-40	0.0	Clayey silt.
21	5/31/2017	40-42	0.0	Clayey silt.
22	5/31/2017	42-44	0.0	Clayey silt.
23	5/31/2017	44-46	0.0	Clayey silt.
24	5/31/2017	46-48	0.0	Clayey silt.
25	5/31/2017	48-50	0.0	Sandy silt, damp.
26	5/31/2017	50-52	0.0	Sandy silt, damp.
27	**5/31/2017**	**52-54**	**0.0**	**Sandy silt, wet.**

NOTES:

1) Field-screening measurements collected using a RAE Systems 11.2 eV MiniRAE Lite photo-ionization detector

2) "PPMV" means "parts per million by volume"

3) Bold text and gray highlighting indicates the sample was submitted for laboratory analyses

5) Sample 11 skipped due to field error

TABLE 2
Hydrocarbons in Soil
RAVN Air Site Assessment
Report Date March 2018

HYDROCARBONS IN SOIL											
SAMPLE ID	**DATE**	**DEPTH (FEET)**	**PID (PPMV)**	**TOTAL SOLIDS (%)**	**DIESEL RANGE ORGANICS (mg/Kg)**	**GASOLINE RANGE ORGANICS (mg/Kg)**	**BENZENE (µg/Kg)**	**TOLUENE (µg/Kg)**	**ETHYL-BENZENE (µg/Kg)**	**TOTAL XYLENES (µg/Kg)**	**SGS WORK ORDER NO.**
RSE-1-4	5/31/2017	6-8	10.0	94.2	**3230**	**20.3**	*6.00 U*	19.0 J	23.1 J	47.7 J	
RSE-1-6	5/31/2017	10-12	0.6	87.1	10.1 J	*1.41 U*	*7.05 U*	*14.1 U*	*14.1 U*	*42.4 U*	
RSE-1-20	5/31/2017	54-58	0.0	78.8	12.1 J	*2.29 U*	*11.4 U*	*22.9 U*	*22.9 U*	*68.5 U*	
RSE-2-1	5/31/2017	2-4	22.8	94.1	**1920**	38.2	*8.75 U*	**53.7**	**48.4**	**107**	
RSE-2-3	5/31/2017	6-8	2.3	84.5	19.3 J	1.13 J	*8.80 U*	*17.6 U*	*17.6 U*	*52.5 U*	11772844
RSE-2-20	5/31/2017	58-62	0.0	77.7	12.0 J	2.02 U	*10.1 U*	*20.2 U*	*20.2 U*	*60.5 U*	
RSE-3-5	5/31/2017	10-12	0.4	86.2	12.9 J	0.947 J	*6.95 U*	17.7 J	24.7 J	45.2 J	
RSE-3-27	5/31/2017	52-54	0.0	77.8	12.8 J	2.16 U	*10.8 U*	*21.6 U*	*21.6 U*	*65.0 U*	
RSE-X	5/31/2017	--	--	93.8	**3170**	**46.9**	*7.20 U*	21.3 J	**28.8**	58.7 J	
ADEC Method 2 - Table B1 & B2 Migration to Groundwater (18 AAC 75)					**250**	**300**	**22**	**6,700**	**130**	**1,500**	
ADEC Method 2 - Table B1 & B2 Under 40-inch Zone Human Health (18 AAC 75)[8]					**10,250**	**1,400**	**11,000**	**200,000**	**49,000**	**57,000**	

1) DRO samples analyzed by AK Method 102; RRO by AK Method 103; GRO samples analyzed by AK Method 101; BTEX samples analyzed by EPA 8021B
2) "mg/Kg" means "milligrams per kilogram"; "ug/Kg" means "micrograms per kilogram"; ppmv means "parts per million by volume"
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL)
4) Yellow highlighting indicates the analyte was detected above the ADEC Method 2 - Soil Cleanup Level for Migration to Groundwater
5) Organge highlighting indicates the analyte was detected about the ADEC Method 2 - Soil Cleanup Level for Human Health
6) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ
7) *Italicized* font with a U-qualifier indicates the analyte was not detected above the Detection Limit; the value presented is theLimit of Detection (LOD)
8) RSE-X is a blind duplicate of RSE-1-4
9) Petroluem Hydrocarbon soil cleanup levels for human health are provided under ingestion standards as the most stringent values.

TABLE 3
Volatile Organic Compounds (VOCs) in Soil
RAVN Air Site Assessment
Report Date March 2018

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN SOIL										
SAMPLE ID	RSE-1-4	RSE-1-6	RSE-1-20	RSE-2-1	RSE-2-3	RSE-2-20	RSE-3-5	RSE-3-27	**ADEC Method 2 Soil Cleanup Level For Migration to Groundwater (µg/Kg)**	**ADEC Method 2 Soil Cleanup Level For Under 40 inch Zone - Human Health (µg/Kg)**
Date	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017	5/31/2017		
Sample Depth (ft)	6-8	10-12	54-58	2-4	6-8	58-62	10-12	52-54		
SGS Work Order	11772844	11772844	11772844	11772844	11772844	11772844	11772844	11772844		
Percent Solids	94.2	87.1	78.8	94.1	84.5	77.7	86.2	77.8		
Units	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)		
1,1,1,2-Tetrachloroethane	*9.65 U*	*11.3 U*	*18.3 U*	*14.1 U*	*14.1 U*	*16.2 U*	*11.1 U*	*17.3 U*	22	21,000
1,1,1-Trichloroethane	*12.1 U*	9.88 J	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	32,000	360,000
1,1,2,2-Tetrachloroethane	*6.00 U*	*7.05 U*	*11.4 U*	*8.75 U*	*8.80 U*	*10.1 U*	*6.95 U*	*10.8 U*	3	6,100
1,1,2-Trichloroethane	*4.82 U*	*5.65 U*	*9.15 U*	*7.00 U*	*7.00 U*	*8.10 U*	*5.55 U*	*8.65 U*	1.4	1,600
1,1-Dichloroethane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	92	46,000
1,1-Dichloroethene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	1,200	330,000
1,1-Dichloropropene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	--	--
1,2,3-Trichlorobenzene	*24.1 U*	*28.3 U*	*45.6 U*	*35.1 U*	*35.1 U*	*40.5 U*	*27.7 U*	*43.3 U*	150	81,000
1,2,3-Trichloropropane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	0.0031	66
1,2,4-Trichlorobenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	82	45,000
1,2,4-Trimethylbenzene	**131**	*28.3 U*	*45.6 U*	**215**	*35.1 U*	*40.5 U*	28.0 J	*43.3 U*	160	43,000
1,2-Dibromo-3-chloropropane	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	--	--
1,2-Dibromoethane	*4.82 U*	*5.65 U*	*9.15 U*	*7.00 U*	*7.00 U*	*8.10 U*	*5.55 U*	*8.65 U*	0.24	420
1,2-Dichlorobenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	2,400	78,000
1,2-Dichloroethane	*4.82 U*	*5.65 U*	*9.15 U*	*7.00 U*	*7.00 U*	*8.10 U*	*5.55 U*	*8.65 U*	5.5	5,500
1,2-Dichloropropane	*4.82 U*	*5.65 U*	*9.15 U*	*7.00 U*	*7.00 U*	*8.10 U*	*5.55 U*	*8.65 U*	16	11,000
1,3,5-Trimethylbenzene	**224**	*14.1 U*	*22.9 U*	**360**	*17.6 U*	*20.2 U*	25.8 J	*21.6 U*	1,300	37,000
1,3-Dichlorobenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	2,300	62,000
1,3-Dichloropropane	*4.82 U*	*5.65 U*	*9.15 U*	*7.00 U*	*7.00 U*	*8.10 U*	*5.55 U*	*8.65 U*	--	--
1,4-Dichlorobenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	37	21,000
2,2-Dichloropropane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	--	--
2-Butanone (MEK)	*121 U*	*141 U*	*229 U*	*176 U*	*176 U*	*202 U*	*139 U*	*216 U*	15,000	23,000,000
2-Chlorotoluene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	--	--
2-Hexanone	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	110	270,000
4-Chlorotoluene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	--	--
4-Isopropyltoluene	**44.1**	*14.1 U*	*22.9 U*	**65.6**	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	--	--
4-Methyl-2-pentanone (MIBK)	*121 U*	*141 U*	*229 U*	*176 U*	*176 U*	*202 U*	*139 U*	*216 U*	18,000	2,200,000
Benzene	*6.00 U*	*7.05 U*	*11.4 U*	*8.75 U*	*8.80 U*	*10.1 U*	*6.95 U*	*10.8 U*	22	11,000
Bromobenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	360	160,000
Bromochloromethane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	--	--
Bromodichloromethane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	4.3	3,600
Bromoform	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	100	240,000
Bromomethane	*96.5 U*	*113 U*	*183 U*	*141 U*	*141 U*	*162 U*	*111 U*	*173 U*	24	10,000
Carbon disulfide	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	2,900	500,000
Carbon tetrachloride	*6.00 U*	*7.05 U*	*11.4 U*	*8.75 U*	*8.80 U*	*10.1 U*	*6.95 U*	*10.8 U*	21	9,100
Chlorobenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	460	180,000
Chloroethane	*96.5 U*	*113 U*	*183 U*	*141 U*	*141 U*	*162 U*	*111 U*	*173 U*	72,000	1,400
Chloroform	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	7.1	4,000
Chloromethane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	610	170,000
Dibromochloromethane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	2.7	110,000
Dibromomethane	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	25	31,000
Dichlorodifluoromethane	*24.1 U*	*28.3 U*	*45.6 U*	*35.1 U*	*35.1 U*	*40.5 U*	*27.7 U*	*43.3 U*	3,900	150,000
Ethylbenzene	**23.1 J**	*14.1 U*	*22.9 U*	**48.4**	*17.6 U*	*20.2 U*	24.7 J	*21.6 U*	130	49,000
Freon-113	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	--	--
Hexachlorobutadiene	*9.65 U*	*11.3 U*	*18.3 U*	*14.1 U*	*14.1 U*	*16.2 U*	*11.1 U*	*17.3 U*	20	3,300
Isopropylbenzene (Cumene)	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	5,600	54,000
Methyl-t-butyl ether	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	400	670,000
Methylene chloride	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	330	460,000
Naphthalene	**239**	*14.1 U*	*22.9 U*	**338**	*17.6 U*	*20.2 U*	**47.7**	*21.6 U*	38	29,000
P & M -Xylene	47.7 J	*28.3 U*	*45.6 U*	**107**	*35.1 U*	*40.5 U*	28.0 J	*43.3 U*	See Total Xylenes	See Total Xylenes
Styrene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	**159**	*21.6 U*	10,000	180,000
Tetrachloroethene	5.54 J	*7.05 U*	*11.4 U*	15.8 J	*8.80 U*	*10.1 U*	**74.6**	*10.8 U*	190	68,000
Toluene	19.0 J	*14.1 U*	*22.9 U*	**53.7**	*17.6 U*	*20.2 U*	17.7 J	*21.6 U*	6,700	200,000
Trichloroethene	4.82 J	**26.0**	*9.15 U*	8.77 J	*7.00 U*	*8.10 U*	**16.9**	*8.65 U*	11	4,900
Trichlorofluoromethane	*24.1 U*	*28.3 U*	*45.6 U*	*35.1 U*	*35.1 U*	*40.5 U*	*27.7 U*	*43.3 U*	41,000	980,000
Vinyl acetate	*48.1 U*	*56.5 U*	*91.5 U*	*70.0 U*	*70.0 U*	*81.0 U*	*55.5 U*	*86.5 U*	1,100	1,400,000
Vinyl chloride	*4.82 U*	*5.65 U*	*9.15 U*	*7.00 U*	*7.00 U*	*8.10 U*	*5.55 U*	*8.65 U*	0.8	650
Xylenes (total)	47.7 J	*42.4 U*	*68.5 U*	**107**	*52.5 U*	*60.5 U*	45.2 J	*65.0 U*	1,500	57,000
cis-1,2-Dichloroethene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	120	200,000
cis-1,3-Dichloropropene	*6.00 U*	*7.05 U*	*11.4 U*	*8.75 U*	*8.80 U*	*10.1 U*	*6.95 U*	*10.8 U*	18	21,000
n-Butylbenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	23,000	20,000
n-Propylbenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	9,100	52,000
o-Xylene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*17.2 J*	*21.6 U*	See Total Xylenes	See Total Xylenes
sec-Butylbenzene	**35.9**	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	42,000	28,000
tert-Butylbenzene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	11,000	35,000
trans-1,2-Dichloroethene	*12.1 U*	*14.1 U*	*22.9 U*	*17.6 U*	*17.6 U*	*20.2 U*	*13.9 U*	*21.6 U*	1,300	960,000
trans-1,3-Dichloropropene	*6.00 U*	*7.05 U*	*11.4 U*	*8.75 U*	*8.80 U*	*10.1 U*	*6.95 U*	*10.8 U*	18	21,000

NOTES:

1) Volatile organic compounds (VOC) analyses by Method EPA SW8260B
2) "ug/Kg" means "micrograms per kilogram"
3) **Bold** font indicates the analyte was detected above the laboratory Detection Limit (DL)
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the method Detection Limit (DL); the value presented is the Limit of Detection (LOD)
5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the Limit of Quantation (LOQ)
6) Yellow highlighting indicates the analyte was detected above the ADEC Method 2 - Migration to Groundwater Soil Cleanup Level
7) Organge highlighting indicates the analyte was detected about the ADEC Method 2 - Soil Cleanup Level for Human Health
8) Blue highlighting indicates the method detection limit was greater than the ADEC Method 2 Migration to Groundwater Soil Cleanup Level

TABLE 4
Polycyclic Aromatic Hydrocarbon Concentrations in Soil
RAVN Air Site Assessment
Report Date March 2018

POLYCYCLIC AROMATIC HYDROCARBON CONCENTRATIONS IN SOIL					
SAMPLE ID	RSE-1-4	RSE-2-1	RSE-X	**ADEC Method 2 Soil Cleanup Level For Migration to Groundwater**	**ADEC Method 2 Soil Cleanup Level - Under 40-inch Zone - Human Health**
Date	5/31/2017	5/31/2017	5/31/2017		
SGS WORK ORDER	1172844	1172844	1172844		
Units	ug/Kg	ug/Kg	ug/Kg	**(ug/Kg)**	**(ug/Kg)**
1-Methylnaphthalene	**973**	**485**	**1360**	410	68,000
2-Methylnaphthalene	**726**	**351**	**982**	1,300	310,000
Acenaphthene	195 J	97.7 J	197 J	37,000	4,600,000
Acenaphthylene	*132 U*	*52.5 U*	*133 U*	18,000	2,300,000
Anthracene	214 J	**164**	254 J	390,000	23,000,000
Benzo(a)Anthracene	**708**	**625**	**940**	280	2,000
Benzo[a]pyrene	**1380**	**1120**	**1680**	270	200
Benzo[b]Fluoranthene	**1680**	**1370**	**2000**	2,700	2,000
Benzo[g,h,i]perylene	**854**	**704**	**931**	15,000,000	2,300,000
Benzo[k]fluoranthene	**559**	**491**	**673**	27,000	20,000
Chrysene	**1340**	**1160**	**1730**	82,000	200,000
Dibenzo[a,h]anthracene	226 J	**185**	**283**	870	200
Fluoranthene	**1340**	**1200**	**1890**	590,000	3,100,000
Fluorene	106 J	62.1 J	125 J	36,000	3,100,000
Indeno[1,2,3-c,d] pyrene	**740**	**619**	**826**	8,800	2,000
Naphthalene	**275**	**140**	**377**	38	29,000
Phenanthrene	**779**	**552**	**888**	39,000	2,300,000
Pyrene	**1610**	**1410**	**2180**	87,000	2,300,000

NOTES:

1) Polycyclic aromatic hydrocarbons analyzed by SW 8270.
2) "mg/Kg" means "milligrams per kilogram"; "ug/Kg" means "micrograms per kilogram"
3) **Bold** font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD
5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ
6) Yellow highlighting indicates the result exceeds ADEC Migration to Groundwater standards
7) Organge highlighting indicates the analyte was detected about the ADEC Method 2 - Soil Cleanup Level for Human Health

Table 5
Groundwater Quality Field Parameters
RAVN Air Site Assessment
Report Date March 2018

GROUNDWATER QUALITY FIELD PARAMETERS											
LOCATION	**DATE**	**DEPTH TO WATER (feet)**	**DEPTH TO BOTTOM (feet)**	**DEPTH TO WATER POST-PURGING (feet)**	**VOLUME PURGED (gal)**	**TOTAL WATER REMOVED (gal)**	**TEMPERATURE (°C)**	**pH (pH Units)**	**CONDUCTIVITY (mS/cm)**	**SPECIFIC CONDUCTANCE (mS/cm)**	**SALINITY (ppt)**
RSE-1											
RSE-1	5/31/2017	51.64	60.50	59.09	3	1	3.73	5.29	0.139	0.082	0.07
						2	3.66	5.34	0.125	0.074	0.06
						3	3.63	5.56	0.119	0.071	0.06
RSE-2											
RSE-2	5/31/2017	52.21	60.47	59.10	2.5	1	4.49	5.31	0.133	0.087	0.06
						2	4.31	5.42	0.122	0.073	0.06
						2.5	4.23	5.48	0.124	0.075	0.06
RSE-3											
RSE-3	5/31/2017	53.84	54.62	54.01	3	1	4.53	6.07	0.337	0.205	0.06
						2	4.51	6.25	0.338	0.206	0.06
						3	4.53	6.3	0.330	0.207	0.06

NOTES:
1) Water quality measurements performed using a YSI Model 63 Water Quality Meter.
2) Purging of well was done with a submersible pump.
3) mS/cm = microsiemens per centimeter; ppt = parts per thousand.
4) Purging of well RSE-3 was interrupted; data shown is from re-purging the well after several hours of redevelopmment.

TABLE 6
Hydorcarbons in Groundwater
RAVN Air Site Assessment
Report Date March 2018

HYDROCARBONS IN GROUNDWATER									
SAMPLE ID	**DATE**	**DEPTH TO WATER (FEET)**	**DIESEL RANGE ORGANICS (mg/L)**	**GASOLINE RANGE ORGANICS**	**BENZENE (ug/L)**	**TOLUENE (ug/L)**	**ETHYL-BENZENE (ug/L)**	**XYLENES (ug/L)**	**SGS PROJECT NO.**
RSE-1	5/31/2017	51.64	**0.193 J**	*0.0500 U*	*0.200 U*	*0.500 U*	*0.500 U*	*1.50 U*	11772844
RSE-2	5/31/2017	52.21	*0.318 U*	*0.0500 U*	*0.200 U*	*0.500 U*	*0.500 U*	*1.50 U*	
RSE-3	5/31/2017	53.84	*0.294 U*	*0.0500 U*	*0.200 U*	*0.500 U*	*0.500 U*	*1.50 U*	
RSE-X	5/31/2017	--	*0.305 U*	*0.0500 U*	*0.200 U*	*0.500 U*	*0.500 U*	*1.50 U*	
ADEC GROUNDWATER CLEANUP LEVELS TABLE C (18 AAC 75)			**1.5**	**2.2**	**4.6**	**1100**	**15**	**190**	

NOTES:

1) GRO samples analyzed by AK Method 101; DRO samples analyzed by AK Method 102; RRO samples analyzed by AK Method 103; BTEX samples by EPA 8021
2) "mg/L" means "milligrams per liter"; "ug/L" means "micrograms per liter"
3) **Bold** font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)
4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD
5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ
6) Groundwater sample RSE-X is a blind duplicate of RSE-1
7) Light yellow highlighting indicates the sample analyte was detected above applicable ADEC cleanup standards

TABLE 7
Volatile Organic Compounds in Groundwater
RAVN Air Site Assessment
Report Date March 2018

VOLATILE ORGANIC COMPOUND CONCENTRATIONS IN GROUNDWATER					
SAMPLE ID	RSE-1	RSE-2	RSE-3	RSE-X	**ADEC Table C**
Date	5/31/2017	5/31/2017	5/31/2017	5/31/2017	**Groundwater Cleanup**
SGS Work Order	11772844	11772844	11772844	11772844	**Levels**
Units	(µg/L)	(µg/L)	(µg/L)	(µg/L)	**(µg/L)**
1,1,1,2-Tetrachloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	5.7
1,1,1-Trichloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8,000
1,1,2,2-Tetrachloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	0.76
1,1,2-Trichloroethane	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	0.41
1,1-Dichloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	28
1,1-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	280
1,1-Dichloropropene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
1,2,3-Trichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	7
1,2,3-Trichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	0.0075
1,2,4-Trichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4
1,2,4-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	15
1,2-Dibromo-3-chloropropane	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	
1,2-Dibromoethane	*0.0375 U*	*0.0375 U*	*0.0375 U*	*0.0375 U*	0.075
1,2-Dichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	300
1,2-Dichloroethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	1.7
1,2-Dichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.4
1,3,5-Trimethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	120
1,3-Dichlorobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	300
1,3-Dichloropropane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.7
1,4-Dichlorobenzene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.8
2,2-Dichloropropane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
2-Butanone (MEK)	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	5,600
2-Chlorotoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
2-Hexanone	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	38
4-Chlorotoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
4-Isopropyltoluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
4-Methyl-2-pentanone (MIBK)	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	6,300
Benzene	*0.200 U*	*0.200 U*	*0.200 U*	*0.200 U*	4.6
Bromobenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	62
Bromochloromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
Bromodichloromethane	**0.319 J**	**0.341 J**	**0.307 J**	**0.334 J**	1.3
Bromoform	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	33
Bromomethane	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	7.5
Carbon disulfide	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	810
Carbon tetrachloride	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.6
Chlorobenzene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	78
Chloroethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	
Chloroform	**0.664 J**	**0.870 J**	**0.600 J**	**0.711 J**	2.2
Chloromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	190
Dibromochloromethane	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	8.7
Dibromomethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	8.3
Dichlorodifluoromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	200
Ethylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	15
Freon-113	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	
Hexachlorobutadiene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.4
Isopropylbenzene (Cumene)	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	450
Methyl-t-butyl ether	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	140
Methylene chloride	*2.50 U*	*2.50 U*	*2.50 U*	*2.50 U*	110
Naphthalene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1.7
P & M -Xylene	*1.00 U*	*1.00 U*	*1.00 U*	*1.00 U*	See Total Xylenes
Styrene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,200
Tetrachloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	41
Toluene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,100
Trichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	2.8
Trichlorofluoromethane	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	5,200
Vinyl acetate	*5.00 U*	*5.00 U*	*5.00 U*	*5.00 U*	410
Vinyl chloride	*0.0750 U*	*0.0750 U*	*0.0750 U*	*0.0750 U*	0.19
Xylenes (total)	*1.50 U*	*1.50 U*	*1.50 U*	*1.50 U*	190
cis-1,2-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	280
cis-1,3-Dichloropropene	*0.250 U*	*0.250 U*	*0.250 U*	*0.250 U*	4.7
n-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	1,000
n-Propylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	660
o-Xylene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	See Total Xylenes
sec-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	2,000
tert-Butylbenzene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	690
trans-1,2-Dichloroethene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	360
trans-1,3-Dichloropropene	*0.500 U*	*0.500 U*	*0.500 U*	*0.500 U*	4.7

NOTES:

1) Volatile organic compounds (VOC) analyses by Method EPA SW8260B

2) "ug/Kg" means "micrograms per kilogram"

3) **Bold** font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)

4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD); the value presented is the LOD

5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ

6) Yellow highlighting indicates the analyte was detected above the ADEC Method 2 - Soil Cleanup Level

7) Blue highlighting indicates the method detection limit was greater than the ADEC Method-2 Soil Cleanup Level

TABLE 8
Polycyclic Aromatic Hydrocarbons in Groundwater
RAVN Air Site Assessment
Report Date March 2018

POLYNUCLEAR AROMATIC HYDROCARBONS IN GROUNDWATER					
SAMPLE ID	**RSE-1**	**RSE-2**	**RSE-3**	**RSE-X**	**ADEC TABLE C GROUNDWATER ACTION LEVELS**
DATE	05/31/17	5/31/2017	5/31/2017	5/31/2017	
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L
1-Methylnaphthalene	**0.306**	**0.243**	*0.0252 U*	**0.174**	11
2-Methylnaphthalene	**0.411**	**0.387**	*0.0252 U*	**0.258**	36
Acenaphthene	**0.0250 J**	**0.0176 J**	*0.0252 U*	*0.0232 U*	530
Acenaphthylene	*0.0256 U*	*0.0259 U*	*0.0252 U*	*0.0232 U*	260
Anthracene	*0.0256 U*	*0.0259 U*	*0.0252 U*	*0.0232 U*	43
Benzo(a)Anthracene	**0.0229 J**	**0.0166 J**	*0.0252 U*	**0.0139 J**	0.12
Benzo[a]pyrene	**0.0132 J**	**0.0109 J**	*0.0101 U*	**0.00804 J**	0.34
Benzo[b]Fluoranthene	**0.0398 J**	**0.0274 J**	*0.0252 U*	**0.0245 J**	0.34
Benzo[g,h,i]perylene	**0.0207 J**	**0.0178 J**	*0.0252 U*	**0.0140 J**	0.26
Benzo[k]fluoranthene	*0.0256 U*	*0.0259 U*	*0.0252 U*	*0.0232 U*	0.8
Chrysene	**0.0809**	**0.0613**	*0.0252 U*	**0.0482**	2
Dibenzo[a,h]anthracene	*0.0103 U*	*0.0104 U*	*0.0101 U*	*0.00925 U*	0.034
Fluoranthene	**0.0597**	**0.0452 J**	*0.0252 U*	**0.0344 J**	260
Fluorene	**0.118**	**0.109**	*0.0252 U*	**0.0781**	4.3
Indeno[1,2,3-c,d] pyrene	*0.0256 U*	*0.0259 U*	*0.0252 U*	*0.0232 U*	0.19
Naphthalene	**0.137**	**0.112**	*0.0505 U*	**0.0835 J**	1.7
Phenanthrene	**0.315**	**0.305**	**0.0163 J**	**0.224**	170
Pyrene	**0.0611**	**0.0471 J**	*0.0252 U*	**0.0392 J**	120

NOTES:

1) PAH analyses by Method EPA 8270D

2) Light yellow highlighting indicates analyte measured above ADEC Method 2 soil cleanup levels for migration to groundwate

3) Bold font indicates the analyte was detected above the laboratory Limit of Quantitation (LOQ)

4) *Italicized* font with a U-qualifier indicates the analyte was not detected above the limit of detection (LOD);
the value presented is the LOD

5) J flag indicates the result is an estimated value above the Detection Limit (DL) but less than the LOQ

Attachment C: Select Site Photographs

Mobilizing drill rig to RSE-3.

Transition zone from silty sand to sandy silt at RSE-3.

Example of drive interval containing dense sandy silt and clay.

Installation of temporary monitoring well at RSE-2.

Temporary monitoring well at RSE-3.

Setting up water sampling equipment at RSE-2.

Drill rig setting up at RSE-1, facing east.

Example core of sandy silt with clay from RSE-1.

Mobilizing water sampling equipment to RSE-1.

RSE-1 recessed temporary monitoring well.

Decommissioned well casings staged near RSE-3.

Decommissioning RSE-1 following sampling.

Attachment D: Boring Logs

RESTORATION
Science & Engineering, LLC

RESTORATION
Science & Engineering, LLC
911 W 8TH AVE, SUITE 100
ANCHORAGE, ALASKA 99501
PH. (907) 278-1023
FAX. (907) 277-5718

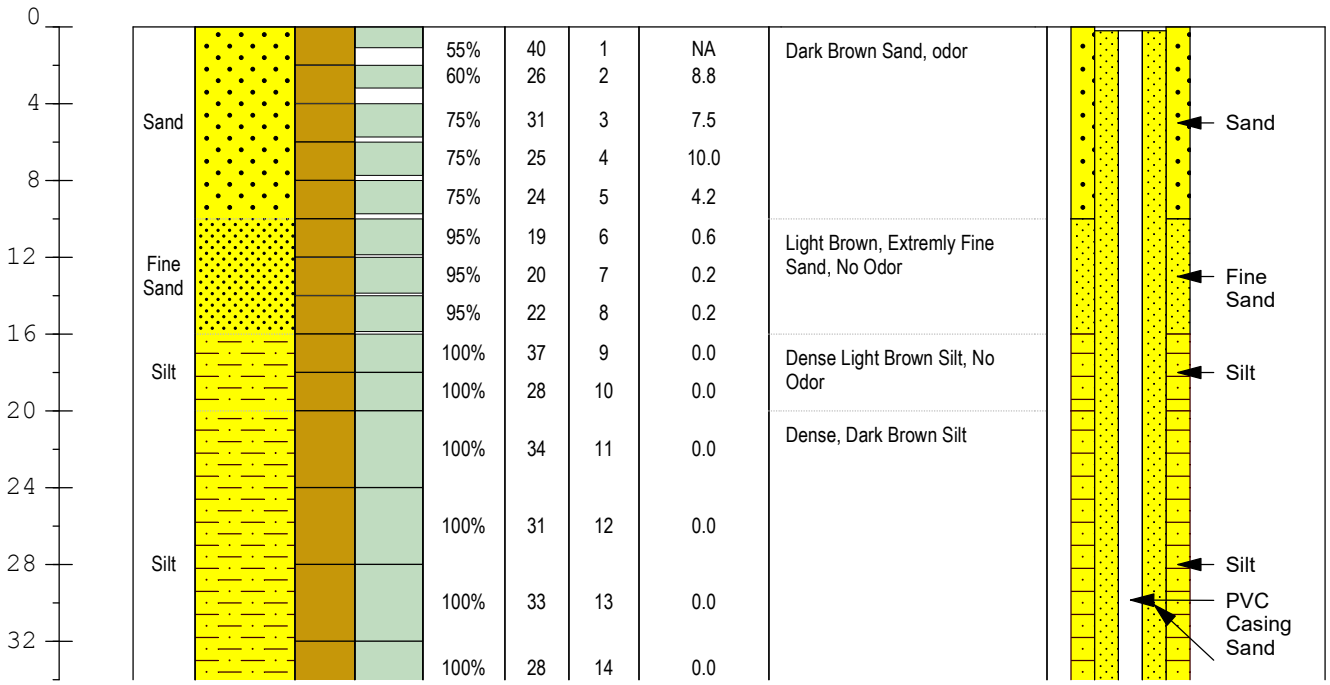
GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-1
Weather: Sunny, ~70° f, No Wind
Total Depth: 60.5

Project: RAVN Air Anc Site Assessment
Site Location: 4700 Old International Road
Job Number: 16-1636
Project Manager: D. Nyman
Logged By: A. Forbes
Dates Drilled: 5.31.2017

Drilling Company: Discovery Drilling
Drill Operator: N/A
Drill Rig Type: Truck Mounted CME 75
Method of Drilling: 4" Hollow Stem Auger
Sampling Method: 2' Split Spoon
Hammer Weight / Drop: 340 lbs

Legend
WL Water level during drilling



NOTES: Boring Completed as temporary monitoring well USCS by visual-manual methods

RESTORATION
Science & Engineering, LLC
911 W 8TH AVE, SUITE 100
ANCHORAGE, ALASKA 99501
PH. (907) 278-1023
FAX. (907) 277-5718

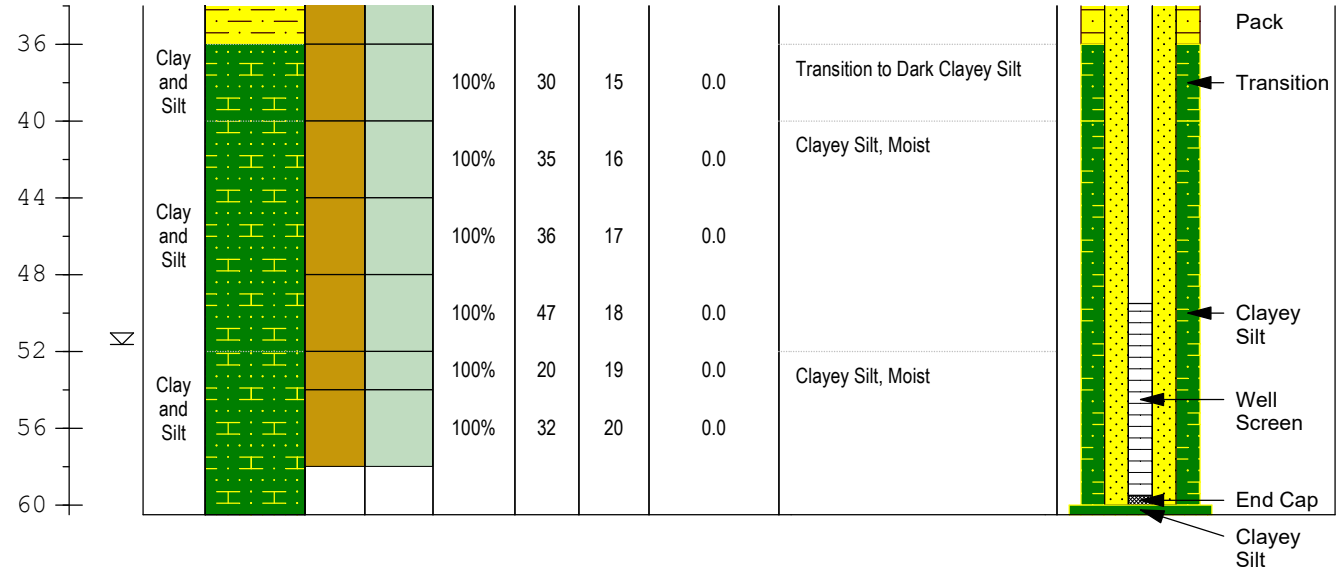
GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-1
Weather: Sunny, ~70° f, No Wind
Total Depth: 60.5

Project: RAVN Air Anc Site Assessment
Site Location: 4700 Old International Road
Job Number: 16-1636
Project Manager: D. Nyman
Logged By: A. Forbes
Dates Drilled: 5.31.2017

Drilling Company: Discovery Drilling
Drill Operator: N/A
Drill Rig Type: Truck Mounted CME 75
Method of Drilling: 4" Hollow Stem Auger
Sampling Method: 2' Split Spoon
Hammer Weight / Drop: 340 lbs

Legend
▽ Water level during drilling



NOTES: Boring Completed as temporary monitoring well USCS by visual-manual methods

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FAX. (907) 277-5718

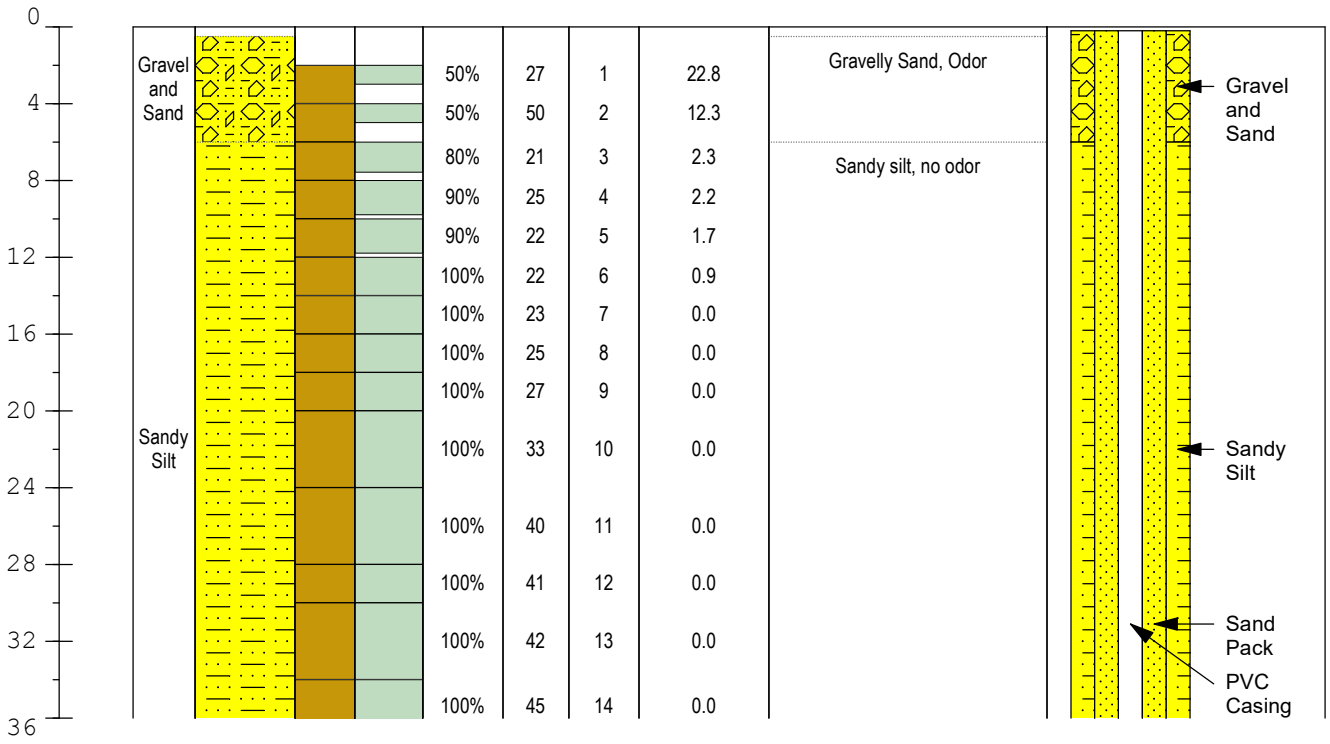
GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-2
Weather: Sunny, ~70° f, No Wind
Total Depth: 62

Project: RAVN Air Anc Site Assessment
Site Location: 4700 Old International Road
Job Number: 16-1636
Project Manager: D. Nyman
Logged By: A. Forbes
Dates Drilled: 5.31.2017

Drilling Company: Discovery Drilling
Drill Operator: N/A
Drill Rig Type: Truck Mounted CME 75
Method of Drilling: 4" Hollow Stem Auger
Sampling Method: 2' & 4' Split Spoon
Hammer Weight / Drop: 340 lbs

Legend
▽ Water level during drilling



NOTES: Boring Completed as temporary monitoring well USCS by visual-manual methods

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PH. (907) 278-1023
FAX. (907) 277-5718

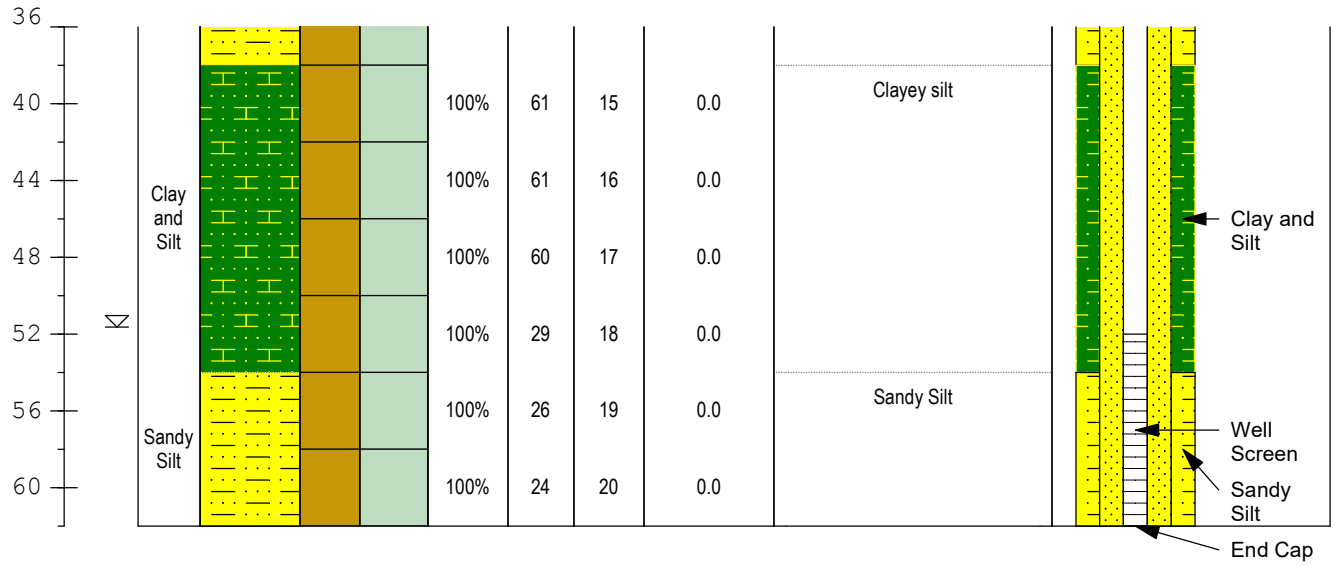
GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-2
Weather: Sunny, ~70° f, No Wind
Total Depth: 62

Project: RAVN Air Anc Site Assessment
Site Location: 4700 Old International Road
Job Number: 16-1636
Project Manager: D. Nyman
Logged By: A. Forbes
Dates Drilled: 5.31.2017

Drilling Company: Discovery Drilling
Drill Operator: N/A
Drill Rig Type: Truck Mounted CME 75
Method of Drilling: 4" Hollow Stem Auger
Sampling Method: 2' & 4' Split Spoon
Hammer Weight / Drop: 340 lbs

Legend
▽ Water level during drilling



NOTES: Boring Completed as temporary monitoring well USCS by visual-manual methods

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Science & Engineering, LLC
911 W 8TH AVE, SUITE 100
ANCHORAGE, ALASKA 99501
PH. (907) 278-1023
FAX. (907) 277-5718

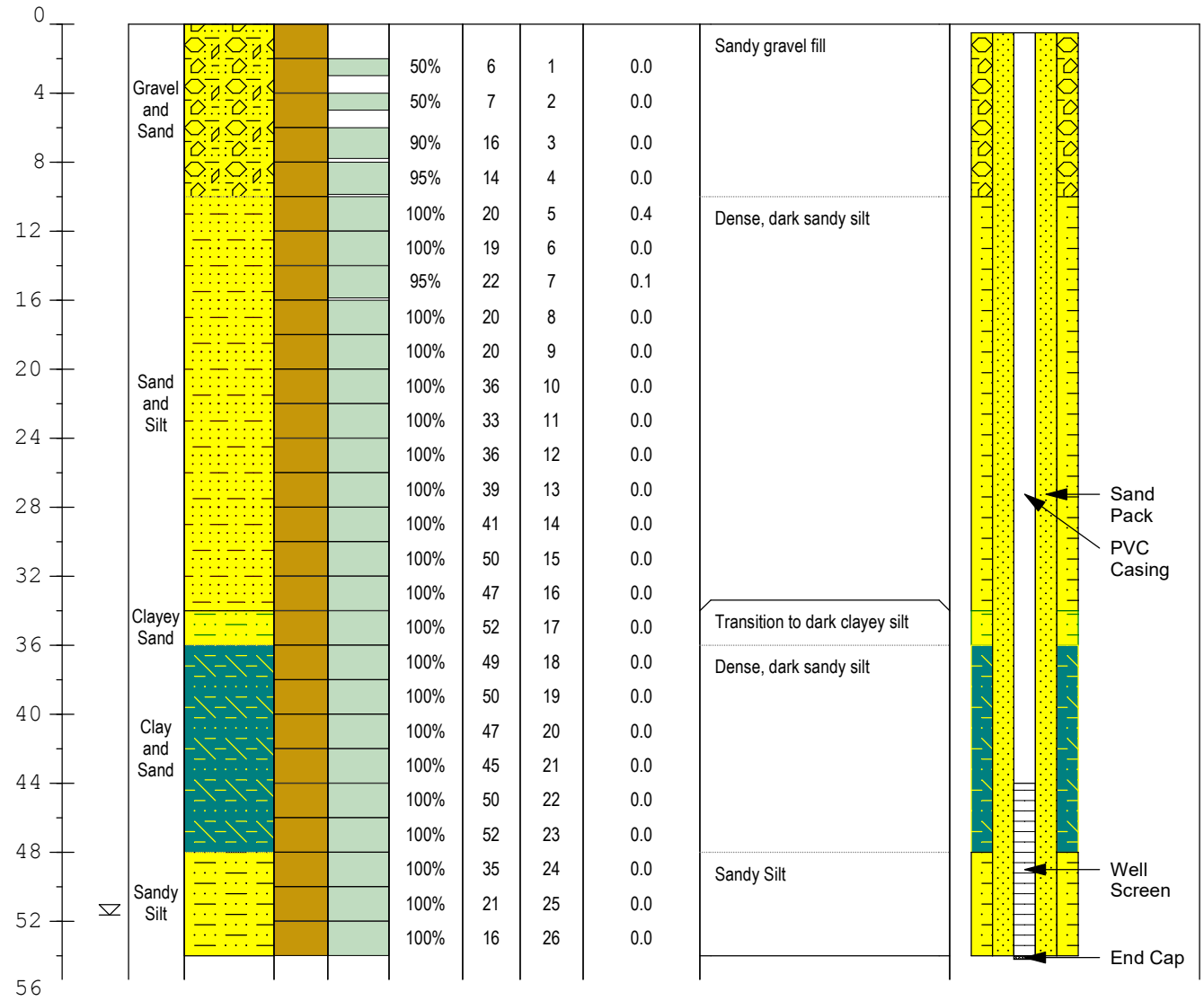
GEOENVIRONMENTAL BOREHOLE LOG

Soil Boring ID: RSE-3
Weather: Sunny, ~70° f, No Wind
Total Depth: 54

Project: RAVN Air Anc Site Assessment
Site Location: 4700 Old International Road
Job Number: 16-1636
Project Manager: D. Nyman
Logged By: A. Forbes
Dates Drilled: 5.31.2017

Drilling Company: Discovery Drilling
Drill Operator: N/A
Drill Rig Type: Truck Mounted CME 75
Method of Drilling: 4" Hollow Stem Auger
Sampling Method: 2' Split Spoon
Hammer Weight / Drop: 340 lbs

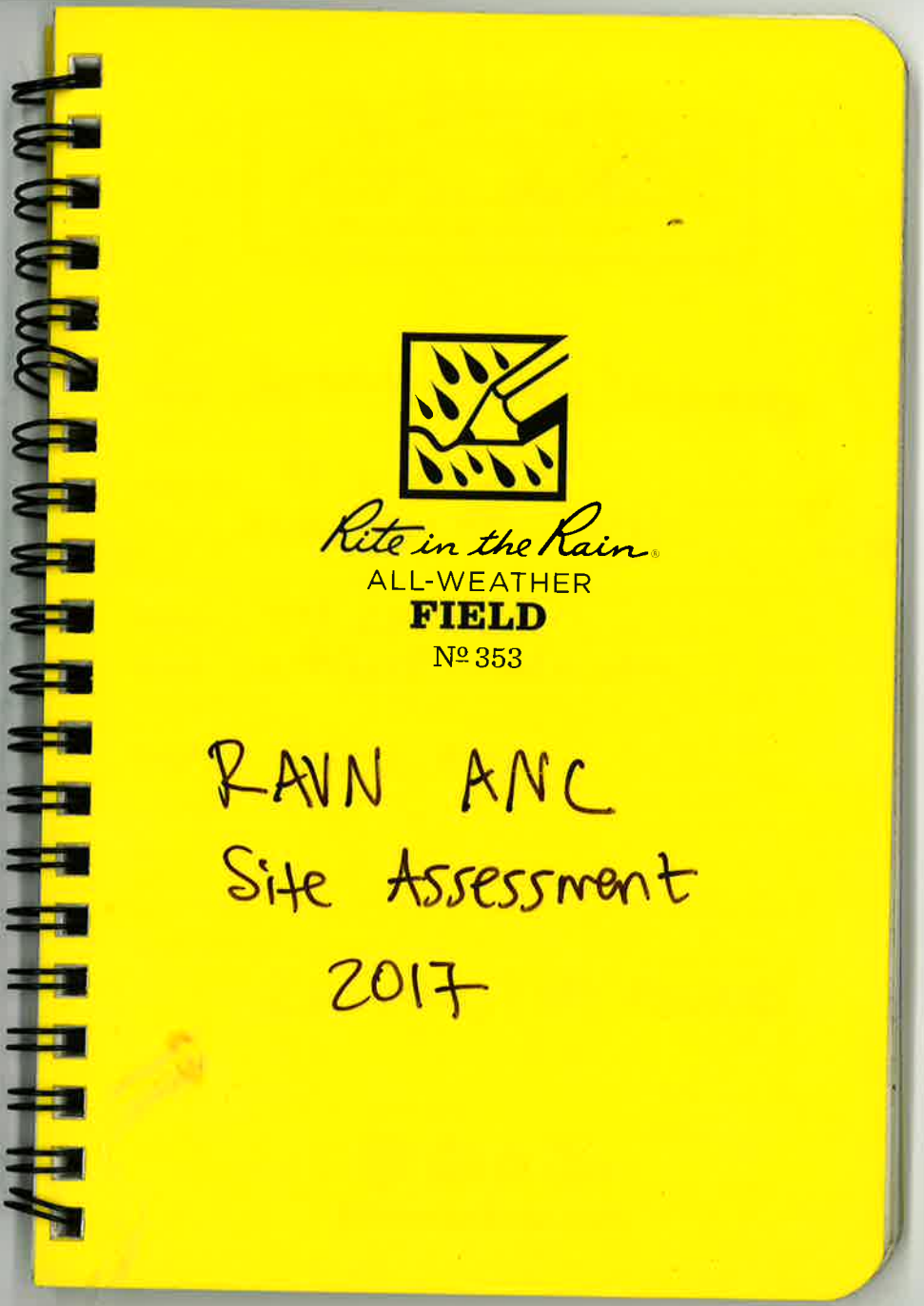
Legend
▽ Water level during drilling

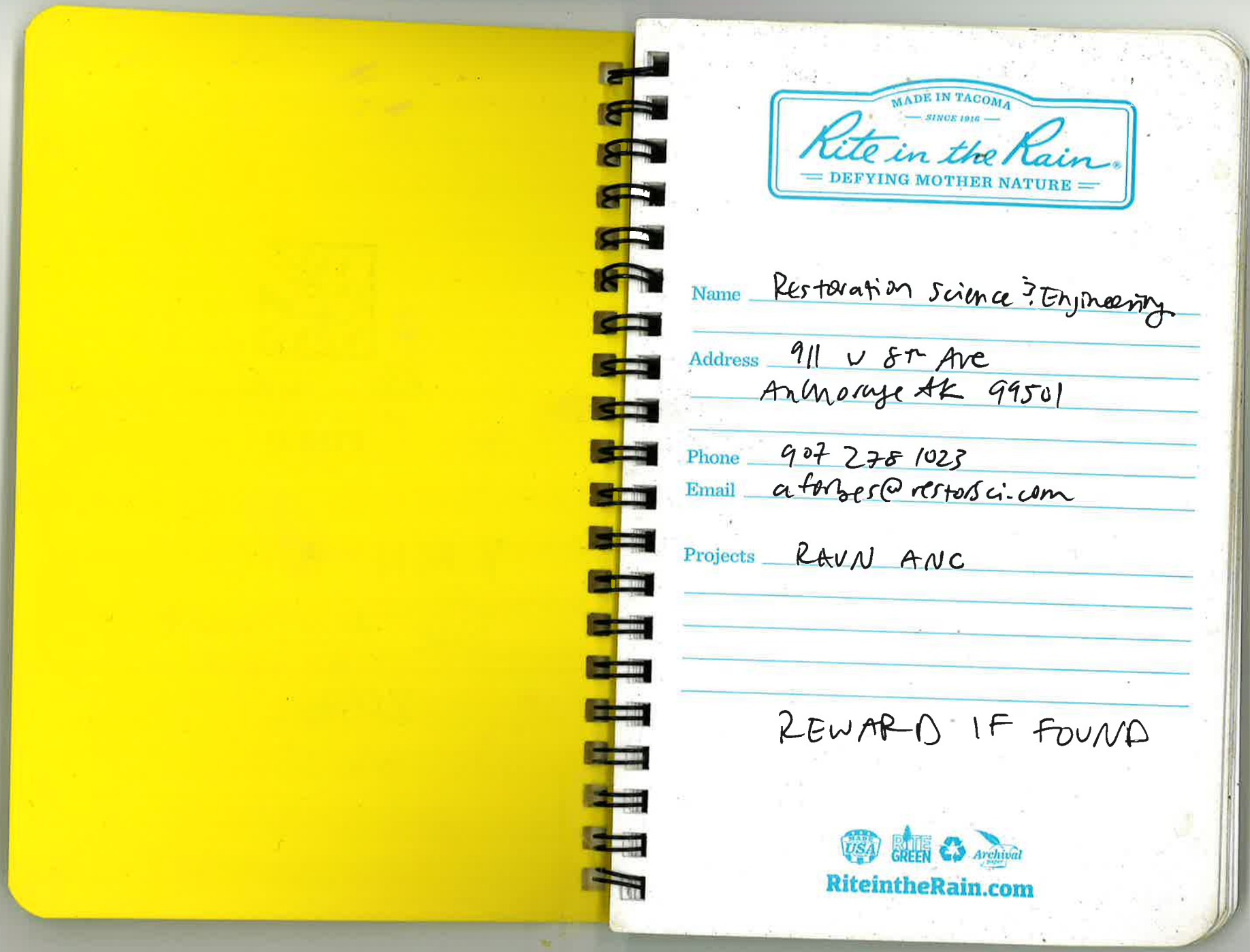


NOTES: Boring Completed as temporary monitoring well USCS by visual-manual methods

Attachment E: Copy of Field Notes

RESTORATION Science & Engineering, LLC


Rite in the Rain
ALL-WEATHER
FIELD
№ 353
RAVN ANC
Site Assessment
2017


MADE IN TACOMA
SINCE 1916
Rite in the Rain
DEFYING MOTHER NATURE
Name Restoration Science & Engineering
Address 911 W 8th Ave
Anchorage AK 99501
Phone 907 278 1023
Email aforbes@restorsci.com
Projects RAVN ANC
REWARD IF FOUND
RiteintheRain.com

CONTENTS

PAGE	REFERENCE	DATE

RAVN
5/31/17

May 31
Sunny ~50°F
wind 0-5 mph
Arran Foxsei RSE

0800 onsite AF, Rex (Ravn) escort, Scott + Daniel Discovery Drilling

0815 safety moment. Kill switch, aircraft utilities by Ravn. Site clear. AF mark sample locs per work plan. Wait to conduct drilling on other side of fence. Swing ties with trailer and AST system and hangar.

Discovery setting up tooling at RSE-3 ACME 75 hollow stem. Continuous sampling at 2' intervals. Screening using PID 11.7 eV from TTT rental.
Skip 1st 2 ft bgs per work plan

Jerry French onsite observing.

RSE-3	Depth	P.I.D	BC	rec %	type
1	2-4	0.0	~~[illegible]~~ 3-3 (6)	50	sandy gravel fill
2	4-6	0.0	3-4(7)	50	"
3	6-8	0.0	18	90	muddy silt "transition
4	8-10	0.0	14	95	" some sandy fill
0910 5	10-12	0.4	20	100	silt first 4" rec sandy sand silt
6	12-14	0.0	19	100	silt
7	14-16	0.1	22	95	sandy silt moist
8	16-18	0.0	20	100	silt dry
9	18-20	0.0	20	100	silt dry
10	20-22	0.0	36	100	"
12	22-24	0.0	33	100	"
13	24-26	0.0	36	100	silt "
14	26-28	0.0	38	100	"
15	28-30	0.0	41	100	"
16	30-32	0.0	50	100	"
17	32-34	0.0	47	100	"
18	34-36	0.0	52	100	6" silt 1.5' bluish clayey silt
19	36-38	0.0	49	100	bluish clay
20	38-40	0.0	50	100 dry	"
21	40-42	0.0	47	100	"
22	42-44	0.0	45	100	"
23	44-46	0.0	50	100	"
24	46-48	0.0	52	100	"
25	48-50		35 w	100	wet sandy silt

#	DU	PID	BC	notes
26	50-52	0.0	21	"wet
1120 27	52-54	0.0 -	16	"wet

Set temp well at 54'. Discovery calling in addtl tooling for RSE 2 and RSE-1.

Submit samples ~~RSE-5~~ RSE-3-5 0910
~~RSE-2~~ RSE-3-27 1120
highest PID + soil/water interface

1115 E Mahanna on site. no need for 2 samplers at current pace.

1140 Begin RSE-2. Fuel odor on soil in first 2 ft of cuttings.
Three RAVN personnel onsite.
Mahanna dropped H_2O equipment and demobed

Site has near gradient to west/southwest.
Removable surface @ spill corrective actions
rest is paved (asphalt) including adjacent property. visible gradient away from adjacent property.

R 5/31/17 RAVN

RSE-2	BGS	PID	SC	notes	rec
1200 • 1	2-4	22.8	27	gravelly sand / odor	50
2	4-6	12.3	50	" rock	50
1230 • 3	6-8	2.3	21	sandy silt major	80
4	8-10	2.2	25	sandy silt → sand	90
5	10-12	1.7	~~22~~	sandy silt	90
6	12-14	0.9	22	silt	100
7	14-16	0.0	23	silt	100
8	16-18	0.0	25	silt	100
9	18-20	0.0	27	silt	100

Direct PD to 4ft drive intervals thru homogeneous clay/silt. ~~[illegible]~~ Less ~~[illegible]~~ data in this area, efficiency for RAVN. Phone call with D Nyman.

10	20-24	0.0	33	"	100
11	24-28	0.0	40	"	100
12	28-30	0.0	41	"	100
13	30-34	0.0	42	"	100
14	34-38	0.0	45	"	100
15	38-42	0.0	61	1/2 silt 1/2 sandy clay	100
~~16~~	~~[illegible]~~	~~0.0~~	~~[illegible]~~		
~~17~~	~~38-40~~		~~80~~		

incorrect depth intervals noted, disregard.

4

RAVN 5/31/17

RSE-1

Vol	temp	pH	sal	cond	(specific) spec cond
1	4.41	6.01	0.29	0.59	0.358
2	4.40	5.67	0.30	0.612	0.371
PAUSE					
*REDEVELOP IN PM					
3	4.53	6.07	0.08	0.237	0.205
4	4.51	6.25	0.0[illegible]	0.228	0.206
5	4.53	6.30	0.06	0.238	0.207

Light turbidity not decreased with purging. No sheen or odor observed

Sample @ 1740

Well Depth	54.62
Depth to water	53.84
Depth after purge	54.01

Well volume: @ 2" diameter .78"

Well is poor producer, recharge from surrounding wedoa

5

RAVN
5/31/17

RSE-2	BGS	PID	BC	notes
16	42-46	0.0	61 100	blue silt clay
17	46-50	0.0	60 100	"
18	50-54	0.0	29 100	" wet
19	54-58	0.0	26 100	clay → ~~[illegible]~~ sandy silt
225 20	58-62	0.0	24 100	sandy silt clay WATER

~~Set~~ temp (well) ~~[illegible]~~ at 62' (PEN!)

RSE-2 samples
RSE-2-1 1200 (PAH)
RSE-2-3 1230
RSE-2-20 1425

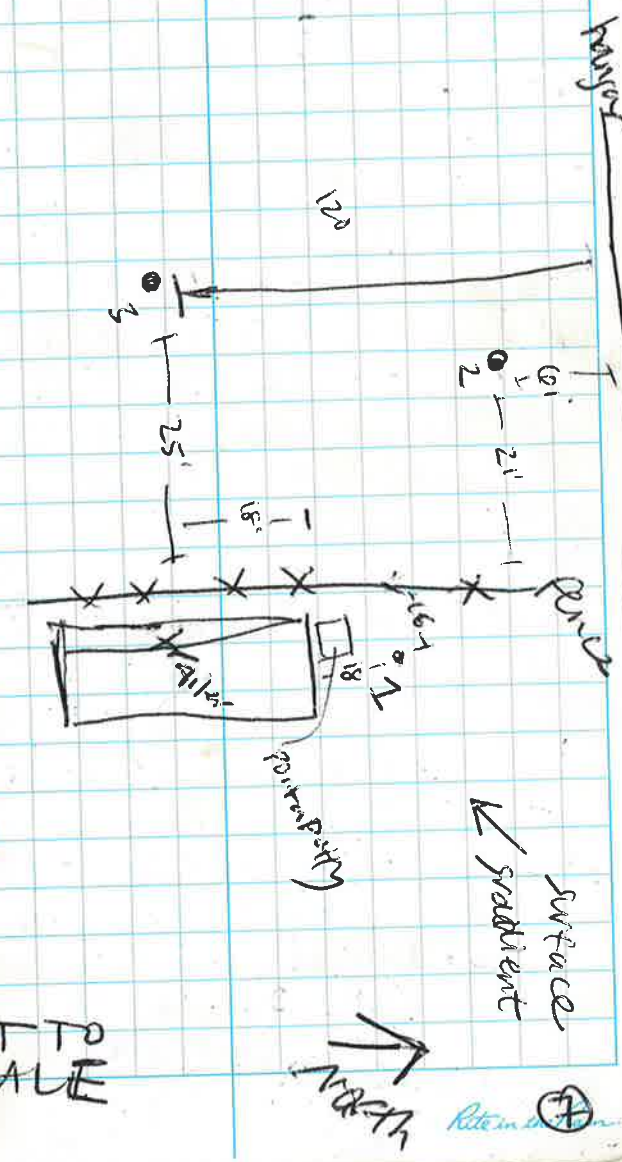
1520 Temp Well RSE-2 complete
RSE begin developing

Vol (gal)	temp	pH	sal	cond	spec cond
1	4.49	5.21	0.06	0.137	0.081
2	4.31	5.42	0.06	0.122	0.074
3 (2.5)	4.23	5.48	0.06	0.124	0.075

moderate turbidity, light brown, no sheen, no odor

Depth water 52.20 — volume in well
Depth Bottom 60.47 — 8.27' @ 2" diameter
Depth post purge 59.1 (↑ nine) — Sample @ 1645

RAVN 5/31/17



RAVN
5/31/17

1700 Begin RSE-1 while RSE complete sampling of RSE-3 (re developed from earlier in PM)

RSE-1	BGS	PID	BC	IREC	NOTES
NO SAMPLE 1	0-2	—	40	55	Asphalt → dark brown sand
2	2-4	8.8	26	60	dark brown sand odor no gravel
3	4-6	7.5	31	75	"
1715 • 4	6-8	10.0	25	75	"
5	8-10	4.2	24	75	"
1735 • 6	10-12	0.0	19	95	light brown sand ↓ extremely fine, silty
7	12-14	0.2	20	95	"
8	14-16	0.2	22	95	"
9	16-18	0.0	37	100	6" above ↑ 1.5' dense light brown silt
10	18-20	0.0	28	100	Silt

Call D Nyman. Discuss whether 4th boring is needed. Results (FS) of RSE-1 do not indicate obvious plume or source area beyond what is known historically. Agree that no addtl boring is needed and will stop at third (RSE-1)

Install drillers, to 4 foot intervals at silt layer w/ consistent fractures and FS readings.

(6)

RAVN 5/31/17

RSE-1	BGS	PID	BC	IREC	NOTES
11	20-24	0.0	24	100	dense dark brown silt
12	24 28	0.0	31	100	"
13	28 32	0.0	33	100	"
14	32 36	0.0	28	100	"
15	36 40	0.0	30	100	1' above ↑ 1' bluish clay, dense, some moisture
16	40 44	0.0	35	100	"
17	44 48	0.0	36	100	"
18	48 52	0.0	47	100	" wet

Bottom sample wet, likely adequate for a well but in interest of the end of the day direct 8 more feet for recharge and sufficient water for sample.

19	52 54	0.0	26	100	"
1855 • 20	54 58	0.0	32	100	" wet

RSE-1 Sample

RSE-1-4 1715 (PAH + Duplicate)

RSE-1-6 1735

RSE-1-20 1855

(9)

Rite in the Rain

RAVN
5/31/17

1440 start water sampling RSE-1 DD begin decommissioning RSE-2. Bentonite fill.

Depth to Bottom 60.50
Depth to Water 51.64
Depth postpurge 59.09

well volume 2" diameter 8.86 l

Wlvs	temp	PH	Sal	cond	Spec cond
1	3.73	5.29	0.07	0.137	0.082
2	3.66	5.34	0.06	0.125	0.074
3	3.63	5.56	0.06	0.119	0.071

no odor or sheen observed on water. some turbidity.

DD decomission RSE-3

Sample : 2020 with duplicate (RSE-X)

DD decommission RSE-1

Final walkthrough for Mississ creek cover on well burials for minimum stick up.

Cuttings + purge H2O left at site as Jenny, Terry French indicated would be picked up and put out of the way (onsite) tomorrow 6/1. 1= 46gls 2= 33gls 3= 45gls (55gal)

SOME OBSERVATIONS GENERALLY

RAVN
5/31/17

All 3 wells generally poor producers. Draw down surrounding take after purging. May should protect against disturbance from drilling + well installation in quick turnaround.

Fill was substantially different across fence line, with west part having little to no gravel and the west quite silt. Lithology became similar around 10-12 feet, with dense silt transitioning to clay.

Samples collected from highest PID, presumed vertical limit of impacts, and soil-water interface (though with clay to sand this was a sizable range)

Field screening indicated impacts in RSE-2 and RSE-1. RSE-3 appeared "clean" in the field. Odor from 2 and 1 were similar, hydrocarbon and sulfidish. Representative samples submitted Am. Isotk.

-water depth measurements taken from top of casing flush with ground surface. (RSE-1 casing recessed so measured from asphalt).

Rite in the Rain

RAVN
5/31/17

021:15 DEMOB FROM SITE
sample management @ Knik

Attachment F: QA QC Checklist

RESTORATION
Science & Engineering, LLC

Laboratory Data Review Checklist

Completed by: Arran Forbes

Title: Environmental Scientist Date: 9/20/17

CS Report Name: RAVN ANC Site Investigation Report Date: 6/16/17

Consultant Firm: Restoration Science & Engineering, LLC

Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1172844

ADEC File Number: 2100.38.558 ADEC RecKey Number:

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      SGS North America, Inc. located in Anchorage, Alaska.

   b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
      ☐Yes ☒ No ☐NA (Please explain.) Comments:

      No samples were transferred.

2. Chain of Custody (COC)
   a. COC information completed, signed, and dated (including released/received by)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      A copy of the signed COC is provided at the end of the end of the laboratory report, pages 136-137.

   b. Correct analyses requested?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      SGS completed the requested analyses requested on the COC.

3. Laboratory Sample Receipt Documentation
   a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

      The sample cooler temperature blank was 4.6C on delivery to the laboratory.

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

☒**Yes** ☐ No ☐ NA (Please explain.) Comments:

Volatile soil samples were preserved in methanol; volatile water samples were preserved in HCl.

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

☒Yes ☐ No ☐NA (Please explain.) Comments:

Review of the sample receipt form indicated the samples were received in good condition.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

☐Yes ☐ No ☒NA (Please explain.) Comments:

No discrepancies noted.

e. Data quality or usability affected? (Please explain.)

Comments:

Data quality and usability was not affected.

4. Case Narrative

a. Present and understandable?

☒Yes ☐ No ☐ NA (Please explain.) Comments:

The case narrative is present and understandable on page 2 of the lab report.

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

☒Yes ☐ No ☒NA (Please explain.) Comments:

Multiple surrogate recovery failures reported by lab for methods AK 101, EPA 8260, and EPA 8270.

c. Were all corrective actions documented?

☒ Yes ☐ No ☐NA (Please explain.) Comments:

Multiple samples were analyzed twice to confirm QC failures. No corrective actions were taken, and data is reported as-is with qualifiers.

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

Comments:

There is no effect on data quality and usability. For 4-bromofluorobenzene, criteria were not met due to matrix. For PAHs in water, surrogate terphenyl-d14 was affected due to matrix or sample dilution.

5. Samples Results
   a. Correct analyses performed/reported as requested on COC?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

Correct analyses were performed as requested.

   b. All applicable holding times met?
      ☒Yes ☐ No ☐ NA (Please explain.) Comments:

Holding times were met for all samples according to the lab method.

   c. All soils reported on a dry weight basis?
      ☒Yes ☐ No ☐NA (Please explain.) Comments:

Sample weights are reported on a dry weight basis on each page of the report describing the target sample. Groundwater is also submitted under the same COC.

   d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?
      ☒Yes ☐ No ☐ NA (Please explain.) Comments:

SGS refers to the PQL as the LOQ and reports data below the PQL but above the detection limit (DL) as estimated results with a "J". Constituents that were analyzed for but not detected are reported as a value equal to 2 times the DL and flagged with a "U".

   e. Data quality or usability affected?
      Comments:

There is no effect on data quality or usability.

6. QC Samples
   a. Method Blank
      i. One method blank reported per matrix, analysis and 20 samples?
      ☒Yes ☐ No ☐ NA (Please explain.) Comments:

There is one method blank for each requested analyses and matrix per 20 samples submitted.

      ii. All method blank results less than PQL?
      ☒Yes ☐ No ☐ NA (Please explain.) Comments:

All method blank results are less than the LOQ (PQL).

      iii. If above PQL, what samples are affected?
      Comments:

No method blank samples were reported above the LOQ (PQL).

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

No method blank samples were reported above the LOQ (PQL).

☐Yes ☐ No ☒NA (Please explain.) Comments:

v. Data quality or usability affected? (Please explain.)

Data quality or usability was not affected.

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

☒Yes ☐ No ☐ NA (Please explain.) Comments:

One LCS and LCSDs were performed per analysis (less than 20 samples submitted).

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

☐ Yes ☒ No ☐NA (Please explain.) Comments:

No metals or inorganics submitted as part of the scope of work.

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

☐Yes ☒ No ☐NA (Please explain.) Comments:

Multiple percent recoveries are reported outside of laboratory limits, the majority of which under methods AK 101 and EPA 8270 for surrogate 4-bromofluorobenzene.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

☐Yes ☒ No ☐ NA (Please explain.) Comments:

The LCS/LCSD RPD for multiple analytes did not meet QC criteria. However, the associated sample concentrations for the affected analytes were below the LOQ.

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

Comments:

Soil samples RSE-3-27, RSE-2-1, RSE-2-20, RSE-1-4, RSE-X; water samples RSE-1 and RSE-2 and RSE-X, and the LCS/LCSD.

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

☒ Yes ☐ No ☒NA (Please explain.) Comments:

Affected samples are flagged with an asterisks (*).

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

There is no effect on data quality and usability. The majority of failures identified were due to matrix interference or sample dilution for a single surrogate, 4-bromoflurorobenzene. Parent results associated with this surrogate were typically orders of magnitude below applicable cleanup levels, and comparison to the standards is unaffected. Associated sample concentrations for affected analytes in the LCS failure were below the LOQ.

Comments:

d. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?
☒Yes ☐ No ☐NA (Please explain.) Comments:

Surrogate recoveries are reported for all organic analyses.

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)
☐Yes ☒ No ☐ NA (Please explain.) Comments:

Multiple percent recoveries are reported outside of laboratory limits, the majority of which under methods AK 101 and EPA 8270 for surrogate 4-bromofluorobenzene.

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?
☒ Yes ☐ No ☐NA (Please explain.) Comments:

Affected samples are flagged with an asterisks (*).

iv. Data quality or usability affected? (Use the comment box to explain.)
Comments:

There is no effect on data quality and usability. The majority of failures identified were due to matrix interference or sample dilution for a single surrogate, 4-bromoflurorobenzene. Parent results associated with this surrogate were typically orders of magnitude below applicable cleanup levels, and comparison to the standards is unaffected.

e. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): <u>Water and Soil</u>

i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples? (If not, enter explanation below.)
☒Yes ☐ No ☐NA (Please explain.) Comments:

One trip blank included per sample cooler containing volatile samples. Two trip blanks were submitted—one for soil and one for water.

ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC? (If not, a comment explaining why must be entered below)
☒Yes ☐ No ☐ NA (Please explain.) Comments:

The trip blanks are clearly indicated on the COC.

iii. All results less than PQL?

☐Yes ☒ No ☐ NA (Please explain.) Comments:

The trip blank for soil detected GRO, Xylenes, and Toluene. No detections were reported in the trip blank for water.

iv. If above PQL, what samples are affected?

Comments:

The trip blank for soil is affected. Primary samples appear unaffected, with a majority of analytes nondetect.

v. Data quality or usability affected? (Please explain.)

Comments:

Detections in the trip blank would indicate a positive bias in primary samples. No such bias was observed, as the majority of samples were non-detect. Data quality and usability is unaffected.

f. Field Duplicate

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

☒Yes ☐ No ☐ NA (Please explain.) Comments:

One blind duplicate was submitted from the soil samples, and one blind duplicate submitted from the water samples.

ii. Submitted blind to lab?

☒Yes ☐ No ☐ NA (Please explain.) Comments:

RSE-X is a blind duplicate of RSE-1-4 for soil, and RSE-1 for water.

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

☐Yes ☒ No ☐NA (Please explain.) Comments:

RPDs calculated for soil are within target DQOs. RPDs calculated for water exceed the target DQOs, with the primary sample yielding a detection of DRO and the duplicate sample non-detect.

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

Comments:

Where results differ, the higher result will be used for regulatory purposes. Data quality and usability will not be affected.

g. Decontamination or Equipment Blank (If not used explain why).

☐Yes ☒ No ☐NA (Please explain.) Comments:

All equipment used in sampling was dedicated toward the specific sample. No decontamination procedures were employed.

i. All results less than PQL?

☐Yes ☐ No ☒NA (Please explain.) Comments:

There are no decontamination or equipment blanks. Sampling equipment was dedicated to each discrete location.

ii. If above PQL, what samples are affected?

Comments:

There are no decontamination equipment blanks.

iii. Data quality or usability affected? (Please explain.)

Data quality or usability was not affected.

Comments:

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

a. Defined and appropriate?

☒Yes ☐ No ☐NA (Please explain.) Comments:

Data flags and qualifiers are defined appropriately. Page 3 of the lab report describes the qualifiers used.

Attachment G: SGS Data Package

RESTORATION
Science & Engineering, LLC

Laboratory Report of Analysis

To: Restoration Science & Eng
911 West 8th Ave Suite 100
Anchorage, AK 99501
(907)278-1023

Report Number: **1172844**

Client Project: **RAVN Site Investigation**

Dear Arran Forbes,

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 Chuck 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.

_____

Chuck Homestead Date
Project Manager
Charles.Homestead@sgs.com

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

Case Narrative

SGS Client: **Restoration Science & Eng**
SGS Project: **1172844**
Project Name/Site: **RAVN Site Investigation**
Project Contact: **Arran Forbes**

Refer to sample receipt form for information on sample condition.

RSE-3-27 (1172844002) PS

8260C - Surrogate recovery for 4-bromofluorobenzene (45.4%) does not meet QC criteria. Sample was analyzed twice and results confirmed.
AK101 - Surrogate recovery for 4-bromofluorobenzene (31%) does not meet QC criteria. Sample was analyzed twice and results confirmed.

RSE-2-1 (1172844003) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (198 %) does not meet QC criteria due to matrix interference.
8270D SIM - PAH surrogate recovery for terphenyl-d14 (136%) does not meet QC criteria due to sample dilution (4X).

RSE-2-20 (1172844005) PS

8260C - Surrogate recovery for 4-bromofluorobenzene (41.2%) does not meet QC criteria. Sample was analyzed twice and results confirmed.
AK101 - Surrogate recovery for 4-bromofluorobenzene (36%) does not meet QC criteria. Sample was analyzed twice and results confirmed.

RSE-1-4 (1172844006) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (172%) does not meet QC criteria due to matrix interference.
8270D SIM - PAH surrogate recovery for terphenyl-d14 (164%) and 2-fluorobiphenyl (124%) do not meet QC criteria due to sample dilution (10X).

RSE-X (1172844009) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (263 %) does not meet QC criteria due to matrix interference.
8270D SIM - PAH surrogate recovery for terphenyl-d14 (166%) and 2-fluorobiphenyl (186%) do not meet QC criteria due to sample dilution (10X).

RSE-1 (1172844011) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (28.1%) does not meet QC criteria. Sample was re-extracted within hold time with PAH surrogate recovery for terphenyl-d14 (30.9%) does not meet QC criteria. Resultsa are comparable.

RSE-2 (1172844012) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (34.2%) does not meet QC criteria. Sample was re-extracted within hold time with PAH surrogate recovery for terphenyl-d14 (40.3%) does not meet QC criteria. Results are comparable.

RSE-X (1172844014) PS

8270D SIM - PAH surrogate recovery for terphenyl-d14 (28.8%) does not meet QC criteria. Sample was re-extracted within hold time with PAH surrogate recovery for terphenyl-d14 (34.4%) does not meet QC criteria. Results are comparable.

LCSD for HBN 1760089 [XXX/3746 (1387975) LCSD

8270D - LCS/LCSD RPD for several analytes do not meet QC criteria. The associated sample concentrations for this analyte are less than the LOQ. The associated samples that have analytes above the LOQ will be re-extracted.

LCSD for HBN 1760430 [XXX/3749 (1388669) LCSD

8270D - LCS/LCSD RPD for several analytes do not meet QC criteria. Additional MS/MSD added to the batch meets QC criteria.

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Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIM (PAH)				
1172844003	RSE-2-1	XMS10126	Benzo[k]fluoranthene	RP
1172844003	RSE-2-1	XMS10126	Naphthalene	SP
1172844006	RSE-1-4	XMS10126	Benzo[k]fluoranthene	RP
1172844006	RSE-1-4	XMS10126	Naphthalene	SP
1172844009	RSE-X	XMS10126	Benzo[k]fluoranthene	RP
1172844009	RSE-X	XMS10126	Naphthalene	SP
1388496	1172925009MS	XMS10087	Benzo[b]Fluoranthene	RP
1388497	1172925009MSD	XMS10087	Benzo[b]Fluoranthene	RP
SW8260C				
1172844003	RSE-2-1	VMS16802	4-Isopropyltoluene	SP
1172844006	RSE-1-4	VMS16802	4-Isopropyltoluene	SP

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 06/15/2017 5:49:23PM

Laboratory Qualifiers

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

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

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

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

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

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

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
RSE-3-5	1172844001	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-3-27	1172844002	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-2-1	1172844003	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-2-3	1172844004	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-2-20	1172844005	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-1-4	1172844006	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-1-6	1172844007	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-1-20	1172844008	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-X	1172844009	05/31/2017	06/01/2017	Soil/Solid (dry weight)
Trip Blank Soil	1172844010	05/31/2017	06/01/2017	Soil/Solid (dry weight)
RSE-1	1172844011	05/31/2017	06/01/2017	Water (Surface, Eff., Ground)
RSE-2	1172844012	05/31/2017	06/01/2017	Water (Surface, Eff., Ground)
RSE-3	1172844013	05/31/2017	06/01/2017	Water (Surface, Eff., Ground)
RSE-X	1172844014	05/31/2017	06/01/2017	Water (Surface, Eff., Ground)
H2O Trip Blank	1172844015	05/31/2017	06/01/2017	Water (Surface, Eff., Ground)

Method	Method Description
8270D SIM LV (PAH)	8270 PAH SIM GC/MS Liq/Liq ext. LV
8270D SIM (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK102	Diesel Range Organics (S)
AK102	DRO Low Volume (W)
AK101	Gasoline Range Organics (S)
AK101	Gasoline Range Organics (W)
SM21 2540G	Percent Solids SM2540G
SW8260C	VOC 8260 (S) Field Extracted
SW8260C	Volatile Organic Compounds (W) FULL

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Detectable Results Summary

Client Sample ID: **RSE-3-5**
Lab Sample ID: 1172844001

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	12.9J	mg/Kg
Volatile Fuels	Gasoline Range Organics	0.947J	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	28.0J	ug/Kg
	1,3,5-Trimethylbenzene	25.8J	ug/Kg
	Ethylbenzene	24.7J	ug/Kg
	Naphthalene	47.7	ug/Kg
	o-Xylene	17.2J	ug/Kg
	P & M -Xylene	28.0J	ug/Kg
	Styrene	159	ug/Kg
	Tetrachloroethene	74.6	ug/Kg
	Toluene	17.7J	ug/Kg
	Trichloroethene	16.9	ug/Kg
	Xylenes (total)	45.2J	ug/Kg

Client Sample ID: **RSE-3-27**
Lab Sample ID: 1172844002

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	12.8J	mg/Kg

Client Sample ID: **RSE-2-1**
Lab Sample ID: 1172844003

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	485	ug/Kg
	2-Methylnaphthalene	351	ug/Kg
	Acenaphthene	97.7J	ug/Kg
	Anthracene	164	ug/Kg
	Benzo(a)Anthracene	625	ug/Kg
	Benzo[a]pyrene	1120	ug/Kg
	Benzo[b]Fluoranthene	1370	ug/Kg
	Benzo[g,h,i]perylene	704	ug/Kg
	Benzo[k]fluoranthene	491	ug/Kg
	Chrysene	1160	ug/Kg
	Dibenzo[a,h]anthracene	185	ug/Kg
	Fluoranthene	1200	ug/Kg
	Fluorene	62.1J	ug/Kg
	Indeno[1,2,3-c,d] pyrene	619	ug/Kg
	Naphthalene	140	ug/Kg
	Phenanthrene	552	ug/Kg
	Pyrene	1410	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	1920	mg/Kg
Volatile Fuels	Gasoline Range Organics	38.2	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	215	ug/Kg
	1,3,5-Trimethylbenzene	360	ug/Kg
	4-Isopropyltoluene	65.6	ug/Kg
	Ethylbenzene	48.4	ug/Kg
	Naphthalene	338	ug/Kg
	P & M -Xylene	107	ug/Kg

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Detectable Results Summary

Client Sample ID: **RSE-2-1**
Lab Sample ID: 1172844003
Volatile GC/MS

Parameter	Result	Units
Tetrachloroethene	15.8J	ug/Kg
Toluene	53.7	ug/Kg
Trichloroethene	8.77J	ug/Kg
Xylenes (total)	107	ug/Kg

Client Sample ID: **RSE-2-3**
Lab Sample ID: 1172844004
Semivolatile Organic Fuels
Volatile Fuels

Parameter	Result	Units
Diesel Range Organics	19.3J	mg/Kg
Gasoline Range Organics	1.13J	mg/Kg

Client Sample ID: **RSE-2-20**
Lab Sample ID: 1172844005
Semivolatile Organic Fuels

Parameter	Result	Units
Diesel Range Organics	12.0J	mg/Kg

Client Sample ID: **RSE-1-4**
Lab Sample ID: 1172844006
Polynuclear Aromatics GC/MS

Parameter	Result	Units
1-Methylnaphthalene	973	ug/Kg
2-Methylnaphthalene	726	ug/Kg
Acenaphthene	195J	ug/Kg
Anthracene	214J	ug/Kg
Benzo(a)Anthracene	708	ug/Kg
Benzo[a]pyrene	1380	ug/Kg
Benzo[b]Fluoranthene	1680	ug/Kg
Benzo[g,h,i]perylene	854	ug/Kg
Benzo[k]fluoranthene	559	ug/Kg
Chrysene	1340	ug/Kg
Dibenzo[a,h]anthracene	226J	ug/Kg
Fluoranthene	1340	ug/Kg
Fluorene	106J	ug/Kg
Indeno[1,2,3-c,d] pyrene	740	ug/Kg
Naphthalene	275	ug/Kg
Phenanthrene	779	ug/Kg
Pyrene	1610	ug/Kg

Semivolatile Organic Fuels
Volatile Fuels
Volatile GC/MS

Parameter	Result	Units
Diesel Range Organics	3230	mg/Kg
Gasoline Range Organics	20.3	mg/Kg
1,2,4-Trimethylbenzene	131	ug/Kg
1,3,5-Trimethylbenzene	224	ug/Kg
4-Isopropyltoluene	44.1	ug/Kg
Ethylbenzene	23.1J	ug/Kg
Naphthalene	239	ug/Kg
P & M -Xylene	47.7J	ug/Kg
sec-Butylbenzene	35.9	ug/Kg
Tetrachloroethene	5.54J	ug/Kg
Toluene	19.0J	ug/Kg
Trichloroethene	4.82J	ug/Kg
Xylenes (total)	47.7J	ug/Kg

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Detectable Results Summary

Client Sample ID: **RSE-1-6**
Lab Sample ID: 1172844007

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	10.1J	mg/Kg
Volatile GC/MS	1,1,1-Trichloroethane	9.88J	ug/Kg
	Trichloroethene	26.0	ug/Kg

Client Sample ID: **RSE-1-20**
Lab Sample ID: 1172844008

	Parameter	Result	Units
Semivolatile Organic Fuels	Diesel Range Organics	12.1J	mg/Kg

Client Sample ID: **RSE-X**
Lab Sample ID: 1172844009

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	1360	ug/Kg
	2-Methylnaphthalene	982	ug/Kg
	Acenaphthene	197J	ug/Kg
	Anthracene	254J	ug/Kg
	Benzo(a)Anthracene	940	ug/Kg
	Benzo[a]pyrene	1680	ug/Kg
	Benzo[b]Fluoranthene	2000	ug/Kg
	Benzo[g,h,i]perylene	931	ug/Kg
	Benzo[k]fluoranthene	673	ug/Kg
	Chrysene	1730	ug/Kg
	Dibenzo[a,h]anthracene	283	ug/Kg
	Fluoranthene	1890	ug/Kg
	Fluorene	125J	ug/Kg
	Indeno[1,2,3-c,d] pyrene	826	ug/Kg
	Naphthalene	377	ug/Kg
	Phenanthrene	888	ug/Kg
	Pyrene	2180	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	3170	mg/Kg
Volatile Fuels	Gasoline Range Organics	46.9	mg/Kg
Volatile GC/MS	1,2,4-Trimethylbenzene	178	ug/Kg
	1,3,5-Trimethylbenzene	301	ug/Kg
	4-Isopropyltoluene	267	ug/Kg
	Ethylbenzene	28.8	ug/Kg
	Isopropylbenzene (Cumene)	13.2J	ug/Kg
	Naphthalene	434	ug/Kg
	P & M -Xylene	58.7	ug/Kg
	sec-Butylbenzene	50.7	ug/Kg
	Tetrachloroethene	7.48J	ug/Kg
	Toluene	21.3J	ug/Kg
	Trichloroethene	5.47J	ug/Kg
	Xylenes (total)	58.7J	ug/Kg

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Detectable Results Summary

Client Sample ID: **Trip Blank Soil**
Lab Sample ID: 1172844010

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	0.772J	mg/Kg
Volatile GC/MS	P & M -Xylene	20.1J	ug/Kg
	Toluene	13.5J	ug/Kg

Client Sample ID: **RSE-1**
Lab Sample ID: 1172844011

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.306	ug/L
	2-Methylnaphthalene	0.411	ug/L
	Acenaphthene	0.0250J	ug/L
	Benzo(a)Anthracene	0.0229J	ug/L
	Benzo[a]pyrene	0.0132J	ug/L
	Benzo[b]Fluoranthene	0.0398J	ug/L
	Benzo[g,h,i]perylene	0.0207J	ug/L
	Chrysene	0.0809	ug/L
	Fluoranthene	0.0597	ug/L
	Fluorene	0.118	ug/L
	Naphthalene	0.137	ug/L
	Phenanthrene	0.315	ug/L
	Pyrene	0.0611	ug/L
Semivolatile Organic Fuels	Diesel Range Organics	0.193J	mg/L
Volatile GC/MS	Bromodichloromethane	0.319J	ug/L
	Chloroform	0.664J	ug/L

Client Sample ID: **RSE-2**
Lab Sample ID: 1172844012

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.243	ug/L
	2-Methylnaphthalene	0.387	ug/L
	Acenaphthene	0.0176J	ug/L
	Benzo(a)Anthracene	0.0166J	ug/L
	Benzo[a]pyrene	0.0109J	ug/L
	Benzo[b]Fluoranthene	0.0274J	ug/L
	Benzo[g,h,i]perylene	0.0178J	ug/L
	Chrysene	0.0613	ug/L
	Fluoranthene	0.0452J	ug/L
	Fluorene	0.109	ug/L
	Naphthalene	0.112	ug/L
	Phenanthrene	0.305	ug/L
	Pyrene	0.0471J	ug/L
Volatile GC/MS	Bromodichloromethane	0.341J	ug/L
	Chloroform	0.870J	ug/L

Client Sample ID: **RSE-3**
Lab Sample ID: 1172844013

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	Phenanthrene	0.0163J	ug/L
Volatile GC/MS	Bromodichloromethane	0.307J	ug/L
	Chloroform	0.600J	ug/L

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Detectable Results Summary

Client Sample ID: **RSE-X**
Lab Sample ID: 1172844014

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	0.174	ug/L
	2-Methylnaphthalene	0.258	ug/L
	Benzo(a)Anthracene	0.0139J	ug/L
	Benzo[a]pyrene	0.00804J	ug/L
	Benzo[b]Fluoranthene	0.0245J	ug/L
	Benzo[g,h,i]perylene	0.0140J	ug/L
	Chrysene	0.0482	ug/L
	Fluoranthene	0.0344J	ug/L
	Fluorene	0.0781	ug/L
	Naphthalene	0.0835J	ug/L
	Phenanthrene	0.224	ug/L
	Pyrene	0.0392J	ug/L
Volatile GC/MS	Bromodichloromethane	0.334J	ug/L
	Chloroform	0.711J	ug/L

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Results of **RSE-3-5**

Client Sample ID: **RSE-3-5**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844001
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):86.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.9	J	23.1	7.17	mg/Kg	1		06/02/17 15:54
Surrogates								
5a Androstane (surr)	92.7		50-150		%	1		06/02/17 15:54

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 15:54
Container ID: 1172844001-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.081 g
Prep Extract Vol: 1 mL

J flagging is activated

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

Results of **RSE-3-5**

Client Sample ID: **RSE-3-5**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844001
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):86.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.947	J	2.77	0.832	mg/Kg	1		06/08/17 19:19
Surrogates								
4-Bromofluorobenzene (surr)	94		50-150		%	1		06/08/17 19:19

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 19:19
Container ID: 1172844001-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 09:10
Prep Initial Wt./Vol.: 73.483 g
Prep Extract Vol: 35.1244 mL

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Results of **RSE-3-5**

Client Sample ID: **RSE-3-5**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844001
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):86.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	11.1	U	22.2	6.87	ug/Kg	1		06/06/17 18:24
1,1,1-Trichloroethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,1,2,2-Tetrachloroethane	6.95	U	13.9	4.32	ug/Kg	1		06/06/17 18:24
1,1,2-Trichloroethane	5.55	U	11.1	3.44	ug/Kg	1		06/06/17 18:24
1,1-Dichloroethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,1-Dichloroethene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,1-Dichloropropene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,2,3-Trichlorobenzene	27.7	U	55.4	16.6	ug/Kg	1		06/06/17 18:24
1,2,3-Trichloropropane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,2,4-Trichlorobenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,2,4-Trimethylbenzene	28.0	J	55.4	16.6	ug/Kg	1		06/06/17 18:24
1,2-Dibromo-3-chloropropane	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
1,2-Dibromoethane	5.55	U	11.1	3.44	ug/Kg	1		06/06/17 18:24
1,2-Dichlorobenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,2-Dichloroethane	5.55	U	11.1	3.44	ug/Kg	1		06/06/17 18:24
1,2-Dichloropropane	5.55	U	11.1	3.44	ug/Kg	1		06/06/17 18:24
1,3,5-Trimethylbenzene	25.8	J	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,3-Dichlorobenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
1,3-Dichloropropane	5.55	U	11.1	3.44	ug/Kg	1		06/06/17 18:24
1,4-Dichlorobenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
2,2-Dichloropropane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
2-Butanone (MEK)	139	U	277	86.5	ug/Kg	1		06/06/17 18:24
2-Chlorotoluene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
2-Hexanone	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
4-Chlorotoluene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
4-Isopropyltoluene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
4-Methyl-2-pentanone (MIBK)	139	U	277	86.5	ug/Kg	1		06/06/17 18:24
Benzene	6.95	U	13.9	4.32	ug/Kg	1		06/06/17 18:24
Bromobenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Bromochloromethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Bromodichloromethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Bromoform	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Bromomethane	111	U	222	68.7	ug/Kg	1		06/06/17 18:24
Carbon disulfide	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
Carbon tetrachloride	6.95	U	13.9	4.32	ug/Kg	1		06/06/17 18:24
Chlorobenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Chloroethane	111	U	222	68.7	ug/Kg	1		06/06/17 18:24

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J flagging is activated

Results of **RSE-3-5**

Client Sample ID: **RSE-3-5**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844001
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):86.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Chloromethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
cis-1,2-Dichloroethene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
cis-1,3-Dichloropropene	6.95	U	13.9	4.32	ug/Kg	1		06/06/17 18:24
Dibromochloromethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Dibromomethane	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Dichlorodifluoromethane	27.7	U	55.4	16.6	ug/Kg	1		06/06/17 18:24
Ethylbenzene	24.7	J	27.7	8.65	ug/Kg	1		06/06/17 18:24
Freon-113	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
Hexachlorobutadiene	11.1	U	22.2	6.87	ug/Kg	1		06/06/17 18:24
Isopropylbenzene (Cumene)	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Methylene chloride	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
Methyl-t-butyl ether	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
Naphthalene	47.7		27.7	8.65	ug/Kg	1		06/06/17 18:24
n-Butylbenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
n-Propylbenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
o-Xylene	17.2	J	27.7	8.65	ug/Kg	1		06/06/17 18:24
P & M -Xylene	28.0	J	55.4	16.6	ug/Kg	1		06/06/17 18:24
sec-Butylbenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Styrene	159		27.7	8.65	ug/Kg	1		06/06/17 18:24
tert-Butylbenzene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
Tetrachloroethene	74.6		13.9	4.32	ug/Kg	1		06/06/17 18:24
Toluene	17.7	J	27.7	8.65	ug/Kg	1		06/06/17 18:24
trans-1,2-Dichloroethene	13.9	U	27.7	8.65	ug/Kg	1		06/06/17 18:24
trans-1,3-Dichloropropene	6.95	U	13.9	4.32	ug/Kg	1		06/06/17 18:24
Trichloroethene	16.9		11.1	3.44	ug/Kg	1		06/06/17 18:24
Trichlorofluoromethane	27.7	U	55.4	16.6	ug/Kg	1		06/06/17 18:24
Vinyl acetate	55.5	U	111	34.4	ug/Kg	1		06/06/17 18:24
Vinyl chloride	5.55	U	11.1	3.44	ug/Kg	1		06/06/17 18:24
Xylenes (total)	45.2	J	83.2	25.3	ug/Kg	1		06/06/17 18:24
Surrogates								
1,2-Dichloroethane-D4 (surr)	119		71-136		%	1		06/06/17 18:24
4-Bromofluorobenzene (surr)	122		55-151		%	1		06/06/17 18:24
Toluene-d8 (surr)	93.4		85-116		%	1		06/06/17 18:24

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J flagging is activated

Results of **RSE-3-5**

Client Sample ID: **RSE-3-5**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844001
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):86.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 18:24
Container ID: 1172844001-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 09:10
Prep Initial Wt./Vol.: 73.483 g
Prep Extract Vol: 35.1244 mL

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Results of **RSE-3-27**

Client Sample ID: **RSE-3-27**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844002
Lab Project ID: 1172844

Collection Date: 05/31/17 11:20
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.8	J	25.6	7.94	mg/Kg	1		06/02/17 16:03
Surrogates								
5a Androstane (surr)	83.1		50-150		%	1		06/02/17 16:03

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 16:03
Container ID: 1172844002-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.117 g
Prep Extract Vol: 1 mL

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Results of **RSE-3-27**

Client Sample ID: **RSE-3-27**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844002
Lab Project ID: 1172844

Collection Date: 05/31/17 11:20
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.16	U	4.32	1.30	mg/Kg	1		06/08/17 19:38
Surrogates								
4-Bromofluorobenzene (surr)	31.2	*	50-150		%	1		06/08/17 19:38

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 19:38
Container ID: 1172844002-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 11:20
Prep Initial Wt./Vol.: 55.552 g
Prep Extract Vol: 37.3515 mL

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Results of **RSE-3-27**

Client Sample ID: **RSE-3-27**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844002
Lab Project ID: 1172844

Collection Date: 05/31/17 11:20
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	17.3	U	34.6	10.7	ug/Kg	1		06/08/17 17:41
1,1,1-Trichloroethane	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,1,2,2-Tetrachloroethane	10.8	U	21.6	6.74	ug/Kg	1		06/06/17 18:40
1,1,2-Trichloroethane	8.65	U	17.3	5.36	ug/Kg	1		06/08/17 17:41
1,1-Dichloroethane	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,1-Dichloroethene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,1-Dichloropropene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,2,3-Trichlorobenzene	43.3	U	86.5	25.9	ug/Kg	1		06/06/17 18:40
1,2,3-Trichloropropane	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,2,4-Trichlorobenzene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,2,4-Trimethylbenzene	43.3	U	86.5	25.9	ug/Kg	1		06/06/17 18:40
1,2-Dibromo-3-chloropropane	86.5	U	173	53.6	ug/Kg	1		06/06/17 18:40
1,2-Dibromoethane	8.65	U	17.3	5.36	ug/Kg	1		06/08/17 17:41
1,2-Dichlorobenzene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,2-Dichloroethane	8.65	U	17.3	5.36	ug/Kg	1		06/06/17 18:40
1,2-Dichloropropane	8.65	U	17.3	5.36	ug/Kg	1		06/06/17 18:40
1,3,5-Trimethylbenzene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,3-Dichlorobenzene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
1,3-Dichloropropane	8.65	U	17.3	5.36	ug/Kg	1		06/08/17 17:41
1,4-Dichlorobenzene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
2,2-Dichloropropane	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
2-Butanone (MEK)	216	U	432	135	ug/Kg	1		06/06/17 18:40
2-Chlorotoluene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
2-Hexanone	86.5	U	173	53.6	ug/Kg	1		06/08/17 17:41
4-Chlorotoluene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
4-Isopropyltoluene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
4-Methyl-2-pentanone (MIBK)	216	U	432	135	ug/Kg	1		06/06/17 18:40
Benzene	10.8	U	21.6	6.74	ug/Kg	1		06/06/17 18:40
Bromobenzene	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
Bromochloromethane	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
Bromodichloromethane	21.6	U	43.2	13.5	ug/Kg	1		06/06/17 18:40
Bromoform	21.6	U	43.2	13.5	ug/Kg	1		06/08/17 17:41
Bromomethane	173	U	346	107	ug/Kg	1		06/06/17 18:40
Carbon disulfide	86.5	U	173	53.6	ug/Kg	1		06/06/17 18:40
Carbon tetrachloride	10.8	U	21.6	6.74	ug/Kg	1		06/06/17 18:40
Chlorobenzene	21.6	U	43.2	13.5	ug/Kg	1		06/08/17 17:41
Chloroethane	173	U	346	107	ug/Kg	1		06/06/17 18:40

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Results of **RSE-3-27**

Client Sample ID: **RSE-3-27**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844002
Lab Project ID: 1172844

Collection Date: 05/31/17 11:20
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
Chloromethane	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
cis-1,2-Dichloroethene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
cis-1,3-Dichloropropene	10.8 U		21.6	6.74	ug/Kg	1		06/06/17 18:40
Dibromochloromethane	21.6 U		43.2	13.5	ug/Kg	1		06/08/17 17:41
Dibromomethane	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
Dichlorodifluoromethane	43.3 U		86.5	25.9	ug/Kg	1		06/06/17 18:40
Ethylbenzene	21.6 U		43.2	13.5	ug/Kg	1		06/08/17 17:41
Freon-113	86.5 U		173	53.6	ug/Kg	1		06/06/17 18:40
Hexachlorobutadiene	17.3 U		34.6	10.7	ug/Kg	1		06/06/17 18:40
Isopropylbenzene (Cumene)	21.6 U		43.2	13.5	ug/Kg	1		06/08/17 17:41
Methylene chloride	86.5 U		173	53.6	ug/Kg	1		06/06/17 18:40
Methyl-t-butyl ether	86.5 U		173	53.6	ug/Kg	1		06/06/17 18:40
Naphthalene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
n-Butylbenzene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
n-Propylbenzene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
o-Xylene	21.6 U		43.2	13.5	ug/Kg	1		06/08/17 17:41
P & M -Xylene	43.3 U		86.5	25.9	ug/Kg	1		06/08/17 17:41
sec-Butylbenzene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
Styrene	21.6 U		43.2	13.5	ug/Kg	1		06/08/17 17:41
tert-Butylbenzene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
Tetrachloroethene	10.8 U		21.6	6.74	ug/Kg	1		06/08/17 17:41
Toluene	21.6 U		43.2	13.5	ug/Kg	1		06/08/17 17:41
trans-1,2-Dichloroethene	21.6 U		43.2	13.5	ug/Kg	1		06/06/17 18:40
trans-1,3-Dichloropropene	10.8 U		21.6	6.74	ug/Kg	1		06/08/17 17:41
Trichloroethene	8.65 U		17.3	5.36	ug/Kg	1		06/06/17 18:40
Trichlorofluoromethane	43.3 U		86.5	25.9	ug/Kg	1		06/06/17 18:40
Vinyl acetate	86.5 U		173	53.6	ug/Kg	1		06/06/17 18:40
Vinyl chloride	8.65 U		17.3	5.36	ug/Kg	1		06/06/17 18:40
Xylenes (total)	65.0 U		130	39.4	ug/Kg	1		06/06/17 18:40
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		71-136		%	1		06/06/17 18:40
4-Bromofluorobenzene (surr)	45.4	*	55-151		%	1		06/08/17 17:41
Toluene-d8 (surr)	94.6		85-116		%	1		06/06/17 18:40

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-3-27**

Client Sample ID: **RSE-3-27**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844002
Lab Project ID: 1172844

Collection Date: 05/31/17 11:20
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16807
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/08/17 17:41
Container ID: 1172844002-B

Prep Batch: VXX30626
Prep Method: SW5035A
Prep Date/Time: 05/31/17 11:20
Prep Initial Wt./Vol.: 55.552 g
Prep Extract Vol: 37.3515 mL

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 18:40
Container ID: 1172844002-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 11:20
Prep Initial Wt./Vol.: 55.552 g
Prep Extract Vol: 37.3515 mL

J flagging is activated

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Results of **RSE-2-1**

Client Sample ID: **RSE-2-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844003
Lab Project ID: 1172844

Collection Date: 05/31/17 12:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.1
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	485		105	31.4	ug/Kg	4		06/14/17 21:09
2-Methylnaphthalene	351		105	31.4	ug/Kg	4		06/14/17 21:09
Acenaphthene	97.7 J		105	31.4	ug/Kg	4		06/14/17 21:09
Acenaphthylene	52.5 U		105	31.4	ug/Kg	4		06/14/17 21:09
Anthracene	164		105	31.4	ug/Kg	4		06/14/17 21:09
Benzo(a)Anthracene	625		105	31.4	ug/Kg	4		06/14/17 21:09
Benzo[a]pyrene	1120		105	31.4	ug/Kg	4		06/14/17 21:09
Benzo[b]Fluoranthene	1370		105	31.4	ug/Kg	4		06/14/17 21:09
Benzo[g,h,i]perylene	704		105	31.4	ug/Kg	4		06/14/17 21:09
Benzo[k]fluoranthene	491		105	31.4	ug/Kg	4		06/14/17 21:09
Chrysene	1160		105	31.4	ug/Kg	4		06/14/17 21:09
Dibenzo[a,h]anthracene	185		105	31.4	ug/Kg	4		06/14/17 21:09
Fluoranthene	1200		105	31.4	ug/Kg	4		06/14/17 21:09
Fluorene	62.1 J		105	31.4	ug/Kg	4		06/14/17 21:09
Indeno[1,2,3-c,d] pyrene	619		105	31.4	ug/Kg	4		06/14/17 21:09
Naphthalene	140		83.8	25.1	ug/Kg	4		06/14/17 21:09
Phenanthrene	552		105	31.4	ug/Kg	4		06/14/17 21:09
Pyrene	1410		105	31.4	ug/Kg	4		06/14/17 21:09
Surrogates								
2-Fluorobiphenyl (surr)	102		46-115		%	4		06/14/17 21:09
Terphenyl-d14 (surr)	136	*	58-133		%	4		06/14/17 21:09

Batch Information

Analytical Batch: XMS10126
Analytical Method: 8270D SIM (PAH)
Analyst: S.G
Analytical Date/Time: 06/14/17 21:09
Container ID: 1172844003-A

Prep Batch: XXX37487
Prep Method: SW3550C
Prep Date/Time: 06/05/17 13:25
Prep Initial Wt./Vol.: 22.822 g
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-2-1**

Client Sample ID: **RSE-2-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844003
Lab Project ID: 1172844

Collection Date: 05/31/17 12:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	1920		424	131	mg/Kg	4		06/02/17 17:42
Surrogates								
5a Androstane (surr)	126		50-150		%	4		06/02/17 17:42

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 17:42
Container ID: 1172844003-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.104 g
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-2-1**

Client Sample ID: **RSE-2-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844003
Lab Project ID: 1172844

Collection Date: 05/31/17 12:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	38.2		3.51	1.05	mg/Kg	1		06/08/17 19:57
Surrogates								
4-Bromofluorobenzene (surr)	198	*	50-150		%	1		06/08/17 19:57

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 19:57
Container ID: 1172844003-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 12:00
Prep Initial Wt./Vol.: 41.596 g
Prep Extract Vol: 27.4615 mL

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Results of **RSE-2-1**

Client Sample ID: **RSE-2-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844003
Lab Project ID: 1172844

Collection Date: 05/31/17 12:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.1
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	14.1	U	28.1	8.70	ug/Kg	1		06/06/17 18:56
1,1,1-Trichloroethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,1,2,2-Tetrachloroethane	8.75	U	17.5	5.47	ug/Kg	1		06/06/17 18:56
1,1,2-Trichloroethane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 18:56
1,1-Dichloroethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,1-Dichloroethene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,1-Dichloropropene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,2,3-Trichlorobenzene	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 18:56
1,2,3-Trichloropropane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,2,4-Trichlorobenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,2,4-Trimethylbenzene	215		70.2	21.1	ug/Kg	1		06/06/17 18:56
1,2-Dibromo-3-chloropropane	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
1,2-Dibromoethane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 18:56
1,2-Dichlorobenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,2-Dichloroethane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 18:56
1,2-Dichloropropane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 18:56
1,3,5-Trimethylbenzene	360		35.1	10.9	ug/Kg	1		06/06/17 18:56
1,3-Dichlorobenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
1,3-Dichloropropane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 18:56
1,4-Dichlorobenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
2,2-Dichloropropane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
2-Butanone (MEK)	176	U	351	109	ug/Kg	1		06/06/17 18:56
2-Chlorotoluene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
2-Hexanone	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
4-Chlorotoluene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
4-Isopropyltoluene	65.6		35.1	10.9	ug/Kg	1		06/06/17 18:56
4-Methyl-2-pentanone (MIBK)	176	U	351	109	ug/Kg	1		06/06/17 18:56
Benzene	8.75	U	17.5	5.47	ug/Kg	1		06/06/17 18:56
Bromobenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Bromochloromethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Bromodichloromethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Bromoform	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Bromomethane	141	U	281	87.0	ug/Kg	1		06/06/17 18:56
Carbon disulfide	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
Carbon tetrachloride	8.75	U	17.5	5.47	ug/Kg	1		06/06/17 18:56
Chlorobenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Chloroethane	141	U	281	87.0	ug/Kg	1		06/06/17 18:56

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Results of **RSE-2-1**

Client Sample ID: **RSE-2-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844003
Lab Project ID: 1172844

Collection Date: 05/31/17 12:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.1
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Chloromethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
cis-1,2-Dichloroethene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
cis-1,3-Dichloropropene	8.75	U	17.5	5.47	ug/Kg	1		06/06/17 18:56
Dibromochloromethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Dibromomethane	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Dichlorodifluoromethane	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 18:56
Ethylbenzene	48.4		35.1	10.9	ug/Kg	1		06/06/17 18:56
Freon-113	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
Hexachlorobutadiene	14.1	U	28.1	8.70	ug/Kg	1		06/06/17 18:56
Isopropylbenzene (Cumene)	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Methylene chloride	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
Methyl-t-butyl ether	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
Naphthalene	338		35.1	10.9	ug/Kg	1		06/06/17 18:56
n-Butylbenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
n-Propylbenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
o-Xylene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
P & M -Xylene	107		70.2	21.1	ug/Kg	1		06/06/17 18:56
sec-Butylbenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Styrene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
tert-Butylbenzene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
Tetrachloroethene	15.8	J	17.5	5.47	ug/Kg	1		06/06/17 18:56
Toluene	53.7		35.1	10.9	ug/Kg	1		06/06/17 18:56
trans-1,2-Dichloroethene	17.6	U	35.1	10.9	ug/Kg	1		06/06/17 18:56
trans-1,3-Dichloropropene	8.75	U	17.5	5.47	ug/Kg	1		06/06/17 18:56
Trichloroethene	8.77	J	14.0	4.35	ug/Kg	1		06/06/17 18:56
Trichlorofluoromethane	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 18:56
Vinyl acetate	70.0	U	140	43.5	ug/Kg	1		06/06/17 18:56
Vinyl chloride	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 18:56
Xylenes (total)	107		105	32.0	ug/Kg	1		06/06/17 18:56
Surrogates								
1,2-Dichloroethane-D4 (surr)	112		71-136		%	1		06/06/17 18:56
4-Bromofluorobenzene (surr)	125		55-151		%	1		06/06/17 18:56
Toluene-d8 (surr)	98.5		85-116		%	1		06/06/17 18:56

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-2-1**

Client Sample ID: **RSE-2-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844003
Lab Project ID: 1172844

Collection Date: 05/31/17 12:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.1
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 18:56
Container ID: 1172844003-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 12:00
Prep Initial Wt./Vol.: 41.596 g
Prep Extract Vol: 27.4615 mL

J flagging is activated

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Results of **RSE-2-3**

Client Sample ID: **RSE-2-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844004
Lab Project ID: 1172844

Collection Date: 05/31/17 12:30
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):84.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	19.3	J	23.4	7.27	mg/Kg	1		06/02/17 16:13
Surrogates								
5a Androstane (surr)	92.4		50-150		%	1		06/02/17 16:13

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 16:13
Container ID: 1172844004-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.29 g
Prep Extract Vol: 1 mL

J flagging is activated

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Results of **RSE-2-3**

Client Sample ID: **RSE-2-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844004
Lab Project ID: 1172844

Collection Date: 05/31/17 12:30
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):84.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.13	J	3.51	1.05	mg/Kg	1		06/08/17 20:16
Surrogates								
4-Bromofluorobenzene (surr)	54.1		50-150		%	1		06/08/17 20:16

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 20:16
Container ID: 1172844004-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 12:30
Prep Initial Wt./Vol.: 57.02 g
Prep Extract Vol: 33.8328 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

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Results of **RSE-2-3**

Client Sample ID: **RSE-2-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844004
Lab Project ID: 1172844

Collection Date: 05/31/17 12:30
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):84.5
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	14.1	U	28.1	8.71	ug/Kg	1		06/06/17 19:12
1,1,1-Trichloroethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,1,2,2-Tetrachloroethane	8.80	U	17.6	5.48	ug/Kg	1		06/06/17 19:12
1,1,2-Trichloroethane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
1,1-Dichloroethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,1-Dichloroethene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,1-Dichloropropene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,2,3-Trichlorobenzene	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 19:12
1,2,3-Trichloropropane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,2,4-Trichlorobenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,2,4-Trimethylbenzene	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 19:12
1,2-Dibromo-3-chloropropane	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
1,2-Dibromoethane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
1,2-Dichlorobenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,2-Dichloroethane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
1,2-Dichloropropane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
1,3,5-Trimethylbenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,3-Dichlorobenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
1,3-Dichloropropane	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
1,4-Dichlorobenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
2,2-Dichloropropane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
2-Butanone (MEK)	176	U	351	110	ug/Kg	1		06/06/17 19:12
2-Chlorotoluene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
2-Hexanone	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
4-Chlorotoluene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
4-Isopropyltoluene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
4-Methyl-2-pentanone (MIBK)	176	U	351	110	ug/Kg	1		06/06/17 19:12
Benzene	8.80	U	17.6	5.48	ug/Kg	1		06/06/17 19:12
Bromobenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Bromochloromethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Bromodichloromethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Bromoform	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Bromomethane	141	U	281	87.1	ug/Kg	1		06/06/17 19:12
Carbon disulfide	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
Carbon tetrachloride	8.80	U	17.6	5.48	ug/Kg	1		06/06/17 19:12
Chlorobenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Chloroethane	141	U	281	87.1	ug/Kg	1		06/06/17 19:12

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-2-3**

Client Sample ID: **RSE-2-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844004
Lab Project ID: 1172844

Collection Date: 05/31/17 12:30
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):84.5
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Chloromethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
cis-1,2-Dichloroethene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
cis-1,3-Dichloropropene	8.80	U	17.6	5.48	ug/Kg	1		06/06/17 19:12
Dibromochloromethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Dibromomethane	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Dichlorodifluoromethane	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 19:12
Ethylbenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Freon-113	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
Hexachlorobutadiene	14.1	U	28.1	8.71	ug/Kg	1		06/06/17 19:12
Isopropylbenzene (Cumene)	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Methylene chloride	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
Methyl-t-butyl ether	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
Naphthalene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
n-Butylbenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
n-Propylbenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
o-Xylene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
P & M -Xylene	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 19:12
sec-Butylbenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Styrene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
tert-Butylbenzene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
Tetrachloroethene	8.80	U	17.6	5.48	ug/Kg	1		06/06/17 19:12
Toluene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
trans-1,2-Dichloroethene	17.6	U	35.1	11.0	ug/Kg	1		06/06/17 19:12
trans-1,3-Dichloropropene	8.80	U	17.6	5.48	ug/Kg	1		06/06/17 19:12
Trichloroethene	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
Trichlorofluoromethane	35.1	U	70.2	21.1	ug/Kg	1		06/06/17 19:12
Vinyl acetate	70.0	U	140	43.5	ug/Kg	1		06/06/17 19:12
Vinyl chloride	7.00	U	14.0	4.35	ug/Kg	1		06/06/17 19:12
Xylenes (total)	52.5	U	105	32.0	ug/Kg	1		06/06/17 19:12
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		71-136		%	1		06/06/17 19:12
4-Bromofluorobenzene (surr)	66.2		55-151		%	1		06/06/17 19:12
Toluene-d8 (surr)	96.7		85-116		%	1		06/06/17 19:12

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J flagging is activated

Results of **RSE-2-3**

Client Sample ID: **RSE-2-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844004
Lab Project ID: 1172844

Collection Date: 05/31/17 12:30
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):84.5
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 19:12
Container ID: 1172844004-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 12:30
Prep Initial Wt./Vol.: 57.02 g
Prep Extract Vol: 33.8328 mL

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Results of **RSE-2-20**

Client Sample ID: **RSE-2-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844005
Lab Project ID: 1172844

Collection Date: 05/31/17 14:25
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.0	J	25.7	7.95	mg/Kg	1		06/02/17 16:23
Surrogates								
5a Androstane (surr)	88.3		50-150		%	1		06/02/17 16:23

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 16:23
Container ID: 1172844005-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.118 g
Prep Extract Vol: 1 mL

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Results of **RSE-2-20**

Client Sample ID: **RSE-2-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844005
Lab Project ID: 1172844

Collection Date: 05/31/17 14:25
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.02	U	4.04	1.21	mg/Kg	1		06/08/17 20:34
Surrogates								
4-Bromofluorobenzene (surr)	35.5	*	50-150		%	1		06/08/17 20:34

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 20:34
Container ID: 1172844005-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:25
Prep Initial Wt./Vol.: 61.748 g
Prep Extract Vol: 38.7908 mL

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Results of **RSE-2-20**

Client Sample ID: **RSE-2-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844005
Lab Project ID: 1172844

Collection Date: 05/31/17 14:25
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.7
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	16.2	U	32.4	10.0	ug/Kg	1		06/08/17 17:57
1,1,1-Trichloroethane	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,1,2,2-Tetrachloroethane	10.1	U	20.2	6.31	ug/Kg	1		06/06/17 19:28
1,1,2-Trichloroethane	8.10	U	16.2	5.01	ug/Kg	1		06/08/17 17:57
1,1-Dichloroethane	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,1-Dichloroethene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,1-Dichloropropene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,2,3-Trichlorobenzene	40.5	U	80.9	24.3	ug/Kg	1		06/06/17 19:28
1,2,3-Trichloropropane	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,2,4-Trichlorobenzene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,2,4-Trimethylbenzene	40.5	U	80.9	24.3	ug/Kg	1		06/06/17 19:28
1,2-Dibromo-3-chloropropane	81.0	U	162	50.1	ug/Kg	1		06/06/17 19:28
1,2-Dibromoethane	8.10	U	16.2	5.01	ug/Kg	1		06/08/17 17:57
1,2-Dichlorobenzene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,2-Dichloroethane	8.10	U	16.2	5.01	ug/Kg	1		06/06/17 19:28
1,2-Dichloropropane	8.10	U	16.2	5.01	ug/Kg	1		06/06/17 19:28
1,3,5-Trimethylbenzene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,3-Dichlorobenzene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
1,3-Dichloropropane	8.10	U	16.2	5.01	ug/Kg	1		06/08/17 17:57
1,4-Dichlorobenzene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
2,2-Dichloropropane	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
2-Butanone (MEK)	202	U	404	126	ug/Kg	1		06/06/17 19:28
2-Chlorotoluene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
2-Hexanone	81.0	U	162	50.1	ug/Kg	1		06/08/17 17:57
4-Chlorotoluene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
4-Isopropyltoluene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
4-Methyl-2-pentanone (MIBK)	202	U	404	126	ug/Kg	1		06/06/17 19:28
Benzene	10.1	U	20.2	6.31	ug/Kg	1		06/06/17 19:28
Bromobenzene	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
Bromochloromethane	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
Bromodichloromethane	20.2	U	40.4	12.6	ug/Kg	1		06/06/17 19:28
Bromoform	20.2	U	40.4	12.6	ug/Kg	1		06/08/17 17:57
Bromomethane	162	U	324	100	ug/Kg	1		06/06/17 19:28
Carbon disulfide	81.0	U	162	50.1	ug/Kg	1		06/06/17 19:28
Carbon tetrachloride	10.1	U	20.2	6.31	ug/Kg	1		06/06/17 19:28
Chlorobenzene	20.2	U	40.4	12.6	ug/Kg	1		06/08/17 17:57
Chloroethane	162	U	324	100	ug/Kg	1		06/06/17 19:28

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J flagging is activated

Results of **RSE-2-20**

Client Sample ID: **RSE-2-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844005
Lab Project ID: 1172844

Collection Date: 05/31/17 14:25
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.7
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
Chloromethane	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
cis-1,2-Dichloroethene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
cis-1,3-Dichloropropene	10.1 U		20.2	6.31	ug/Kg	1		06/06/17 19:28
Dibromochloromethane	20.2 U		40.4	12.6	ug/Kg	1		06/08/17 17:57
Dibromomethane	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
Dichlorodifluoromethane	40.5 U		80.9	24.3	ug/Kg	1		06/06/17 19:28
Ethylbenzene	20.2 U		40.4	12.6	ug/Kg	1		06/08/17 17:57
Freon-113	81.0 U		162	50.1	ug/Kg	1		06/06/17 19:28
Hexachlorobutadiene	16.2 U		32.4	10.0	ug/Kg	1		06/06/17 19:28
Isopropylbenzene (Cumene)	20.2 U		40.4	12.6	ug/Kg	1		06/08/17 17:57
Methylene chloride	81.0 U		162	50.1	ug/Kg	1		06/06/17 19:28
Methyl-t-butyl ether	81.0 U		162	50.1	ug/Kg	1		06/06/17 19:28
Naphthalene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
n-Butylbenzene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
n-Propylbenzene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
o-Xylene	20.2 U		40.4	12.6	ug/Kg	1		06/08/17 17:57
P & M -Xylene	40.5 U		80.9	24.3	ug/Kg	1		06/08/17 17:57
sec-Butylbenzene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
Styrene	20.2 U		40.4	12.6	ug/Kg	1		06/08/17 17:57
tert-Butylbenzene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
Tetrachloroethene	10.1 U		20.2	6.31	ug/Kg	1		06/08/17 17:57
Toluene	20.2 U		40.4	12.6	ug/Kg	1		06/08/17 17:57
trans-1,2-Dichloroethene	20.2 U		40.4	12.6	ug/Kg	1		06/06/17 19:28
trans-1,3-Dichloropropene	10.1 U		20.2	6.31	ug/Kg	1		06/08/17 17:57
Trichloroethene	8.10 U		16.2	5.01	ug/Kg	1		06/06/17 19:28
Trichlorofluoromethane	40.5 U		80.9	24.3	ug/Kg	1		06/06/17 19:28
Vinyl acetate	81.0 U		162	50.1	ug/Kg	1		06/06/17 19:28
Vinyl chloride	8.10 U		16.2	5.01	ug/Kg	1		06/06/17 19:28
Xylenes (total)	60.5 U		121	36.9	ug/Kg	1		06/06/17 19:28
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		71-136		%	1		06/06/17 19:28
4-Bromofluorobenzene (surr)	41.2	*	55-151		%	1		06/08/17 17:57
Toluene-d8 (surr)	96.3		85-116		%	1		06/06/17 19:28

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Results of **RSE-2-20**

Client Sample ID: **RSE-2-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844005
Lab Project ID: 1172844

Collection Date: 05/31/17 14:25
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):77.7
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16807
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/08/17 17:57
Container ID: 1172844005-B

Prep Batch: VXX30626
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:25
Prep Initial Wt./Vol.: 61.748 g
Prep Extract Vol: 38.7908 mL

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 19:28
Container ID: 1172844005-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 14:25
Prep Initial Wt./Vol.: 61.748 g
Prep Extract Vol: 38.7908 mL

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Results of **RSE-1-4**

Client Sample ID: **RSE-1-4**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844006
Lab Project ID: 1172844

Collection Date: 05/31/17 17:15
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	973		263	79.0	ug/Kg	10		06/14/17 21:30
2-Methylnaphthalene	726		263	79.0	ug/Kg	10		06/14/17 21:30
Acenaphthene	195 J		263	79.0	ug/Kg	10		06/14/17 21:30
Acenaphthylene	132 U		263	79.0	ug/Kg	10		06/14/17 21:30
Anthracene	214 J		263	79.0	ug/Kg	10		06/14/17 21:30
Benzo(a)Anthracene	708		263	79.0	ug/Kg	10		06/14/17 21:30
Benzo[a]pyrene	1380		263	79.0	ug/Kg	10		06/14/17 21:30
Benzo[b]Fluoranthene	1680		263	79.0	ug/Kg	10		06/14/17 21:30
Benzo[g,h,i]perylene	854		263	79.0	ug/Kg	10		06/14/17 21:30
Benzo[k]fluoranthene	559		263	79.0	ug/Kg	10		06/14/17 21:30
Chrysene	1340		263	79.0	ug/Kg	10		06/14/17 21:30
Dibenzo[a,h]anthracene	226 J		263	79.0	ug/Kg	10		06/14/17 21:30
Fluoranthene	1340		263	79.0	ug/Kg	10		06/14/17 21:30
Fluorene	106 J		263	79.0	ug/Kg	10		06/14/17 21:30
Indeno[1,2,3-c,d] pyrene	740		263	79.0	ug/Kg	10		06/14/17 21:30
Naphthalene	275		211	63.2	ug/Kg	10		06/14/17 21:30
Phenanthrene	779		263	79.0	ug/Kg	10		06/14/17 21:30
Pyrene	1610		263	79.0	ug/Kg	10		06/14/17 21:30
Surrogates								
2-Fluorobiphenyl (surr)	124	*	46-115		%	10		06/14/17 21:30
Terphenyl-d14 (surr)	164	*	58-133		%	10		06/14/17 21:30

Batch Information

Analytical Batch: XMS10126
Analytical Method: 8270D SIM (PAH)
Analyst: S.G
Analytical Date/Time: 06/14/17 21:30
Container ID: 1172844006-A

Prep Batch: XXX37487
Prep Method: SW3550C
Prep Date/Time: 06/05/17 13:25
Prep Initial Wt./Vol.: 22.675 g
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1-4**

Client Sample ID: **RSE-1-4**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844006
Lab Project ID: 1172844

Collection Date: 05/31/17 17:15
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3230		421	130	mg/Kg	4		06/02/17 17:52
Surrogates								
5a Androstane (surr)	108		50-150		%	4		06/02/17 17:52

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 17:52
Container ID: 1172844006-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.308 g
Prep Extract Vol: 5 mL

J flagging is activated

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Results of **RSE-1-4**

Client Sample ID: **RSE-1-4**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844006
Lab Project ID: 1172844

Collection Date: 05/31/17 17:15
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	20.3		2.41	0.722	mg/Kg	1		06/08/17 20:53
Surrogates								
4-Bromofluorobenzene (surr)	172	*	50-150		%	1		06/08/17 20:53

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 20:53
Container ID: 1172844006-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 17:15
Prep Initial Wt./Vol.: 63.287 g
Prep Extract Vol: 28.6998 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1-4**

Client Sample ID: **RSE-1-4**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844006
Lab Project ID: 1172844

Collection Date: 05/31/17 17:15
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	9.65	U	19.3	5.97	ug/Kg	1		06/06/17 19:44
1,1,1-Trichloroethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,1,2,2-Tetrachloroethane	6.00	U	12.0	3.76	ug/Kg	1		06/06/17 19:44
1,1,2-Trichloroethane	4.82	U	9.63	2.99	ug/Kg	1		06/06/17 19:44
1,1-Dichloroethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,1-Dichloroethene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,1-Dichloropropene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,2,3-Trichlorobenzene	24.1	U	48.2	14.4	ug/Kg	1		06/06/17 19:44
1,2,3-Trichloropropane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,2,4-Trichlorobenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,2,4-Trimethylbenzene	131		48.2	14.4	ug/Kg	1		06/06/17 19:44
1,2-Dibromo-3-chloropropane	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
1,2-Dibromoethane	4.82	U	9.63	2.99	ug/Kg	1		06/06/17 19:44
1,2-Dichlorobenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,2-Dichloroethane	4.82	U	9.63	2.99	ug/Kg	1		06/06/17 19:44
1,2-Dichloropropane	4.82	U	9.63	2.99	ug/Kg	1		06/06/17 19:44
1,3,5-Trimethylbenzene	224		24.1	7.51	ug/Kg	1		06/06/17 19:44
1,3-Dichlorobenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
1,3-Dichloropropane	4.82	U	9.63	2.99	ug/Kg	1		06/06/17 19:44
1,4-Dichlorobenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
2,2-Dichloropropane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
2-Butanone (MEK)	121	U	241	75.1	ug/Kg	1		06/06/17 19:44
2-Chlorotoluene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
2-Hexanone	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
4-Chlorotoluene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
4-Isopropyltoluene	44.1		24.1	7.51	ug/Kg	1		06/06/17 19:44
4-Methyl-2-pentanone (MIBK)	121	U	241	75.1	ug/Kg	1		06/06/17 19:44
Benzene	6.00	U	12.0	3.76	ug/Kg	1		06/06/17 19:44
Bromobenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Bromochloromethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Bromodichloromethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Bromoform	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Bromomethane	96.5	U	193	59.7	ug/Kg	1		06/06/17 19:44
Carbon disulfide	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
Carbon tetrachloride	6.00	U	12.0	3.76	ug/Kg	1		06/06/17 19:44
Chlorobenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Chloroethane	96.5	U	193	59.7	ug/Kg	1		06/06/17 19:44

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J flagging is activated

Results of **RSE-1-4**

Client Sample ID: **RSE-1-4**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844006
Lab Project ID: 1172844

Collection Date: 05/31/17 17:15
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Chloromethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
cis-1,2-Dichloroethene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
cis-1,3-Dichloropropene	6.00	U	12.0	3.76	ug/Kg	1		06/06/17 19:44
Dibromochloromethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Dibromomethane	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Dichlorodifluoromethane	24.1	U	48.2	14.4	ug/Kg	1		06/06/17 19:44
Ethylbenzene	23.1	J	24.1	7.51	ug/Kg	1		06/06/17 19:44
Freon-113	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
Hexachlorobutadiene	9.65	U	19.3	5.97	ug/Kg	1		06/06/17 19:44
Isopropylbenzene (Cumene)	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Methylene chloride	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
Methyl-t-butyl ether	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
Naphthalene	239		24.1	7.51	ug/Kg	1		06/06/17 19:44
n-Butylbenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
n-Propylbenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
o-Xylene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
P & M -Xylene	47.7	J	48.2	14.4	ug/Kg	1		06/06/17 19:44
sec-Butylbenzene	35.9		24.1	7.51	ug/Kg	1		06/06/17 19:44
Styrene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
tert-Butylbenzene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
Tetrachloroethene	5.54	J	12.0	3.76	ug/Kg	1		06/06/17 19:44
Toluene	19.0	J	24.1	7.51	ug/Kg	1		06/06/17 19:44
trans-1,2-Dichloroethene	12.1	U	24.1	7.51	ug/Kg	1		06/06/17 19:44
trans-1,3-Dichloropropene	6.00	U	12.0	3.76	ug/Kg	1		06/06/17 19:44
Trichloroethene	4.82	J	9.63	2.99	ug/Kg	1		06/06/17 19:44
Trichlorofluoromethane	24.1	U	48.2	14.4	ug/Kg	1		06/06/17 19:44
Vinyl acetate	48.1	U	96.3	29.9	ug/Kg	1		06/06/17 19:44
Vinyl chloride	4.82	U	9.63	2.99	ug/Kg	1		06/06/17 19:44
Xylenes (total)	47.7	J	72.2	22.0	ug/Kg	1		06/06/17 19:44
Surrogates								
1,2-Dichloroethane-D4 (surr)	120		71-136		%	1		06/06/17 19:44
4-Bromofluorobenzene (surr)	122		55-151		%	1		06/06/17 19:44
Toluene-d8 (surr)	96.7		85-116		%	1		06/06/17 19:44

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Results of **RSE-1-4**

Client Sample ID: **RSE-1-4**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844006
Lab Project ID: 1172844

Collection Date: 05/31/17 17:15
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):94.2
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 19:44
Container ID: 1172844006-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 17:15
Prep Initial Wt./Vol.: 63.287 g
Prep Extract Vol: 28.6998 mL

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Results of **RSE-1-6**

Client Sample ID: **RSE-1-6**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844007
Lab Project ID: 1172844

Collection Date: 05/31/17 17:35
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10.1	J	22.9	7.11	mg/Kg	1		06/02/17 16:53
Surrogates								
5a Androstane (surr)	95.6		50-150		%	1		06/02/17 16:53

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 16:53
Container ID: 1172844007-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.033 g
Prep Extract Vol: 1 mL

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Results of **RSE-1-6**

Client Sample ID: **RSE-1-6**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844007
Lab Project ID: 1172844

Collection Date: 05/31/17 17:35
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.41	U	2.82	0.847	mg/Kg	1		06/08/17 21:12
Surrogates								
4-Bromofluorobenzene (surr)	93.8		50-150		%	1		06/08/17 21:12

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 21:12
Container ID: 1172844007-B

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 17:35
Prep Initial Wt./Vol.: 68.812 g
Prep Extract Vol: 33.8619 mL

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Results of **RSE-1-6**

Client Sample ID: **RSE-1-6**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844007
Lab Project ID: 1172844

Collection Date: 05/31/17 17:35
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	11.3	U	22.6	7.00	ug/Kg	1		06/06/17 20:00
1,1,1-Trichloroethane	9.88	J	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,1,2,2-Tetrachloroethane	7.05	U	14.1	4.41	ug/Kg	1		06/06/17 20:00
1,1,2-Trichloroethane	5.65	U	11.3	3.50	ug/Kg	1		06/06/17 20:00
1,1-Dichloroethane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,1-Dichloroethene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,1-Dichloropropene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,2,3-Trichlorobenzene	28.3	U	56.5	16.9	ug/Kg	1		06/06/17 20:00
1,2,3-Trichloropropane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,2,4-Trichlorobenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,2,4-Trimethylbenzene	28.3	U	56.5	16.9	ug/Kg	1		06/06/17 20:00
1,2-Dibromo-3-chloropropane	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
1,2-Dibromoethane	5.65	U	11.3	3.50	ug/Kg	1		06/06/17 20:00
1,2-Dichlorobenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,2-Dichloroethane	5.65	U	11.3	3.50	ug/Kg	1		06/06/17 20:00
1,2-Dichloropropane	5.65	U	11.3	3.50	ug/Kg	1		06/06/17 20:00
1,3,5-Trimethylbenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,3-Dichlorobenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
1,3-Dichloropropane	5.65	U	11.3	3.50	ug/Kg	1		06/06/17 20:00
1,4-Dichlorobenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
2,2-Dichloropropane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
2-Butanone (MEK)	141	U	282	88.1	ug/Kg	1		06/06/17 20:00
2-Chlorotoluene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
2-Hexanone	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
4-Chlorotoluene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
4-Isopropyltoluene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
4-Methyl-2-pentanone (MIBK)	141	U	282	88.1	ug/Kg	1		06/06/17 20:00
Benzene	7.05	U	14.1	4.41	ug/Kg	1		06/06/17 20:00
Bromobenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Bromochloromethane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Bromodichloromethane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Bromoform	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Bromomethane	113	U	226	70.0	ug/Kg	1		06/06/17 20:00
Carbon disulfide	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
Carbon tetrachloride	7.05	U	14.1	4.41	ug/Kg	1		06/06/17 20:00
Chlorobenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Chloroethane	113	U	226	70.0	ug/Kg	1		06/06/17 20:00

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J flagging is activated

Results of **RSE-1-6**

Client Sample ID: **RSE-1-6**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844007
Lab Project ID: 1172844

Collection Date: 05/31/17 17:35
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Chloromethane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
cis-1,2-Dichloroethene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
cis-1,3-Dichloropropene	7.05	U	14.1	4.41	ug/Kg	1		06/06/17 20:00
Dibromochloromethane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Dibromomethane	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Dichlorodifluoromethane	28.3	U	56.5	16.9	ug/Kg	1		06/06/17 20:00
Ethylbenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Freon-113	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
Hexachlorobutadiene	11.3	U	22.6	7.00	ug/Kg	1		06/06/17 20:00
Isopropylbenzene (Cumene)	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Methylene chloride	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
Methyl-t-butyl ether	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
Naphthalene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
n-Butylbenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
n-Propylbenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
o-Xylene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
P & M -Xylene	28.3	U	56.5	16.9	ug/Kg	1		06/06/17 20:00
sec-Butylbenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Styrene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
tert-Butylbenzene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
Tetrachloroethene	7.05	U	14.1	4.41	ug/Kg	1		06/06/17 20:00
Toluene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
trans-1,2-Dichloroethene	14.1	U	28.2	8.81	ug/Kg	1		06/06/17 20:00
trans-1,3-Dichloropropene	7.05	U	14.1	4.41	ug/Kg	1		06/06/17 20:00
Trichloroethene	26.0		11.3	3.50	ug/Kg	1		06/06/17 20:00
Trichlorofluoromethane	28.3	U	56.5	16.9	ug/Kg	1		06/06/17 20:00
Vinyl acetate	56.5	U	113	35.0	ug/Kg	1		06/06/17 20:00
Vinyl chloride	5.65	U	11.3	3.50	ug/Kg	1		06/06/17 20:00
Xylenes (total)	42.4	U	84.7	25.8	ug/Kg	1		06/06/17 20:00
Surrogates								
1,2-Dichloroethane-D4 (surr)	108		71-136		%	1		06/06/17 20:00
4-Bromofluorobenzene (surr)	119		55-151		%	1		06/06/17 20:00
Toluene-d8 (surr)	94.9		85-116		%	1		06/06/17 20:00

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Results of **RSE-1-6**

Client Sample ID: **RSE-1-6**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844007
Lab Project ID: 1172844

Collection Date: 05/31/17 17:35
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):87.1
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 20:00
Container ID: 1172844007-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 17:35
Prep Initial Wt./Vol.: 68.812 g
Prep Extract Vol: 33.8619 mL

J flagging is activated

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Results of **RSE-1-20**

Client Sample ID: **RSE-1-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844008
Lab Project ID: 1172844

Collection Date: 05/31/17 18:55
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	12.1	J	25.1	7.77	mg/Kg	1		06/02/17 17:02
Surrogates								
5a Androstane (surr)	89.7		50-150		%	1		06/02/17 17:02

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 17:02
Container ID: 1172844008-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.371 g
Prep Extract Vol: 1 mL

J flagging is activated

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Results of **RSE-1-20**

Client Sample ID: **RSE-1-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844008
Lab Project ID: 1172844

Collection Date: 05/31/17 18:55
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.29	U	4.57	1.37	mg/Kg	1		06/09/17 02:29
Surrogates								
4-Bromofluorobenzene (surr)	68.4		50-150		%	1		06/09/17 02:29

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 02:29
Container ID: 1172844008-B

Prep Batch: VXX30625
Prep Method: SW5035A
Prep Date/Time: 05/31/17 18:55
Prep Initial Wt./Vol.: 49.179 g
Prep Extract Vol: 35.4102 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1-20**

Client Sample ID: **RSE-1-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844008
Lab Project ID: 1172844

Collection Date: 05/31/17 18:55
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	18.3	U	36.5	11.3	ug/Kg	1		06/06/17 20:16
1,1,1-Trichloroethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,1,2,2-Tetrachloroethane	11.4	U	22.8	7.12	ug/Kg	1		06/06/17 20:16
1,1,2-Trichloroethane	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
1,1-Dichloroethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,1-Dichloroethene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,1-Dichloropropene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,2,3-Trichlorobenzene	45.6	U	91.3	27.4	ug/Kg	1		06/06/17 20:16
1,2,3-Trichloropropane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,2,4-Trichlorobenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,2,4-Trimethylbenzene	45.6	U	91.3	27.4	ug/Kg	1		06/06/17 20:16
1,2-Dibromo-3-chloropropane	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
1,2-Dibromoethane	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
1,2-Dichlorobenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,2-Dichloroethane	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
1,2-Dichloropropane	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
1,3,5-Trimethylbenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,3-Dichlorobenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
1,3-Dichloropropane	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
1,4-Dichlorobenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
2,2-Dichloropropane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
2-Butanone (MEK)	229	U	457	142	ug/Kg	1		06/06/17 20:16
2-Chlorotoluene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
2-Hexanone	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
4-Chlorotoluene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
4-Isopropyltoluene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
4-Methyl-2-pentanone (MIBK)	229	U	457	142	ug/Kg	1		06/06/17 20:16
Benzene	11.4	U	22.8	7.12	ug/Kg	1		06/06/17 20:16
Bromobenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Bromochloromethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Bromodichloromethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Bromoform	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Bromomethane	183	U	365	113	ug/Kg	1		06/06/17 20:16
Carbon disulfide	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
Carbon tetrachloride	11.4	U	22.8	7.12	ug/Kg	1		06/06/17 20:16
Chlorobenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Chloroethane	183	U	365	113	ug/Kg	1		06/06/17 20:16

Results of **RSE-1-20**

Client Sample ID: **RSE-1-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844008
Lab Project ID: 1172844

Collection Date: 05/31/17 18:55
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Chloromethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
cis-1,2-Dichloroethene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
cis-1,3-Dichloropropene	11.4	U	22.8	7.12	ug/Kg	1		06/06/17 20:16
Dibromochloromethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Dibromomethane	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Dichlorodifluoromethane	45.6	U	91.3	27.4	ug/Kg	1		06/06/17 20:16
Ethylbenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Freon-113	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
Hexachlorobutadiene	18.3	U	36.5	11.3	ug/Kg	1		06/06/17 20:16
Isopropylbenzene (Cumene)	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Methylene chloride	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
Methyl-t-butyl ether	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
Naphthalene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
n-Butylbenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
n-Propylbenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
o-Xylene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
P & M -Xylene	45.6	U	91.3	27.4	ug/Kg	1		06/06/17 20:16
sec-Butylbenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Styrene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
tert-Butylbenzene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
Tetrachloroethene	11.4	U	22.8	7.12	ug/Kg	1		06/06/17 20:16
Toluene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
trans-1,2-Dichloroethene	22.9	U	45.7	14.2	ug/Kg	1		06/06/17 20:16
trans-1,3-Dichloropropene	11.4	U	22.8	7.12	ug/Kg	1		06/06/17 20:16
Trichloroethene	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
Trichlorofluoromethane	45.6	U	91.3	27.4	ug/Kg	1		06/06/17 20:16
Vinyl acetate	91.5	U	183	56.6	ug/Kg	1		06/06/17 20:16
Vinyl chloride	9.15	U	18.3	5.66	ug/Kg	1		06/06/17 20:16
Xylenes (total)	68.5	U	137	41.6	ug/Kg	1		06/06/17 20:16
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		71-136		%	1		06/06/17 20:16
4-Bromofluorobenzene (surr)	87.8		55-151		%	1		06/06/17 20:16
Toluene-d8 (surr)	97.9		85-116		%	1		06/06/17 20:16

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Results of **RSE-1-20**

Client Sample ID: **RSE-1-20**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844008
Lab Project ID: 1172844

Collection Date: 05/31/17 18:55
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):78.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 20:16
Container ID: 1172844008-B

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 18:55
Prep Initial Wt./Vol.: 49.179 g
Prep Extract Vol: 35.4102 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844009
Lab Project ID: 1172844

Collection Date: 05/31/17 18:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):93.8
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	1360		265	79.5	ug/Kg	10		06/14/17 21:50
2-Methylnaphthalene	982		265	79.5	ug/Kg	10		06/14/17 21:50
Acenaphthene	197 J		265	79.5	ug/Kg	10		06/14/17 21:50
Acenaphthylene	133 U		265	79.5	ug/Kg	10		06/14/17 21:50
Anthracene	254 J		265	79.5	ug/Kg	10		06/14/17 21:50
Benzo(a)Anthracene	940		265	79.5	ug/Kg	10		06/14/17 21:50
Benzo[a]pyrene	1680		265	79.5	ug/Kg	10		06/14/17 21:50
Benzo[b]Fluoranthene	2000		265	79.5	ug/Kg	10		06/14/17 21:50
Benzo[g,h,i]perylene	931		265	79.5	ug/Kg	10		06/14/17 21:50
Benzo[k]fluoranthene	673		265	79.5	ug/Kg	10		06/14/17 21:50
Chrysene	1730		265	79.5	ug/Kg	10		06/14/17 21:50
Dibenzo[a,h]anthracene	283		265	79.5	ug/Kg	10		06/14/17 21:50
Fluoranthene	1890		265	79.5	ug/Kg	10		06/14/17 21:50
Fluorene	125 J		265	79.5	ug/Kg	10		06/14/17 21:50
Indeno[1,2,3-c,d] pyrene	826		265	79.5	ug/Kg	10		06/14/17 21:50
Naphthalene	377		212	63.6	ug/Kg	10		06/14/17 21:50
Phenanthrene	888		265	79.5	ug/Kg	10		06/14/17 21:50
Pyrene	2180		265	79.5	ug/Kg	10		06/14/17 21:50
Surrogates								
2-Fluorobiphenyl (surr)	186	*	46-115		%	10		06/14/17 21:50
Terphenyl-d14 (surr)	166	*	58-133		%	10		06/14/17 21:50

Batch Information

Analytical Batch: XMS10126
Analytical Method: 8270D SIM (PAH)
Analyst: S.G
Analytical Date/Time: 06/14/17 21:50
Container ID: 1172844009-A

Prep Batch: XXX37487
Prep Method: SW3550C
Prep Date/Time: 06/05/17 13:25
Prep Initial Wt./Vol.: 22.624 g
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844009
Lab Project ID: 1172844

Collection Date: 05/31/17 18:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):93.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	3170		425	132	mg/Kg	4		06/02/17 18:01
Surrogates								
5a Androstane (surr)	108		50-150		%	4		06/02/17 18:01

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Analyst: FDR
Analytical Date/Time: 06/02/17 18:01
Container ID: 1172844009-A

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 06/02/17 09:09
Prep Initial Wt./Vol.: 30.092 g
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844009
Lab Project ID: 1172844

Collection Date: 05/31/17 18:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):93.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	46.9		2.88	0.863	mg/Kg	1		06/09/17 02:47
Surrogates								
4-Bromofluorobenzene (surr)	263	*	50-150		%	1		06/09/17 02:47

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 02:47
Container ID: 1172844009-B

Prep Batch: VXX30625
Prep Method: SW5035A
Prep Date/Time: 05/31/17 18:00
Prep Initial Wt./Vol.: 52.341 g
Prep Extract Vol: 28.256 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844009
Lab Project ID: 1172844

Collection Date: 05/31/17 18:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):93.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	11.5	U	23.0	7.14	ug/Kg	1		06/06/17 20:12
1,1,1-Trichloroethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,1,2,2-Tetrachloroethane	7.20	U	14.4	4.49	ug/Kg	1		06/06/17 20:12
1,1,2-Trichloroethane	5.75	U	11.5	3.57	ug/Kg	1		06/06/17 20:12
1,1-Dichloroethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,1-Dichloroethene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,1-Dichloropropene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,2,3-Trichlorobenzene	28.8	U	57.6	17.3	ug/Kg	1		06/06/17 20:12
1,2,3-Trichloropropane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,2,4-Trichlorobenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,2,4-Trimethylbenzene	178		57.6	17.3	ug/Kg	1		06/06/17 20:12
1,2-Dibromo-3-chloropropane	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
1,2-Dibromoethane	5.75	U	11.5	3.57	ug/Kg	1		06/06/17 20:12
1,2-Dichlorobenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,2-Dichloroethane	5.75	U	11.5	3.57	ug/Kg	1		06/06/17 20:12
1,2-Dichloropropane	5.75	U	11.5	3.57	ug/Kg	1		06/06/17 20:12
1,3,5-Trimethylbenzene	301		28.8	8.98	ug/Kg	1		06/06/17 20:12
1,3-Dichlorobenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
1,3-Dichloropropane	5.75	U	11.5	3.57	ug/Kg	1		06/06/17 20:12
1,4-Dichlorobenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
2,2-Dichloropropane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
2-Butanone (MEK)	144	U	288	89.8	ug/Kg	1		06/06/17 20:12
2-Chlorotoluene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
2-Hexanone	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
4-Chlorotoluene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
4-Isopropyltoluene	267		28.8	8.98	ug/Kg	1		06/06/17 20:12
4-Methyl-2-pentanone (MIBK)	144	U	288	89.8	ug/Kg	1		06/06/17 20:12
Benzene	7.20	U	14.4	4.49	ug/Kg	1		06/06/17 20:12
Bromobenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Bromochloromethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Bromodichloromethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Bromoform	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Bromomethane	115	U	230	71.4	ug/Kg	1		06/06/17 20:12
Carbon disulfide	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
Carbon tetrachloride	7.20	U	14.4	4.49	ug/Kg	1		06/06/17 20:12
Chlorobenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Chloroethane	115	U	230	71.4	ug/Kg	1		06/06/17 20:12

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844009
Lab Project ID: 1172844

Collection Date: 05/31/17 18:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):93.8
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Chloromethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
cis-1,2-Dichloroethene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
cis-1,3-Dichloropropene	7.20	U	14.4	4.49	ug/Kg	1		06/06/17 20:12
Dibromochloromethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Dibromomethane	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Dichlorodifluoromethane	28.8	U	57.6	17.3	ug/Kg	1		06/06/17 20:12
Ethylbenzene	28.8		28.8	8.98	ug/Kg	1		06/06/17 20:12
Freon-113	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
Hexachlorobutadiene	11.5	U	23.0	7.14	ug/Kg	1		06/06/17 20:12
Isopropylbenzene (Cumene)	13.2	J	28.8	8.98	ug/Kg	1		06/06/17 20:12
Methylene chloride	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
Methyl-t-butyl ether	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
Naphthalene	434		28.8	8.98	ug/Kg	1		06/06/17 20:12
n-Butylbenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
n-Propylbenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
o-Xylene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
P & M -Xylene	58.7		57.6	17.3	ug/Kg	1		06/06/17 20:12
sec-Butylbenzene	50.7		28.8	8.98	ug/Kg	1		06/06/17 20:12
Styrene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
tert-Butylbenzene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
Tetrachloroethene	7.48	J	14.4	4.49	ug/Kg	1		06/06/17 20:12
Toluene	21.3	J	28.8	8.98	ug/Kg	1		06/06/17 20:12
trans-1,2-Dichloroethene	14.4	U	28.8	8.98	ug/Kg	1		06/06/17 20:12
trans-1,3-Dichloropropene	7.20	U	14.4	4.49	ug/Kg	1		06/06/17 20:12
Trichloroethene	5.47	J	11.5	3.57	ug/Kg	1		06/06/17 20:12
Trichlorofluoromethane	28.8	U	57.6	17.3	ug/Kg	1		06/06/17 20:12
Vinyl acetate	57.5	U	115	35.7	ug/Kg	1		06/06/17 20:12
Vinyl chloride	5.75	U	11.5	3.57	ug/Kg	1		06/06/17 20:12
Xylenes (total)	58.7	J	86.3	26.2	ug/Kg	1		06/06/17 20:12
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		71-136		%	1		06/06/17 20:12
4-Bromofluorobenzene (surr)	151		55-151		%	1		06/06/17 20:12
Toluene-d8 (surr)	98.3		85-116		%	1		06/06/17 20:12

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844009
Lab Project ID: 1172844

Collection Date: 05/31/17 18:00
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):93.8
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16803
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 20:12
Container ID: 1172844009-B

Prep Batch: VXX30616
Prep Method: SW5035A
Prep Date/Time: 05/31/17 18:00
Prep Initial Wt./Vol.: 52.341 g
Prep Extract Vol: 28.256 mL

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Results of **Trip Blank Soil**

Client Sample ID: **Trip Blank Soil**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844010
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.772	J	2.55	0.764	mg/Kg	1		06/08/17 15:35
Surrogates								
4-Bromofluorobenzene (surr)	88.9		50-150		%	1		06/08/17 15:35

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/08/17 15:35
Container ID: 1172844010-A

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 05/31/17 09:10
Prep Initial Wt./Vol.: 49.089 g
Prep Extract Vol: 25 mL

J flagging is activated

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

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Results of **Trip Blank Soil**

Client Sample ID: **Trip Blank Soil**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844010
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	10.2	U	20.4	6.32	ug/Kg	1		06/06/17 15:10
1,1,1-Trichloroethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,1,2,2-Tetrachloroethane	6.35	U	12.7	3.97	ug/Kg	1		06/06/17 15:10
1,1,2-Trichloroethane	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
1,1-Dichloroethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,1-Dichloroethene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,1-Dichloropropene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,2,3-Trichlorobenzene	25.4	U	50.9	15.3	ug/Kg	1		06/06/17 15:10
1,2,3-Trichloropropane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,2,4-Trichlorobenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,2,4-Trimethylbenzene	25.4	U	50.9	15.3	ug/Kg	1		06/06/17 15:10
1,2-Dibromo-3-chloropropane	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
1,2-Dibromoethane	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
1,2-Dichlorobenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,2-Dichloroethane	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
1,2-Dichloropropane	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
1,3,5-Trimethylbenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,3-Dichlorobenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
1,3-Dichloropropane	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
1,4-Dichlorobenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
2,2-Dichloropropane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
2-Butanone (MEK)	128	U	255	79.4	ug/Kg	1		06/06/17 15:10
2-Chlorotoluene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
2-Hexanone	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
4-Chlorotoluene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
4-Isopropyltoluene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
4-Methyl-2-pentanone (MIBK)	128	U	255	79.4	ug/Kg	1		06/06/17 15:10
Benzene	6.35	U	12.7	3.97	ug/Kg	1		06/06/17 15:10
Bromobenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Bromochloromethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Bromodichloromethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Bromoform	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Bromomethane	102	U	204	63.2	ug/Kg	1		06/06/17 15:10
Carbon disulfide	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
Carbon tetrachloride	6.35	U	12.7	3.97	ug/Kg	1		06/06/17 15:10
Chlorobenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Chloroethane	102	U	204	63.2	ug/Kg	1		06/06/17 15:10

Results of **Trip Blank Soil**

Client Sample ID: **Trip Blank Soil**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844010
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Chloromethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
cis-1,2-Dichloroethene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
cis-1,3-Dichloropropene	6.35	U	12.7	3.97	ug/Kg	1		06/06/17 15:10
Dibromochloromethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Dibromomethane	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Dichlorodifluoromethane	25.4	U	50.9	15.3	ug/Kg	1		06/06/17 15:10
Ethylbenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Freon-113	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
Hexachlorobutadiene	10.2	U	20.4	6.32	ug/Kg	1		06/06/17 15:10
Isopropylbenzene (Cumene)	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Methylene chloride	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
Methyl-t-butyl ether	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
Naphthalene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
n-Butylbenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
n-Propylbenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
o-Xylene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
P & M -Xylene	20.1	J	50.9	15.3	ug/Kg	1		06/06/17 15:10
sec-Butylbenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Styrene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
tert-Butylbenzene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
Tetrachloroethene	6.35	U	12.7	3.97	ug/Kg	1		06/06/17 15:10
Toluene	13.5	J	25.5	7.94	ug/Kg	1		06/06/17 15:10
trans-1,2-Dichloroethene	12.8	U	25.5	7.94	ug/Kg	1		06/06/17 15:10
trans-1,3-Dichloropropene	6.35	U	12.7	3.97	ug/Kg	1		06/06/17 15:10
Trichloroethene	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
Trichlorofluoromethane	25.4	U	50.9	15.3	ug/Kg	1		06/06/17 15:10
Vinyl acetate	51.0	U	102	31.6	ug/Kg	1		06/06/17 15:10
Vinyl chloride	5.10	U	10.2	3.16	ug/Kg	1		06/06/17 15:10
Xylenes (total)	38.2	U	76.4	23.2	ug/Kg	1		06/06/17 15:10
Surrogates								
1,2-Dichloroethane-D4 (surr)	107		71-136		%	1		06/06/17 15:10
4-Bromofluorobenzene (surr)	113		55-151		%	1		06/06/17 15:10
Toluene-d8 (surr)	96.2		85-116		%	1		06/06/17 15:10

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **Trip Blank Soil**

Client Sample ID: **Trip Blank Soil**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844010
Lab Project ID: 1172844

Collection Date: 05/31/17 09:10
Received Date: 06/01/17 09:50
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Analyst: NRO
Analytical Date/Time: 06/06/17 15:10
Container ID: 1172844010-A

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 05/31/17 09:10
Prep Initial Wt./Vol.: 49.089 g
Prep Extract Vol: 25 mL

J flagging is activated

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

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844011
Lab Project ID: 1172844

Collection Date: 05/31/17 20:20
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.306		0.0512	0.0154	ug/L	1		06/03/17 16:30
2-Methylnaphthalene	0.411		0.0512	0.0154	ug/L	1		06/03/17 16:30
Acenaphthene	0.0250 J		0.0512	0.0154	ug/L	1		06/03/17 16:30
Acenaphthylene	0.0256 U		0.0512	0.0154	ug/L	1		06/03/17 16:30
Anthracene	0.0256 U		0.0512	0.0154	ug/L	1		06/03/17 16:30
Benzo(a)Anthracene	0.0229 J		0.0512	0.0154	ug/L	1		06/03/17 16:30
Benzo[a]pyrene	0.0132 J		0.0205	0.00635	ug/L	1		06/03/17 16:30
Benzo[b]Fluoranthene	0.0398 J		0.0512	0.0154	ug/L	1		06/03/17 16:30
Benzo[g,h,i]perylene	0.0207 J		0.0512	0.0154	ug/L	1		06/03/17 16:30
Benzo[k]fluoranthene	0.0256 U		0.0512	0.0154	ug/L	1		06/03/17 16:30
Chrysene	0.0809		0.0512	0.0154	ug/L	1		06/03/17 16:30
Dibenzo[a,h]anthracene	0.0103 U		0.0205	0.00635	ug/L	1		06/03/17 16:30
Fluoranthene	0.0597		0.0512	0.0154	ug/L	1		06/03/17 16:30
Fluorene	0.118		0.0512	0.0154	ug/L	1		06/03/17 16:30
Indeno[1,2,3-c,d] pyrene	0.0256 U		0.0512	0.0154	ug/L	1		06/03/17 16:30
Naphthalene	0.137		0.102	0.0318	ug/L	1		06/03/17 16:30
Phenanthrene	0.315		0.0512	0.0154	ug/L	1		06/03/17 16:30
Pyrene	0.0611		0.0512	0.0154	ug/L	1		06/03/17 16:30
Surrogates								
2-Fluorobiphenyl (surr)	63.1		53-106		%	1		06/03/17 16:30
Terphenyl-d14 (surr)	28.1	*	58-132		%	1		06/03/17 16:30

Batch Information

Analytical Batch: XMS10081
Analytical Method: 8270D SIM LV (PAH)
Analyst: S.G
Analytical Date/Time: 06/03/17 16:30
Container ID: 1172844011-I

Prep Batch: XXX37465
Prep Method: SW3520C
Prep Date/Time: 06/02/17 09:11
Prep Initial Wt./Vol.: 244 mL
Prep Extract Vol: 1 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844011
Lab Project ID: 1172844

Collection Date: 05/31/17 20:20
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.193	J	0.600	0.180	mg/L	1		06/09/17 02:51
Surrogates								
5a Androstane (surr)	64.5		50-150		%	1		06/09/17 02:51

Batch Information

Analytical Batch: XFC13409
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/09/17 02:51
Container ID: 1172844011-G

Prep Batch: XXX37477
Prep Method: SW3520C
Prep Date/Time: 06/05/17 08:25
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844011
Lab Project ID: 1172844

Collection Date: 05/31/17 20:20
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/09/17 18:13
Surrogates								
4-Bromofluorobenzene (surr)	105		50-150		%	1		06/09/17 18:13

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 18:13
Container ID: 1172844011-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

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Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844011
Lab Project ID: 1172844

Collection Date: 05/31/17 20:20
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/07/17 20:28
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/07/17 20:28
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
Benzene	0.200	U	0.400	0.120	ug/L	1		06/07/17 20:28
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Bromodichloromethane	0.319	J	0.500	0.150	ug/L	1		06/07/17 20:28
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/07/17 20:28
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844011
Lab Project ID: 1172844

Collection Date: 05/31/17 20:20
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.664	J	1.00	0.310	ug/L	1		06/07/17 20:28
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:28
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/07/17 20:28
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/07/17 20:28
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Styrene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Toluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:28
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:28
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		06/07/17 20:28
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/07/17 20:28
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		06/07/17 20:28
4-Bromofluorobenzene (surr)	101		85-114		%	1		06/07/17 20:28
Toluene-d8 (surr)	98.6		89-112		%	1		06/07/17 20:28

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-1**

Client Sample ID: **RSE-1**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844011
Lab Project ID: 1172844

Collection Date: 05/31/17 20:20
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16804
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 06/07/17 20:28
Container ID: 1172844011-D

Prep Batch: VXX30617
Prep Method: SW5030B
Prep Date/Time: 06/07/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844012
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.243		0.0517	0.0155	ug/L	1		06/03/17 16:51
2-Methylnaphthalene	0.387		0.0517	0.0155	ug/L	1		06/03/17 16:51
Acenaphthene	0.0176 J		0.0517	0.0155	ug/L	1		06/03/17 16:51
Acenaphthylene	0.0259 U		0.0517	0.0155	ug/L	1		06/03/17 16:51
Anthracene	0.0259 U		0.0517	0.0155	ug/L	1		06/03/17 16:51
Benzo(a)Anthracene	0.0166 J		0.0517	0.0155	ug/L	1		06/03/17 16:51
Benzo[a]pyrene	0.0109 J		0.0207	0.00640	ug/L	1		06/03/17 16:51
Benzo[b]Fluoranthene	0.0274 J		0.0517	0.0155	ug/L	1		06/03/17 16:51
Benzo[g,h,i]perylene	0.0178 J		0.0517	0.0155	ug/L	1		06/03/17 16:51
Benzo[k]fluoranthene	0.0259 U		0.0517	0.0155	ug/L	1		06/03/17 16:51
Chrysene	0.0613		0.0517	0.0155	ug/L	1		06/03/17 16:51
Dibenzo[a,h]anthracene	0.0104 U		0.0207	0.00640	ug/L	1		06/03/17 16:51
Fluoranthene	0.0452 J		0.0517	0.0155	ug/L	1		06/03/17 16:51
Fluorene	0.109		0.0517	0.0155	ug/L	1		06/03/17 16:51
Indeno[1,2,3-c,d] pyrene	0.0259 U		0.0517	0.0155	ug/L	1		06/03/17 16:51
Naphthalene	0.112		0.103	0.0320	ug/L	1		06/03/17 16:51
Phenanthrene	0.305		0.0517	0.0155	ug/L	1		06/03/17 16:51
Pyrene	0.0471 J		0.0517	0.0155	ug/L	1		06/03/17 16:51
Surrogates								
2-Fluorobiphenyl (surr)	84.5		53-106		%	1		06/03/17 16:51
Terphenyl-d14 (surr)	34.2	*	58-132		%	1		06/03/17 16:51

Batch Information

Analytical Batch: XMS10081
Analytical Method: 8270D SIM LV (PAH)
Analyst: S.G
Analytical Date/Time: 06/03/17 16:51
Container ID: 1172844012-I

Prep Batch: XXX37465
Prep Method: SW3520C
Prep Date/Time: 06/02/17 09:11
Prep Initial Wt./Vol.: 242 mL
Prep Extract Vol: 1 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844012
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.318	U	0.636	0.191	mg/L	1		06/09/17 03:01
Surrogates								
5a Androstane (surr)	70		50-150		%	1		06/09/17 03:01

Batch Information

Analytical Batch: XFC13409
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/09/17 03:01
Container ID: 1172844012-G

Prep Batch: XXX37477
Prep Method: SW3520C
Prep Date/Time: 06/05/17 08:25
Prep Initial Wt./Vol.: 236 mL
Prep Extract Vol: 1 mL

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Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844012
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/09/17 18:32
Surrogates								
4-Bromofluorobenzene (surr)	106		50-150		%	1		06/09/17 18:32

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 18:32
Container ID: 1172844012-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844012
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/07/17 20:46
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/07/17 20:46
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
Benzene	0.200	U	0.400	0.120	ug/L	1		06/07/17 20:46
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Bromodichloromethane	0.341	J	0.500	0.150	ug/L	1		06/07/17 20:46
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/07/17 20:46
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46

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J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844012
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.870	J	1.00	0.310	ug/L	1		06/07/17 20:46
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 20:46
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/07/17 20:46
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/07/17 20:46
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Styrene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Toluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 20:46
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/07/17 20:46
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		06/07/17 20:46
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/07/17 20:46
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		06/07/17 20:46
4-Bromofluorobenzene (surr)	102		85-114		%	1		06/07/17 20:46
Toluene-d8 (surr)	99.1		89-112		%	1		06/07/17 20:46

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J flagging is activated

Results of **RSE-2**

Client Sample ID: **RSE-2**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844012
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16804
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 06/07/17 20:46
Container ID: 1172844012-D

Prep Batch: VXX30617
Prep Method: SW5030B
Prep Date/Time: 06/07/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844013
Lab Project ID: 1172844

Collection Date: 05/31/17 17:40
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
2-Methylnaphthalene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Acenaphthene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Acenaphthylene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Anthracene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Benzo(a)Anthracene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Benzo[a]pyrene	0.0101	U	0.0202	0.00625	ug/L	1		06/03/17 17:12
Benzo[b]Fluoranthene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Benzo[g,h,i]perylene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Benzo[k]fluoranthene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Chrysene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Dibenzo[a,h]anthracene	0.0101	U	0.0202	0.00625	ug/L	1		06/03/17 17:12
Fluoranthene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Fluorene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Indeno[1,2,3-c,d] pyrene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Naphthalene	0.0505	U	0.101	0.0313	ug/L	1		06/03/17 17:12
Phenanthrene	0.0163	J	0.0504	0.0151	ug/L	1		06/03/17 17:12
Pyrene	0.0252	U	0.0504	0.0151	ug/L	1		06/03/17 17:12
Surrogates								
2-Fluorobiphenyl (surr)	91.2		53-106		%	1		06/03/17 17:12
Terphenyl-d14 (surr)	89.4		58-132		%	1		06/03/17 17:12

Batch Information

Analytical Batch: XMS10081
Analytical Method: 8270D SIM LV (PAH)
Analyst: S.G
Analytical Date/Time: 06/03/17 17:12
Container ID: 1172844013-I

Prep Batch: XXX37465
Prep Method: SW3520C
Prep Date/Time: 06/02/17 09:11
Prep Initial Wt./Vol.: 248 mL
Prep Extract Vol: 1 mL

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Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844013
Lab Project ID: 1172844

Collection Date: 05/31/17 17:40
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.294	U	0.588	0.176	mg/L	1		06/09/17 03:11
Surrogates								
5a Androstane (surr)	81.6		50-150		%	1		06/09/17 03:11

Batch Information

Analytical Batch: XFC13409
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/09/17 03:11
Container ID: 1172844013-G

Prep Batch: XXX37477
Prep Method: SW3520C
Prep Date/Time: 06/05/17 08:25
Prep Initial Wt./Vol.: 255 mL
Prep Extract Vol: 1 mL

Print Date: 06/15/2017 5:49:29PM

J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844013
Lab Project ID: 1172844

Collection Date: 05/31/17 17:40
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/09/17 19:28
Surrogates								
4-Bromofluorobenzene (surr)	106		50-150		%	1		06/09/17 19:28

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 19:28
Container ID: 1172844013-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

J flagging is activated

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Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844013
Lab Project ID: 1172844

Collection Date: 05/31/17 17:40
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/07/17 21:03
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/07/17 21:03
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
Benzene	0.200	U	0.400	0.120	ug/L	1		06/07/17 21:03
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Bromodichloromethane	0.307	J	0.500	0.150	ug/L	1		06/07/17 21:03
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/07/17 21:03
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03

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Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844013
Lab Project ID: 1172844

Collection Date: 05/31/17 17:40
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.600	J	1.00	0.310	ug/L	1		06/07/17 21:03
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:03
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/07/17 21:03
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/07/17 21:03
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Styrene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Toluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:03
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:03
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		06/07/17 21:03
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/07/17 21:03
Surrogates								
1,2-Dichloroethane-D4 (surr)	106		81-118		%	1		06/07/17 21:03
4-Bromofluorobenzene (surr)	102		85-114		%	1		06/07/17 21:03
Toluene-d8 (surr)	98.1		89-112		%	1		06/07/17 21:03

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J flagging is activated

Results of **RSE-3**

Client Sample ID: **RSE-3**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844013
Lab Project ID: 1172844

Collection Date: 05/31/17 17:40
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16804
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 06/07/17 21:03
Container ID: 1172844013-D

Prep Batch: VXX30617
Prep Method: SW5030B
Prep Date/Time: 06/07/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844014
Lab Project ID: 1172844

Collection Date: 05/31/17 19:00
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	0.174		0.0463	0.0139	ug/L	1		06/03/17 17:32
2-Methylnaphthalene	0.258		0.0463	0.0139	ug/L	1		06/03/17 17:32
Acenaphthene	0.0232 U		0.0463	0.0139	ug/L	1		06/03/17 17:32
Acenaphthylene	0.0232 U		0.0463	0.0139	ug/L	1		06/03/17 17:32
Anthracene	0.0232 U		0.0463	0.0139	ug/L	1		06/03/17 17:32
Benzo(a)Anthracene	0.0139 J		0.0463	0.0139	ug/L	1		06/03/17 17:32
Benzo[a]pyrene	0.00804 J		0.0185	0.00574	ug/L	1		06/03/17 17:32
Benzo[b]Fluoranthene	0.0245 J		0.0463	0.0139	ug/L	1		06/03/17 17:32
Benzo[g,h,i]perylene	0.0140 J		0.0463	0.0139	ug/L	1		06/03/17 17:32
Benzo[k]fluoranthene	0.0232 U		0.0463	0.0139	ug/L	1		06/03/17 17:32
Chrysene	0.0482		0.0463	0.0139	ug/L	1		06/03/17 17:32
Dibenzo[a,h]anthracene	0.00925 U		0.0185	0.00574	ug/L	1		06/03/17 17:32
Fluoranthene	0.0344 J		0.0463	0.0139	ug/L	1		06/03/17 17:32
Fluorene	0.0781		0.0463	0.0139	ug/L	1		06/03/17 17:32
Indeno[1,2,3-c,d] pyrene	0.0232 U		0.0463	0.0139	ug/L	1		06/03/17 17:32
Naphthalene	0.0835 J		0.0926	0.0287	ug/L	1		06/03/17 17:32
Phenanthrene	0.224		0.0463	0.0139	ug/L	1		06/03/17 17:32
Pyrene	0.0392 J		0.0463	0.0139	ug/L	1		06/03/17 17:32
Surrogates								
2-Fluorobiphenyl (surr)	74.5		53-106		%	1		06/03/17 17:32
Terphenyl-d14 (surr)	28.8	*	58-132		%	1		06/03/17 17:32

Batch Information

Analytical Batch: XMS10081
Analytical Method: 8270D SIM LV (PAH)
Analyst: S.G
Analytical Date/Time: 06/03/17 17:32
Container ID: 1172844014-I

Prep Batch: XXX37465
Prep Method: SW3520C
Prep Date/Time: 06/02/17 09:11
Prep Initial Wt./Vol.: 270 mL
Prep Extract Vol: 1 mL

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J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844014
Lab Project ID: 1172844

Collection Date: 05/31/17 19:00
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.305	U	0.610	0.183	mg/L	1		06/09/17 03:20
Surrogates								
5a Androstane (surr)	74.3		50-150		%	1		06/09/17 03:20

Batch Information

Analytical Batch: XFC13409
Analytical Method: AK102
Analyst: KMD
Analytical Date/Time: 06/09/17 03:20
Container ID: 1172844014-G

Prep Batch: XXX37477
Prep Method: SW3520C
Prep Date/Time: 06/05/17 08:25
Prep Initial Wt./Vol.: 246 mL
Prep Extract Vol: 1 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844014
Lab Project ID: 1172844

Collection Date: 05/31/17 19:00
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/09/17 19:47
Surrogates								
4-Bromofluorobenzene (surr)	105		50-150		%	1		06/09/17 19:47

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 19:47
Container ID: 1172844014-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844014
Lab Project ID: 1172844

Collection Date: 05/31/17 19:00
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
1,1,1-Trichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,1,2,2-Tetrachloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
1,1,2-Trichloroethane	0.200	U	0.400	0.120	ug/L	1		06/07/17 21:21
1,1-Dichloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,1-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,1-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,2,3-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,2,3-Trichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,2,4-Trichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,2,4-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,2-Dibromo-3-chloropropane	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
1,2-Dibromoethane	0.0375	U	0.0750	0.0180	ug/L	1		06/07/17 21:21
1,2-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,2-Dichloroethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
1,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,3,5-Trimethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,3-Dichlorobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
1,3-Dichloropropane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
1,4-Dichlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
2,2-Dichloropropane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
2-Butanone (MEK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
2-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
2-Hexanone	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
4-Chlorotoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
4-Isopropyltoluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
4-Methyl-2-pentanone (MIBK)	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
Benzene	0.200	U	0.400	0.120	ug/L	1		06/07/17 21:21
Bromobenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Bromochloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Bromodichloromethane	0.334	J	0.500	0.150	ug/L	1		06/07/17 21:21
Bromoform	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Bromomethane	2.50	U	5.00	1.50	ug/L	1		06/07/17 21:21
Carbon disulfide	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
Carbon tetrachloride	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Chlorobenzene	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
Chloroethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21

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Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844014
Lab Project ID: 1172844

Collection Date: 05/31/17 19:00
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.711	J	1.00	0.310	ug/L	1		06/07/17 21:21
Chloromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
cis-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
cis-1,3-Dichloropropene	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
Dibromochloromethane	0.250	U	0.500	0.150	ug/L	1		06/07/17 21:21
Dibromomethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Dichlorodifluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Ethylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Freon-113	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
Hexachlorobutadiene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Isopropylbenzene (Cumene)	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Methylene chloride	2.50	U	5.00	1.00	ug/L	1		06/07/17 21:21
Methyl-t-butyl ether	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
Naphthalene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
n-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
n-Propylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
o-Xylene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
P & M -Xylene	1.00	U	2.00	0.620	ug/L	1		06/07/17 21:21
sec-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Styrene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
tert-Butylbenzene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Tetrachloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Toluene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
trans-1,2-Dichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
trans-1,3-Dichloropropene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Trichloroethene	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Trichlorofluoromethane	0.500	U	1.00	0.310	ug/L	1		06/07/17 21:21
Vinyl acetate	5.00	U	10.0	3.10	ug/L	1		06/07/17 21:21
Vinyl chloride	0.0750	U	0.150	0.0500	ug/L	1		06/07/17 21:21
Xylenes (total)	1.50	U	3.00	1.00	ug/L	1		06/07/17 21:21
Surrogates								
1,2-Dichloroethane-D4 (surr)	109		81-118		%	1		06/07/17 21:21
4-Bromofluorobenzene (surr)	103		85-114		%	1		06/07/17 21:21
Toluene-d8 (surr)	98.7		89-112		%	1		06/07/17 21:21

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J flagging is activated

Results of **RSE-X**

Client Sample ID: **RSE-X**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844014
Lab Project ID: 1172844

Collection Date: 05/31/17 19:00
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16804
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 06/07/17 21:21
Container ID: 1172844014-D

Prep Batch: VXX30617
Prep Method: SW5030B
Prep Date/Time: 06/07/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **H2O Trip Blank**

Client Sample ID: **H2O Trip Blank**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844015
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.0500	U	0.100	0.0310	mg/L	1		06/09/17 13:14
Surrogates								
4-Bromofluorobenzene (surr)	105		50-150		%	1		06/09/17 13:14

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 06/09/17 13:14
Container ID: 1172844015-A

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 06/09/17 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:49:29PM

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Results of **H2O Trip Blank**

Client Sample ID: **H2O Trip Blank**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844015
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1,1,1,2-Tetrachloroethane	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
1,1,1-Trichloroethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,1,2,2-Tetrachloroethane	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
1,1,2-Trichloroethane	0.200 U		0.400	0.120	ug/L	1		06/07/17 19:01
1,1-Dichloroethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,1-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,1-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,2,3-Trichlorobenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,2,3-Trichloropropane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,2,4-Trichlorobenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,2,4-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,2-Dibromo-3-chloropropane	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
1,2-Dibromoethane	0.0375 U		0.0750	0.0180	ug/L	1		06/07/17 19:01
1,2-Dichlorobenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,2-Dichloroethane	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
1,2-Dichloropropane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,3,5-Trimethylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,3-Dichlorobenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
1,3-Dichloropropane	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
1,4-Dichlorobenzene	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
2,2-Dichloropropane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
2-Butanone (MEK)	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
2-Chlorotoluene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
2-Hexanone	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
4-Chlorotoluene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
4-Isopropyltoluene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
4-Methyl-2-pentanone (MIBK)	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
Benzene	0.200 U		0.400	0.120	ug/L	1		06/07/17 19:01
Bromobenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Bromochloromethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Bromodichloromethane	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
Bromoform	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Bromomethane	2.50 U		5.00	1.50	ug/L	1		06/07/17 19:01
Carbon disulfide	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
Carbon tetrachloride	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Chlorobenzene	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
Chloroethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01

Print Date: 06/15/2017 5:49:29PM

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Results of **H2O Trip Blank**

Client Sample ID: **H2O Trip Blank**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844015
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Chloroform	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Chloromethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
cis-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
cis-1,3-Dichloropropene	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
Dibromochloromethane	0.250 U		0.500	0.150	ug/L	1		06/07/17 19:01
Dibromomethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Dichlorodifluoromethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Ethylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Freon-113	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
Hexachlorobutadiene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Isopropylbenzene (Cumene)	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Methylene chloride	2.50 U		5.00	1.00	ug/L	1		06/07/17 19:01
Methyl-t-butyl ether	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
Naphthalene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
n-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
n-Propylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
o-Xylene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
P & M -Xylene	1.00 U		2.00	0.620	ug/L	1		06/07/17 19:01
sec-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Styrene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
tert-Butylbenzene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Tetrachloroethene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Toluene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
trans-1,2-Dichloroethene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
trans-1,3-Dichloropropene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Trichloroethene	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Trichlorofluoromethane	0.500 U		1.00	0.310	ug/L	1		06/07/17 19:01
Vinyl acetate	5.00 U		10.0	3.10	ug/L	1		06/07/17 19:01
Vinyl chloride	0.0750 U		0.150	0.0500	ug/L	1		06/07/17 19:01
Xylenes (total)	1.50 U		3.00	1.00	ug/L	1		06/07/17 19:01
Surrogates								
1,2-Dichloroethane-D4 (surr)	105		81-118		%	1		06/07/17 19:01
4-Bromofluorobenzene (surr)	101		85-114		%	1		06/07/17 19:01
Toluene-d8 (surr)	98.4		89-112		%	1		06/07/17 19:01

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Results of **H2O Trip Blank**

Client Sample ID: **H2O Trip Blank**
Client Project ID: **RAVN Site Investigation**
Lab Sample ID: 1172844015
Lab Project ID: 1172844

Collection Date: 05/31/17 16:45
Received Date: 06/01/17 09:50
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile GC/MS**

Batch Information

Analytical Batch: VMS16804
Analytical Method: SW8260C
Analyst: NRB
Analytical Date/Time: 06/07/17 19:01
Container ID: 1172844015-D

Prep Batch: VXX30617
Prep Method: SW5030B
Prep Date/Time: 06/07/17 06:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1760087 [SPT/10172]
Blank Lab ID: 1387964

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844009

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT10172
Analytical Method: SM21 2540G
Instrument:
Analyst: NIC
Analytical Date/Time: 6/1/2017 4:56:00PM

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Duplicate Sample Summary

Original Sample ID: 1172789021
Duplicate Sample ID: 1387966
QC for Samples:

Analysis Date: 06/01/2017 16:56
Matrix: Soil/Solid (dry weight)

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	93.2	92.9	%	0.28	(< 15)

Batch Information

Analytical Batch: SPT10172
Analytical Method: SM21 2540G
Instrument:
Analyst: NIC

Print Date: 06/15/2017 5:49:37PM

Duplicate Sample Summary

Original Sample ID: 1172842001
Duplicate Sample ID: 1387967

Analysis Date: 06/01/2017 16:56
Matrix: Soil/Solid (dry weight)

QC for Samples:

1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844009

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	91.7	92.6	%	0.96	(< 15)

Batch Information

Analytical Batch: SPT10172
Analytical Method: SM21 2540G
Instrument:
Analyst: NIC

Print Date: 06/15/2017 5:49:37PM

Method Blank

Blank ID: MB for HBN 1760563 [VXX/30615]
Blank Lab ID: 1389229

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

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

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Method Blank

Blank ID: MB for HBN 1760563 [VXX/30615]
Blank Lab ID: 1389229

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	10.0U	20.0	6.20	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Trichloroethene	4.75J	10.0	3.10	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	109	71-136		%
4-Bromofluorobenzene (surr)	89.8	55-151		%
Toluene-d8 (surr)	95.9	85-116		%

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Method Blank

Blank ID: MB for HBN 1760563 [VXX/30615]
Blank Lab ID: 1389229

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: NRO
Analytical Date/Time: 6/6/2017 12:28:00PM

Prep Batch: VXX30615
Prep Method: SW5035A
Prep Date/Time: 6/6/2017 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30615]
Blank Spike Lab ID: 1389230
Date Analyzed: 06/06/2017 12:44

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	767	102	(78-125)
1,1,1-Trichloroethane	750	744	99	(73-130)
1,1,2,2-Tetrachloroethane	750	741	99	(70-124)
1,1,2-Trichloroethane	750	748	100	(78-121)
1,1-Dichloroethane	750	705	94	(76-125)
1,1-Dichloroethene	750	737	98	(70-131)
1,1-Dichloropropene	750	742	99	(76-125)
1,2,3-Trichlorobenzene	750	693	92	(66-130)
1,2,3-Trichloropropane	750	726	97	(73-125)
1,2,4-Trichlorobenzene	750	706	94	(67-129)
1,2,4-Trimethylbenzene	750	723	96	(75-123)
1,2-Dibromo-3-chloropropane	750	810	108	(61-132)
1,2-Dibromoethane	750	764	102	(78-122)
1,2-Dichlorobenzene	750	708	94	(78-121)
1,2-Dichloroethane	750	744	99	(73-128)
1,2-Dichloropropane	750	735	98	(76-123)
1,3,5-Trimethylbenzene	750	728	97	(73-124)
1,3-Dichlorobenzene	750	696	93	(77-121)
1,3-Dichloropropane	750	744	99	(77-121)
1,4-Dichlorobenzene	750	695	93	(75-120)
2,2-Dichloropropane	750	741	99	(67-133)
2-Butanone (MEK)	2250	2370	105	(51-148)
2-Chlorotoluene	750	716	95	(75-122)
2-Hexanone	2250	2240	99	(53-145)
4-Chlorotoluene	750	719	96	(72-124)
4-Isopropyltoluene	750	731	98	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2270	101	(65-135)
Benzene	750	717	96	(77-121)
Bromobenzene	750	699	93	(78-121)
Bromochloromethane	750	692	92	(78-125)
Bromodichloromethane	750	770	103	(75-127)
Bromoform	750	788	105	(67-132)
Bromomethane	750	792	106	(53-143)
Carbon disulfide	1130	1100	98	(63-132)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30615]
Blank Spike Lab ID: 1389230
Date Analyzed: 06/06/2017 12:44

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon tetrachloride	750	776	103	(70-135)
Chlorobenzene	750	707	94	(79-120)
Chloroethane	750	817	109	(59-139)
Chloroform	750	702	94	(78-123)
Chloromethane	750	851	114	(50-136)
cis-1,2-Dichloroethene	750	693	92	(77-123)
cis-1,3-Dichloropropene	750	785	105	(74-126)
Dibromochloromethane	750	774	103	(74-126)
Dibromomethane	750	719	96	(78-125)
Dichlorodifluoromethane	750	740	99	(29-149)
Ethylbenzene	750	717	96	(76-122)
Freon-113	1130	1100	98	(66-136)
Hexachlorobutadiene	750	749	100	(61-135)
Isopropylbenzene (Cumene)	750	713	95	(68-134)
Methylene chloride	750	760	101	(70-128)
Methyl-t-butyl ether	1130	1100	98	(73-125)
Naphthalene	750	687	92	(62-129)
n-Butylbenzene	750	743	99	(70-128)
n-Propylbenzene	750	735	98	(73-125)
o-Xylene	750	717	96	(77-123)
P & M -Xylene	1500	1440	96	(77-124)
sec-Butylbenzene	750	733	98	(73-126)
Styrene	750	729	97	(76-124)
tert-Butylbenzene	750	728	97	(73-125)
Tetrachloroethene	750	747	100	(73-128)
Toluene	750	693	92	(77-121)
trans-1,2-Dichloroethene	750	707	94	(74-125)
trans-1,3-Dichloropropene	750	804	107	(71-130)
Trichloroethene	750	734	98	(77-123)
Trichlorofluoromethane	750	788	105	(62-140)
Vinyl acetate	750	841	112	(50-151)
Vinyl chloride	750	737	98	(56-135)
Xylenes (total)	2250	2150	96	(78-124)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30615]
Blank Spike Lab ID: 1389230
Date Analyzed: 06/06/2017 12:44

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

Parameter	Blank Spike (%) Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	95.1	95	(71-136)
4-Bromofluorobenzene (surr)	750	90.5	91	(55-151)
Toluene-d8 (surr)	750	100	100	(85-116)

Batch Information

Analytical Batch: **VMS16802**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **NRO**

Prep Batch: **VXX30615**
Prep Method: **SW5035A**
Prep Date/Time: **06/06/2017 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1172911003
MS Sample ID: 1389231 MS
MSD Sample ID: 1389232 MSD

Analysis Date: 06/06/2017 16:31
Analysis Date: 06/06/2017 14:05
Analysis Date: 06/06/2017 14:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	4.14U	212	201	95	212	212	100	78-125	5.10	(< 20)
1,1,1-Trichloroethane	5.20U	212	223	105	212	207	97	73-130	7.60	(< 20)
1,1,2,2-Tetrachloroethane	2.59U	212	207	98	212	203	95	70-124	2.10	(< 20)
1,1,2-Trichloroethane	2.07U	212	203	95	212	212	100	78-121	4.60	(< 20)
1,1-Dichloroethane	5.20U	212	220	103	212	203	96	76-125	7.90	(< 20)
1,1-Dichloroethene	5.20U	212	232	109	212	180	85	70-131	25.20	* (< 20)
1,1-Dichloropropene	5.20U	212	214	101	212	206	97	76-125	3.90	(< 20)
1,2,3-Trichlorobenzene	10.4U	212	151	72	212	196	92	66-130	25.20	* (< 20)
1,2,3-Trichloropropane	5.20U	212	200	94	212	196	92	73-125	2.30	(< 20)
1,2,4-Trichlorobenzene	5.20U	212	168	79	212	192	90	67-129	12.90	(< 20)
1,2,4-Trimethylbenzene	80.1	212	248	79	212	244	77	75-123	1.50	(< 20)
1,2-Dibromo-3-chloropropane	20.7U	212	205	96	212	229	108	61-132	11.30	(< 20)
1,2-Dibromoethane	2.07U	212	203	96	212	213	101	78-122	5.20	(< 20)
1,2-Dichlorobenzene	5.20U	212	198	93	212	193	91	78-121	2.90	(< 20)
1,2-Dichloroethane	2.07U	212	231	109	212	216	102	73-128	6.90	(< 20)
1,2-Dichloropropane	2.07U	212	220	104	212	213	101	76-123	3.10	(< 20)
1,3,5-Trimethylbenzene	20.4	212	214	92	212	211	90	73-124	1.90	(< 20)
1,3-Dichlorobenzene	5.20U	212	194	91	212	190	89	77-121	2.20	(< 20)
1,3-Dichloropropane	2.07U	212	200	95	212	210	99	77-121	4.40	(< 20)
1,4-Dichlorobenzene	5.20U	212	199	94	212	195	92	75-120	2.20	(< 20)
2,2-Dichloropropane	5.20U	212	222	104	212	205	96	67-133	8.00	(< 20)
2-Butanone (MEK)	52.0U	636	596	94	636	654	103	51-148	9.20	(< 20)
2-Chlorotoluene	5.20U	212	207	98	212	201	95	75-122	2.70	(< 20)
2-Hexanone	20.7U	636	603	95	636	633	100	53-145	4.90	(< 20)
4-Chlorotoluene	5.20U	212	198	94	212	195	92	72-124	1.70	(< 20)
4-Isopropyltoluene	5.20U	212	198	94	212	197	93	73-127	0.68	(< 20)
4-Methyl-2-pentanone (MIBK)	52.0U	636	645	101	636	631	99	65-135	2.20	(< 20)
Benzene	3.11J	212	207	96	212	206	96	77-121	0.82	(< 20)
Bromobenzene	5.20U	212	201	95	212	194	92	78-121	3.80	(< 20)
Bromochloromethane	5.20U	212	228	108	212	201	95	78-125	12.30	(< 20)
Bromodichloromethane	5.20U	212	240	113	212	223	105	75-127	7.60	(< 20)
Bromoform	5.20U	212	209	99	212	212	100	67-132	1.60	(< 20)
Bromomethane	41.4U	212	267	126	212	186	88	53-143	35.60	* (< 20)
Carbon disulfide	20.7U	318	361	114	318	276	87	63-132	27.00	* (< 20)
Carbon tetrachloride	2.59U	212	232	109	212	213	101	70-135	8.50	(< 20)
Chlorobenzene	5.20U	212	198	94	212	199	94	79-120	0.64	(< 20)
Chloroethane	41.4U	212	274	129	212	191	90	59-139	35.90	* (< 20)

Print Date: 06/15/2017 5:49:45PM

Matrix Spike Summary

Original Sample ID: 1172911003
MS Sample ID: 1389231 MS
MSD Sample ID: 1389232 MSD

Analysis Date: 06/06/2017 16:31
Analysis Date: 06/06/2017 14:05
Analysis Date: 06/06/2017 14:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

		Matrix Spike (ug/Kg)				Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)		Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	5.20U	212	220	103		212	205	96	78-123	7.10	(< 20)
Chloromethane	5.20U	212	251	118		212	196	93	50-136	24.10 *	(< 20)
cis-1,2-Dichloroethene	5.20U	212	216	102		212	203	96	77-123	6.20	(< 20)
cis-1,3-Dichloropropene	2.59U	212	231	109		212	222	105	74-126	4.00	(< 20)
Dibromochloromethane	5.20U	212	209	98		212	212	100	74-126	1.50	(< 20)
Dibromomethane	5.20U	212	225	106		212	208	98	78-125	8.00	(< 20)
Dichlorodifluoromethane	10.4U	212	224	105		212	183	87	29-149	19.50	(< 20)
Ethylbenzene	15.2	212	210	92		212	212	93	76-122	0.94	(< 20)
Freon-113	20.7U	318	340	107		318	275	86	66-136	21.20 *	(< 20)
Hexachlorobutadiene	4.14U	212	162	77		212	172	81	61-135	5.50	(< 20)
Isopropylbenzene (Cumene)	5.20U	212	203	95		212	205	97	68-134	1.30	(< 20)
Methylene chloride	20.7U	212	247	117		212	226	106	70-128	9.20	(< 20)
Methyl-t-butyl ether	20.7U	318	332	104		318	320	100	73-125	3.70	(< 20)
Naphthalene	12.8	212	166	72		212	206	91	62-129	21.20 *	(< 20)
n-Butylbenzene	5.20U	212	194	91		212	192	90	70-128	1.20	(< 20)
n-Propylbenzene	7.35J	212	208	95		212	200	91	73-125	3.80	(< 20)
o-Xylene	35.6	212	224	89		212	228	91	77-123	1.50	(< 20)
P & M -Xylene	51.7	424	437	91		424	443	92	77-124	1.50	(< 20)
sec-Butylbenzene	5.20U	212	197	93		212	191	90	73-126	3.30	(< 20)
Styrene	5.20U	212	209	99		212	209	99	76-124	0.17	(< 20)
tert-Butylbenzene	5.20U	212	197	93		212	196	93	73-125	0.57	(< 20)
Tetrachloroethene	2.59U	212	191	90		212	199	94	73-128	4.10	(< 20)
Toluene	17.9	212	199	85		212	203	87	77-121	1.80	(< 20)
trans-1,2-Dichloroethene	5.20U	212	220	104		212	200	94	74-125	9.30	(< 20)
trans-1,3-Dichloropropene	2.59U	212	217	103		212	225	106	71-130	3.20	(< 20)
Trichloroethene	2.07U	212	211	99		212	206	97	77-123	2.50	(< 20)
Trichlorofluoromethane	129	212	434	144 *		212	223	44 *	62-140	64.30 *	(< 20)
Vinyl acetate	20.7U	212	239	113		212	231	109	50-151	3.10	(< 20)
Vinyl chloride	2.07U	212	230	108		212	176	83	56-135	27.00 *	(< 20)
Xylenes (total)	87.3	636	661	90		636	672	92	78-124	1.50	(< 20)
Surrogates											
1,2-Dichloroethane-D4 (surr)		212	225	106		212	211	99	71-136	6.60	
4-Bromofluorobenzene (surr)		354	248	70		354	240	68	55-151	3.80	
Toluene-d8 (surr)		212	205	97		212	206	97	85-116	0.34	

Print Date: 06/15/2017 5:49:45PM

Matrix Spike Summary

Original Sample ID: 1172911003
MS Sample ID: 1389231 MS
MSD Sample ID: 1389232 MSD

Analysis Date:
Analysis Date: 06/06/2017 14:05
Analysis Date: 06/06/2017 14:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844010

Results by **SW8260C**

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

Batch Information

Analytical Batch: VMS16802
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: NRO
Analytical Date/Time: 6/6/2017 2:05:00PM

Prep Batch: VXX30615
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 6/6/2017 6:00:00AM
Prep Initial Wt./Vol.: 188.45g
Prep Extract Vol: 25.00mL

Print Date: 06/15/2017 5:49:45PM

Method Blank

Blank ID: MB for HBN 1760565 [VXX/30616]
Blank Lab ID: 1389235

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844009

Results by **SW8260C**

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

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Method Blank

Blank ID: MB for HBN 1760565 [VXX/30616]
Blank Lab ID: 1389235

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	12.5U	25.0	7.80	ug/Kg
cis-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
cis-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Dibromomethane	12.5U	25.0	7.80	ug/Kg
Dichlorodifluoromethane	25.0U	50.0	15.0	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Freon-113	50.0U	100	31.0	ug/Kg
Hexachlorobutadiene	10.0U	20.0	6.20	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
Methylene chloride	50.0U	100	31.0	ug/Kg
Methyl-t-butyl ether	50.0U	100	31.0	ug/Kg
Naphthalene	12.5U	25.0	7.80	ug/Kg
n-Butylbenzene	12.5U	25.0	7.80	ug/Kg
n-Propylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
sec-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
tert-Butylbenzene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,2-Dichloroethene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Trichloroethene	4.75J	10.0	3.10	ug/Kg
Trichlorofluoromethane	25.0U	50.0	15.0	ug/Kg
Vinyl acetate	50.0U	100	31.0	ug/Kg
Vinyl chloride	5.00U	10.0	3.10	ug/Kg
Xylenes (total)	37.5U	75.0	22.8	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	105	71-136		%
4-Bromofluorobenzene (surr)	96.1	55-151		%
Toluene-d8 (surr)	97.5	85-116		%

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Method Blank

Blank ID: MB for HBN 1760565 [VXX/30616]
Blank Lab ID: 1389235

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844009

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS16803
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: NRO
Analytical Date/Time: 6/6/2017 12:33:00PM

Prep Batch: VXX30616
Prep Method: SW5035A
Prep Date/Time: 6/6/2017 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30616]
Blank Spike Lab ID: 1389236
Date Analyzed: 06/06/2017 12:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	794	106	(78-125)
1,1,1-Trichloroethane	750	750	100	(73-130)
1,1,2,2-Tetrachloroethane	750	804	107	(70-124)
1,1,2-Trichloroethane	750	789	105	(78-121)
1,1-Dichloroethane	750	713	95	(76-125)
1,1-Dichloroethene	750	730	97	(70-131)
1,1-Dichloropropene	750	762	102	(76-125)
1,2,3-Trichlorobenzene	750	791	105	(66-130)
1,2,3-Trichloropropane	750	804	107	(73-125)
1,2,4-Trichlorobenzene	750	779	104	(67-129)
1,2,4-Trimethylbenzene	750	785	105	(75-123)
1,2-Dibromo-3-chloropropane	750	786	105	(61-132)
1,2-Dibromoethane	750	789	105	(78-122)
1,2-Dichlorobenzene	750	765	102	(78-121)
1,2-Dichloroethane	750	705	94	(73-128)
1,2-Dichloropropane	750	760	101	(76-123)
1,3,5-Trimethylbenzene	750	790	105	(73-124)
1,3-Dichlorobenzene	750	754	101	(77-121)
1,3-Dichloropropane	750	790	105	(77-121)
1,4-Dichlorobenzene	750	767	102	(75-120)
2,2-Dichloropropane	750	777	104	(67-133)
2-Butanone (MEK)	2250	2310	103	(51-148)
2-Chlorotoluene	750	759	101	(75-122)
2-Hexanone	2250	2400	107	(53-145)
4-Chlorotoluene	750	769	103	(72-124)
4-Isopropyltoluene	750	805	107	(73-127)
4-Methyl-2-pentanone (MIBK)	2250	2300	102	(65-135)
Benzene	750	756	101	(77-121)
Bromobenzene	750	768	102	(78-121)
Bromochloromethane	750	745	99	(78-125)
Bromodichloromethane	750	755	101	(75-127)
Bromoform	750	799	106	(67-132)
Bromomethane	750	795	106	(53-143)
Carbon disulfide	1130	1070	95	(63-132)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30616]
Blank Spike Lab ID: 1389236
Date Analyzed: 06/06/2017 12:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844009

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
Carbon tetrachloride	750	756	101	(70-135)
Chlorobenzene	750	760	101	(79-120)
Chloroethane	750	742	99	(59-139)
Chloroform	750	724	97	(78-123)
Chloromethane	750	597	80	(50-136)
cis-1,2-Dichloroethene	750	722	96	(77-123)
cis-1,3-Dichloropropene	750	797	106	(74-126)
Dibromochloromethane	750	791	105	(74-126)
Dibromomethane	750	760	101	(78-125)
Dichlorodifluoromethane	750	737	98	(29-149)
Ethylbenzene	750	766	102	(76-122)
Freon-113	1130	1110	99	(66-136)
Hexachlorobutadiene	750	776	103	(61-135)
Isopropylbenzene (Cumene)	750	770	103	(68-134)
Methylene chloride	750	771	103	(70-128)
Methyl-t-butyl ether	1130	1160	103	(73-125)
Naphthalene	750	813	108	(62-129)
n-Butylbenzene	750	792	106	(70-128)
n-Propylbenzene	750	783	104	(73-125)
o-Xylene	750	762	102	(77-123)
P & M -Xylene	1500	1520	101	(77-124)
sec-Butylbenzene	750	791	106	(73-126)
Styrene	750	760	101	(76-124)
tert-Butylbenzene	750	787	105	(73-125)
Tetrachloroethene	750	782	104	(73-128)
Toluene	750	766	102	(77-121)
trans-1,2-Dichloroethene	750	734	98	(74-125)
trans-1,3-Dichloropropene	750	817	109	(71-130)
Trichloroethene	750	754	101	(77-123)
Trichlorofluoromethane	750	731	97	(62-140)
Vinyl acetate	750	742	99	(50-151)
Vinyl chloride	750	742	99	(56-135)
Xylenes (total)	2250	2280	101	(78-124)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30616]
Blank Spike Lab ID: 1389236
Date Analyzed: 06/06/2017 12:49

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844009

Results by **SW8260C**

Parameter	Blank Spike (%) Spike	Result	Rec (%)	CL
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	96.7	97	(71-136)
4-Bromofluorobenzene (surr)	750	95.5	96	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS16803**
Analytical Method: **SW8260C**
Instrument: **VQA 7890/5975 GC/MS**
Analyst: **NRO**

Prep Batch: **VXX30616**
Prep Method: **SW5035A**
Prep Date/Time: **06/06/2017 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1172890004
MS Sample ID: 1389237 MS
MSD Sample ID: 1389238 MSD

Analysis Date: 06/06/2017 19:08
Analysis Date: 06/06/2017 14:03
Analysis Date: 06/06/2017 14:19
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844009

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	73.0U	3583	3673	103	3583	3923	109	78-125	6.40	(< 20)
1,1,1-Trichloroethane	91.5U	3583	3469	97	3583	3673	103	73-130	5.80	(< 20)
1,1,2,2-Tetrachloroethane	45.7U	3583	3741	104	3583	3991	112	70-124	6.90	(< 20)
1,1,2-Trichloroethane	36.5U	3583	3605	101	3583	3878	109	78-121	7.70	(< 20)
1,1-Dichloroethane	91.5U	3583	3243	90	3583	3515	98	76-125	8.20	(< 20)
1,1-Dichloroethene	91.5U	3583	3424	95	3583	3605	101	70-131	5.60	(< 20)
1,1-Dichloropropene	91.5U	3583	3492	98	3583	3719	104	76-125	6.60	(< 20)
1,2,3-Trichlorobenzene	183U	3583	3265	91	3583	3855	108	66-130	16.80	(< 20)
1,2,3-Trichloropropane	91.5U	3583	3673	103	3583	3946	110	73-125	7.00	(< 20)
1,2,4-Trichlorobenzene	91.5U	3583	3288	92	3583	3764	105	67-129	13.20	(< 20)
1,2,4-Trimethylbenzene	183U	3583	3537	99	3583	3787	106	75-123	6.70	(< 20)
1,2-Dibromo-3-chloropropane	366U	3583	3605	101	3583	4036	113	61-132	11.60	(< 20)
1,2-Dibromoethane	36.5U	3583	3696	103	3583	3946	110	78-122	6.60	(< 20)
1,2-Dichlorobenzene	91.5U	3583	3447	96	3583	3741	104	78-121	8.00	(< 20)
1,2-Dichloroethane	36.5U	3583	3243	91	3583	3515	99	73-128	8.40	(< 20)
1,2-Dichloropropane	36.5U	3583	3469	97	3583	3764	105	76-123	7.60	(< 20)
1,3,5-Trimethylbenzene	91.5U	3583	3492	98	3583	3787	106	73-124	7.60	(< 20)
1,3-Dichlorobenzene	91.5U	3583	3447	96	3583	3651	102	77-121	5.90	(< 20)
1,3-Dichloropropane	36.5U	3583	3605	101	3583	3878	109	77-121	7.50	(< 20)
1,4-Dichlorobenzene	91.5U	3583	3492	98	3583	3741	105	75-120	7.20	(< 20)
2,2-Dichloropropane	91.5U	3583	3696	103	3583	3696	103	67-133	0.16	(< 20)
2-Butanone (MEK)	915U	10726	10317	96	10726	12041	112	51-148	15.40	(< 20)
2-Chlorotoluene	91.5U	3583	3492	98	3583	3696	104	75-122	6.00	(< 20)
2-Hexanone	366U	10726	10522	98	10726	12132	113	53-145	14.30	(< 20)
4-Chlorotoluene	91.5U	3583	3515	99	3583	3764	105	72-124	6.50	(< 20)
4-Isopropyltoluene	91.5U	3583	3628	101	3583	3810	107	73-127	4.90	(< 20)
4-Methyl-2-pentanone (MIBK)	915U	10726	10408	97	10726	11655	109	65-135	11.50	(< 20)
Benzene	38.4J	3583	3424	95	3583	3673	102	77-121	7.30	(< 20)
Bromobenzene	91.5U	3583	3492	98	3583	3832	107	78-121	9.30	(< 20)
Bromochloromethane	91.5U	3583	3537	99	3583	3651	102	78-125	2.80	(< 20)
Bromodichloromethane	91.5U	3583	3469	97	3583	3741	105	75-127	7.70	(< 20)
Bromoform	91.5U	3583	3787	106	3583	3968	111	67-132	4.60	(< 20)
Bromomethane	730U	3583	3605	101	3583	3764	105	53-143	4.20	(< 20)
Carbon disulfide	366U	5374	5034	94	5374	5306	99	63-132	5.10	(< 20)
Carbon tetrachloride	45.7U	3583	3537	99	3583	3741	105	70-135	5.70	(< 20)
Chlorobenzene	91.5U	3583	3424	96	3583	3741	105	79-120	8.50	(< 20)
Chloroethane	730U	3583	3401	95	3583	3696	103	59-139	7.90	(< 20)

Print Date: 06/15/2017 5:49:50PM

Matrix Spike Summary

Original Sample ID: 1172890004
MS Sample ID: 1389237 MS
MSD Sample ID: 1389238 MSD

QC for Samples: 1172844009

Analysis Date: 06/06/2017 19:08
Analysis Date: 06/06/2017 14:03
Analysis Date: 06/06/2017 14:19
Matrix: Soil/Solid (dry weight)

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Chloroform	91.5U	3583	3311	92	3583	3537	99	78-123	7.20	(< 20)
Chloromethane	58.5J	3583	2812	77	3583	4444	122	50-136	45.20 *	(< 20)
cis-1,2-Dichloroethene	91.5U	3583	3288	92	3583	3560	100	77-123	7.80	(< 20)
cis-1,3-Dichloropropene	45.7U	3583	3696	104	3583	3946	110	74-126	6.30	(< 20)
Dibromochloromethane	91.5U	3583	3673	103	3583	3878	109	74-126	5.30	(< 20)
Dibromomethane	91.5U	3583	3537	99	3583	3787	106	78-125	6.80	(< 20)
Dichlorodifluoromethane	183U	3583	3401	95	3583	3537	99	29-149	4.40	(< 20)
Ethylbenzene	91.5U	3583	3447	96	3583	3673	102	76-122	6.30	(< 20)
Freon-113	366U	5374	5147	96	5374	5442	102	66-136	5.60	(< 20)
Hexachlorobutadiene	73.0U	3583	3424	96	3583	3719	104	61-135	8.20	(< 20)
Isopropylbenzene (Cumene)	91.5U	3583	3469	97	3583	3696	103	68-134	6.60	(< 20)
Methylene chloride	366U	3583	3537	99	3583	3832	107	70-128	7.60	(< 20)
Methyl-t-butyl ether	366U	5374	5374	100	5374	5782	108	73-125	7.50	(< 20)
Naphthalene	91.5U	3583	3469	97	3583	4059	113	62-129	15.80	(< 20)
n-Butylbenzene	91.5U	3583	3560	100	3583	3741	104	70-128	4.60	(< 20)
n-Propylbenzene	91.5U	3583	3560	99	3583	3810	106	73-125	6.80	(< 20)
o-Xylene	91.5U	3583	3424	96	3583	3673	103	77-123	6.90	(< 20)
P & M -Xylene	183U	7166	6848	96	7166	7211	101	77-124	5.40	(< 20)
sec-Butylbenzene	91.5U	3583	3583	100	3583	3741	105	73-126	4.30	(< 20)
Styrene	91.5U	3583	3401	95	3583	3673	103	76-124	7.90	(< 20)
tert-Butylbenzene	91.5U	3583	3583	100	3583	3741	105	73-125	4.30	(< 20)
Tetrachloroethene	31.1J	3583	3537	98	3583	3787	105	73-128	6.40	(< 20)
Toluene	91.5U	3583	3424	96	3583	3719	104	77-121	8.40	(< 20)
trans-1,2-Dichloroethene	91.5U	3583	3356	94	3583	3605	101	74-125	7.30	(< 20)
trans-1,3-Dichloropropene	45.7U	3583	3832	107	3583	4036	113	71-130	4.90	(< 20)
Trichloroethene	38.4J	3583	3424	95	3583	3696	102	77-123	7.50	(< 20)
Trichlorofluoromethane	183U	3583	4580	128	3583	3651	102	62-140	22.80 *	(< 20)
Vinyl acetate	366U	3583	3787	106	3583	3560	100	50-151	6.10	(< 20)
Vinyl chloride	36.5U	3583	3401	95	3583	3628	101	56-135	6.00	(< 20)
Xylenes (total)	274U	10726	10272	96	10726	10884	101	78-124	5.90	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		3583	3492	98	3583	3492	98	71-136	0.17	
4-Bromofluorobenzene (surr)		5964	4717	79	5964	5079	85	55-151	7.50	
Toluene-d8 (surr)		3583	3605	101	3583	3628	102	85-116	0.59	

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Matrix Spike Summary

Original Sample ID: 1172890004
MS Sample ID: 1389237 MS
MSD Sample ID: 1389238 MSD

QC for Samples: 1172844009

Analysis Date:
Analysis Date: 06/06/2017 14:03
Analysis Date: 06/06/2017 14:19
Matrix: Soil/Solid (dry weight)

Results by **SW8260C**

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

Batch Information

Analytical Batch: VMS16803
Analytical Method: SW8260C
Instrument: VQA 7890/5975 GC/MS
Analyst: NRO
Analytical Date/Time: 6/6/2017 2:03:00PM

Prep Batch: VXX30616
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 6/6/2017 6:00:00AM
Prep Initial Wt./Vol.: 23.76g
Prep Extract Vol: 25.00mL

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Method Blank

Blank ID: MB for HBN 1760570 [VXX/30617]
Blank Lab ID: 1389248

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,1-Trichloroethane	0.500U	1.00	0.310	ug/L
1,1,2,2-Tetrachloroethane	0.250U	0.500	0.150	ug/L
1,1,2-Trichloroethane	0.200U	0.400	0.120	ug/L
1,1-Dichloroethane	0.500U	1.00	0.310	ug/L
1,1-Dichloroethene	0.500U	1.00	0.310	ug/L
1,1-Dichloropropene	0.500U	1.00	0.310	ug/L
1,2,3-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,3-Trichloropropane	0.500U	1.00	0.310	ug/L
1,2,4-Trichlorobenzene	0.500U	1.00	0.310	ug/L
1,2,4-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,2-Dibromo-3-chloropropane	5.00U	10.0	3.10	ug/L
1,2-Dibromoethane	0.0375U	0.0750	0.0180	ug/L
1,2-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,2-Dichloroethane	0.250U	0.500	0.150	ug/L
1,2-Dichloropropane	0.500U	1.00	0.310	ug/L
1,3,5-Trimethylbenzene	0.500U	1.00	0.310	ug/L
1,3-Dichlorobenzene	0.500U	1.00	0.310	ug/L
1,3-Dichloropropane	0.250U	0.500	0.150	ug/L
1,4-Dichlorobenzene	0.250U	0.500	0.150	ug/L
2,2-Dichloropropane	0.500U	1.00	0.310	ug/L
2-Butanone (MEK)	5.00U	10.0	3.10	ug/L
2-Chlorotoluene	0.500U	1.00	0.310	ug/L
2-Hexanone	5.00U	10.0	3.10	ug/L
4-Chlorotoluene	0.500U	1.00	0.310	ug/L
4-Isopropyltoluene	0.500U	1.00	0.310	ug/L
4-Methyl-2-pentanone (MIBK)	5.00U	10.0	3.10	ug/L
Benzene	0.200U	0.400	0.120	ug/L
Bromobenzene	0.500U	1.00	0.310	ug/L
Bromochloromethane	0.500U	1.00	0.310	ug/L
Bromodichloromethane	0.250U	0.500	0.150	ug/L
Bromoform	0.500U	1.00	0.310	ug/L
Bromomethane	2.50U	5.00	1.50	ug/L
Carbon disulfide	5.00U	10.0	3.10	ug/L
Carbon tetrachloride	0.500U	1.00	0.310	ug/L
Chlorobenzene	0.250U	0.500	0.150	ug/L
Chloroethane	0.500U	1.00	0.310	ug/L
Chloroform	0.500U	1.00	0.310	ug/L

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Method Blank

Blank ID: MB for HBN 1760570 [VXX/30617]
Blank Lab ID: 1389248

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
Chloromethane	0.500U	1.00	0.310	ug/L
cis-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
cis-1,3-Dichloropropene	0.250U	0.500	0.150	ug/L
Dibromochloromethane	0.250U	0.500	0.150	ug/L
Dibromomethane	0.500U	1.00	0.310	ug/L
Dichlorodifluoromethane	0.500U	1.00	0.310	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
Freon-113	5.00U	10.0	3.10	ug/L
Hexachlorobutadiene	0.500U	1.00	0.310	ug/L
Isopropylbenzene (Cumene)	0.500U	1.00	0.310	ug/L
Methylene chloride	2.50U	5.00	1.00	ug/L
Methyl-t-butyl ether	5.00U	10.0	3.10	ug/L
Naphthalene	0.500U	1.00	0.310	ug/L
n-Butylbenzene	0.500U	1.00	0.310	ug/L
n-Propylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
sec-Butylbenzene	0.500U	1.00	0.310	ug/L
Styrene	0.500U	1.00	0.310	ug/L
tert-Butylbenzene	0.500U	1.00	0.310	ug/L
Tetrachloroethene	0.500U	1.00	0.310	ug/L
Toluene	0.500U	1.00	0.310	ug/L
trans-1,2-Dichloroethene	0.500U	1.00	0.310	ug/L
trans-1,3-Dichloropropene	0.500U	1.00	0.310	ug/L
Trichloroethene	0.500U	1.00	0.310	ug/L
Trichlorofluoromethane	0.500U	1.00	0.310	ug/L
Vinyl acetate	5.00U	10.0	3.10	ug/L
Vinyl chloride	0.0750U	0.150	0.0500	ug/L
Xylenes (total)	1.50U	3.00	1.00	ug/L
Surrogates				
1,2-Dichloroethane-D4 (surr)	106	81-118		%
4-Bromofluorobenzene (surr)	102	85-114		%
Toluene-d8 (surr)	98.4	89-112		%

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Method Blank

Blank ID: MB for HBN 1760570 [VXX/30617]
Blank Lab ID: 1389248

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units

Batch Information

Analytical Batch: VMS16804
Analytical Method: SW8260C
Instrument: VPA 780/5975 GC/MS
Analyst: NRB
Analytical Date/Time: 6/7/2017 2:39:00PM

Prep Batch: VXX30617
Prep Method: SW5030B
Prep Date/Time: 6/7/2017 6:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30617]
Blank Spike Lab ID: 1389249
Date Analyzed: 06/07/2017 16:17

Spike Duplicate ID: LCSD for HBN 1172844 [VXX30617]
Spike Duplicate Lab ID: 1389250
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	30	28.7	96	30	29.4	98	(78-124)	2.50	(< 20)
1,1,1-Trichloroethane	30	28.1	94	30	28.7	96	(74-131)	1.90	(< 20)
1,1,2,2-Tetrachloroethane	30	28.5	95	30	29.4	98	(71-121)	2.90	(< 20)
1,1,2-Trichloroethane	30	28.4	95	30	29.1	97	(80-119)	2.30	(< 20)
1,1-Dichloroethane	30	27.2	91	30	27.6	92	(77-125)	1.40	(< 20)
1,1-Dichloroethene	30	28.3	94	30	28.6	96	(71-131)	1.30	(< 20)
1,1-Dichloropropene	30	28.9	96	30	29.5	98	(79-125)	2.30	(< 20)
1,2,3-Trichlorobenzene	30	29.1	97	30	30.6	102	(69-129)	5.00	(< 20)
1,2,3-Trichloropropane	30	28.6	95	30	29.6	99	(73-122)	3.60	(< 20)
1,2,4-Trichlorobenzene	30	29.5	98	30	29.9	100	(69-130)	1.30	(< 20)
1,2,4-Trimethylbenzene	30	29.3	98	30	29.5	98	(79-124)	0.84	(< 20)
1,2-Dibromo-3-chloropropane	30	28.3	95	30	30.1	100	(62-128)	5.90	(< 20)
1,2-Dibromoethane	30	28.6	95	30	29.3	98	(77-121)	2.20	(< 20)
1,2-Dichlorobenzene	30	28.1	94	30	28.4	95	(80-119)	0.91	(< 20)
1,2-Dichloroethane	30	25.6	86	30	26.2	87	(73-128)	2.20	(< 20)
1,2-Dichloropropane	30	27.6	92	30	28.2	94	(78-122)	2.20	(< 20)
1,3,5-Trimethylbenzene	30	29.1	97	30	29.7	99	(75-124)	2.10	(< 20)
1,3-Dichlorobenzene	30	28.2	94	30	28.6	96	(80-119)	1.40	(< 20)
1,3-Dichloropropane	30	28.1	94	30	28.8	96	(80-119)	2.40	(< 20)
1,4-Dichlorobenzene	30	28.1	94	30	28.5	95	(79-118)	1.30	(< 20)
2,2-Dichloropropane	30	28.5	95	30	28.8	96	(60-139)	1.10	(< 20)
2-Butanone (MEK)	90	87.5	97	90	93.5	104	(56-143)	6.70	(< 20)
2-Chlorotoluene	30	28.7	96	30	29.2	97	(79-122)	1.80	(< 20)
2-Hexanone	90	86.7	96	90	92.7	103	(57-139)	6.70	(< 20)
4-Chlorotoluene	30	29.1	97	30	29.6	99	(78-122)	1.40	(< 20)
4-Isopropyltoluene	30	30.4	101	30	30.4	101	(77-127)	0.01	(< 20)
4-Methyl-2-pentanone (MIBK)	90	86.7	96	90	91.8	102	(67-130)	5.60	(< 20)
Benzene	30	27.9	93	30	28.5	95	(79-120)	2.40	(< 20)
Bromobenzene	30	27.8	93	30	28.5	95	(80-120)	2.50	(< 20)
Bromochloromethane	30	28.6	95	30	28.4	95	(78-123)	0.70	(< 20)
Bromodichloromethane	30	27.4	91	30	28.0	93	(79-125)	2.00	(< 20)
Bromoform	30	28.4	95	30	29.1	97	(66-130)	2.60	(< 20)
Bromomethane	30	25.0	83	30	25.3	85	(53-141)	1.30	(< 20)
Carbon disulfide	45	42.4	94	45	43.0	96	(64-133)	1.30	(< 20)

Print Date: 06/15/2017 5:49:54PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30617]
Blank Spike Lab ID: 1389249
Date Analyzed: 06/07/2017 16:17

Spike Duplicate ID: LCSD for HBN 1172844 [VXX30617]
Spike Duplicate Lab ID: 1389250
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **SW8260C**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Carbon tetrachloride	30	28.8	96	30	29.7	99	(72-136)	3.10	(< 20)
Chlorobenzene	30	27.1	90	30	28.0	93	(82-118)	3.20	(< 20)
Chloroethane	30	27.1	90	30	25.7	86	(60-138)	5.40	(< 20)
Chloroform	30	26.9	90	30	27.4	91	(79-124)	1.80	(< 20)
Chloromethane	30	25.8	86	30	27.2	91	(50-139)	5.10	(< 20)
cis-1,2-Dichloroethene	30	26.3	88	30	26.9	90	(78-123)	2.40	(< 20)
cis-1,3-Dichloropropene	30	28.2	94	30	28.9	96	(75-124)	2.20	(< 20)
Dibromochloromethane	30	28.6	95	30	29.0	97	(74-126)	1.50	(< 20)
Dibromomethane	30	26.4	88	30	26.8	89	(79-123)	1.30	(< 20)
Dichlorodifluoromethane	30	29.7	99	30	30.1	100	(32-152)	1.40	(< 20)
Ethylbenzene	30	28.2	94	30	28.8	96	(79-121)	1.90	(< 20)
Freon-113	45	44.1	98	45	44.6	99	(70-136)	1.00	(< 20)
Hexachlorobutadiene	30	31.6	105	30	29.4	98	(66-134)	7.10	(< 20)
Isopropylbenzene (Cumene)	30	28.8	96	30	29.3	98	(72-131)	2.00	(< 20)
Methylene chloride	30	27.0	90	30	27.4	91	(74-124)	1.40	(< 20)
Methyl-t-butyl ether	45	41.8	93	45	42.9	95	(71-124)	2.70	(< 20)
Naphthalene	30	29.0	97	30	32.1	107	(61-128)	10.00	(< 20)
n-Butylbenzene	30	31.5	105	30	30.9	103	(75-128)	2.20	(< 20)
n-Propylbenzene	30	29.4	98	30	29.7	99	(76-126)	0.99	(< 20)
o-Xylene	30	28.0	93	30	28.4	95	(78-122)	1.50	(< 20)
P & M -Xylene	60	56.6	94	60	57.4	96	(80-121)	1.50	(< 20)
sec-Butylbenzene	30	30.7	102	30	30.5	102	(77-126)	0.61	(< 20)
Styrene	30	28.1	94	30	29.1	97	(78-123)	3.40	(< 20)
tert-Butylbenzene	30	30.0	100	30	29.7	99	(78-124)	1.10	(< 20)
Tetrachloroethene	30	29.1	97	30	29.8	99	(74-129)	2.10	(< 20)
Toluene	30	27.2	91	30	27.9	93	(80-121)	2.80	(< 20)
trans-1,2-Dichloroethene	30	27.6	92	30	27.9	93	(75-124)	1.30	(< 20)
trans-1,3-Dichloropropene	30	28.8	96	30	29.2	97	(73-127)	1.30	(< 20)
Trichloroethene	30	28.3	94	30	29.0	97	(79-123)	2.70	(< 20)
Trichlorofluoromethane	30	28.9	96	30	28.9	96	(65-141)	0.07	(< 20)
Vinyl acetate	30	29.3	98	30	30.1	100	(54-146)	2.80	(< 20)
Vinyl chloride	30	26.9	90	30	27.3	91	(58-137)	1.60	(< 20)
Xylenes (total)	90	84.6	94	90	85.8	95	(79-121)	1.50	(< 20)

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30617]
Blank Spike Lab ID: 1389249
Date Analyzed: 06/07/2017 16:17

Spike Duplicate ID: LCSD for HBN 1172844 [VXX30617]
Spike Duplicate Lab ID: 1389250
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **SW8260C**

	Blank Spike (%)			Spike Duplicate (%)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Surrogates									
1,2-Dichloroethane-D4 (surr)	30	95	95	30	94.5	95	(81-118)	0.46	
4-Bromofluorobenzene (surr)	30	99.5	100	30	99.9	100	(85-114)	0.42	
Toluene-d8 (surr)	30	101	101	30	99.9	100	(89-112)	0.70	

Batch Information

Analytical Batch: **VMS16804**
Analytical Method: **SW8260C**
Instrument: **VPA 780/5975 GC/MS**
Analyst: **NRB**

Prep Batch: **VXX30617**
Prep Method: **SW5030B**
Prep Date/Time: **06/07/2017 06:00**
Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1760692 [VXX/30624]
Blank Lab ID: 1389576

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844010

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	104	50-150		%

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/8/2017 2:21:00PM

Prep Batch: VXX30624
Prep Method: SW5035A
Prep Date/Time: 6/8/2017 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 06/15/2017 5:49:56PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30624]
Blank Spike Lab ID: 1389579
Date Analyzed: 06/08/2017 13:25

Spike Duplicate ID: LCSD for HBN 1172844 [VXX30624]
Spike Duplicate Lab ID: 1389580
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844010

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	12.6	100	12.5	12.4	99	(60-120)	1.30	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	107	107	1.25	108	108	(50-150)	0.89	

Batch Information

Analytical Batch: **VFC13666**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX30624**
Prep Method: **SW5035A**
Prep Date/Time: **06/08/2017 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1760695 [VXX/30625]
Blank Lab ID: 1389598

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844008, 1172844009

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	105	50-150		%

Batch Information

Analytical Batch: VFC13666
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/9/2017 12:37:00AM

Prep Batch: VXX30625
Prep Method: SW5035A
Prep Date/Time: 6/8/2017 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30625]
Blank Spike Lab ID: 1389601
Date Analyzed: 06/08/2017 23:41

Spike Duplicate ID: LCSD for HBN 1172844 [VXX30625]
Spike Duplicate Lab ID: 1389602
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844008, 1172844009

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	12.7	101	12.5	12.6	101	(60-120)	0.23	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	107	107	1.25	107	107	(50-150)	0.02	

Batch Information

Analytical Batch: **VFC13666**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX30625**
Prep Method: **SW5035A**
Prep Date/Time: **06/08/2017 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1760696 [VXX/30626]
Blank Lab ID: 1389606

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844002, 1172844005

Results by **SW8260C**

Parameter	Results	LOQ/CL	DL	Units
1,1,1,2-Tetrachloroethane	10.0U	20.0	6.20	ug/Kg
1,1,2-Trichloroethane	5.00U	10.0	3.10	ug/Kg
1,2-Dibromoethane	5.00U	10.0	3.10	ug/Kg
1,3-Dichloropropane	5.00U	10.0	3.10	ug/Kg
2-Hexanone	50.0U	100	31.0	ug/Kg
Bromoform	12.5U	25.0	7.80	ug/Kg
Chlorobenzene	12.5U	25.0	7.80	ug/Kg
Dibromochloromethane	12.5U	25.0	7.80	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
Isopropylbenzene (Cumene)	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Styrene	12.5U	25.0	7.80	ug/Kg
Tetrachloroethene	6.25U	12.5	3.90	ug/Kg
Toluene	12.5U	25.0	7.80	ug/Kg
trans-1,3-Dichloropropene	6.25U	12.5	3.90	ug/Kg
Surrogates				
1,2-Dichloroethane-D4 (surr)	109	71-136		%
4-Bromofluorobenzene (surr)	87.7	55-151		%
Toluene-d8 (surr)	96.4	85-116		%

Batch Information

Analytical Batch: VMS16807
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: NRO
Analytical Date/Time: 6/8/2017 12:37:00PM

Prep Batch: VXX30626
Prep Method: SW5035A
Prep Date/Time: 6/8/2017 6:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30626]
Blank Spike Lab ID: 1389607
Date Analyzed: 06/08/2017 12:53

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844002, 1172844005

Results by **SW8260C**

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1,1,1,2-Tetrachloroethane	750	755	101	(78-125)
1,1,2-Trichloroethane	750	732	98	(78-121)
1,2-Dibromoethane	750	754	100	(78-122)
1,3-Dichloropropane	750	733	98	(77-121)
2-Hexanone	2250	2180	97	(53-145)
Bromoform	750	724	97	(67-132)
Chlorobenzene	750	711	95	(79-120)
Dibromochloromethane	750	721	96	(74-126)
Ethylbenzene	750	712	95	(76-122)
Isopropylbenzene (Cumene)	750	714	95	(68-134)
o-Xylene	750	715	95	(77-123)
P & M -Xylene	1500	1430	95	(77-124)
Styrene	750	729	97	(76-124)
Tetrachloroethene	750	748	100	(73-128)
Toluene	750	699	93	(77-121)
trans-1,3-Dichloropropene	750	775	103	(71-130)
Surrogates				
1,2-Dichloroethane-D4 (surr)	750	98.7	99	(71-136)
4-Bromofluorobenzene (surr)	750	89.9	90	(55-151)
Toluene-d8 (surr)	750	101	101	(85-116)

Batch Information

Analytical Batch: **VMS16807**
Analytical Method: **SW8260C**
Instrument: **Agilent 7890-75MS**
Analyst: **NRO**

Prep Batch: **VXX30626**
Prep Method: **SW5035A**
Prep Date/Time: **06/08/2017 06:00**
Spike Init Wt./Vol.: 750 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: Extract Vol:

Print Date: 06/15/2017 5:50:09PM

Matrix Spike Summary

Original Sample ID: 1173121004
MS Sample ID: 1389608 MS
MSD Sample ID: 1389609 MSD

Analysis Date: 06/08/2017 19:50
Analysis Date: 06/08/2017 20:06
Analysis Date: 06/08/2017 20:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844002, 1172844005

Results by **SW8260C**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1,1,1,2-Tetrachloroethane	40.0U	2361	2347	99	2361	2390	101	78-125	1.80	(< 20)
1,1,2-Trichloroethane	20.0U	2361	2319	98	2361	2447	103	78-121	5.50	(< 20)
1,2-Dibromoethane	20.0U	2361	2347	99	2361	2518	106	78-122	7.10	(< 20)
1,3-Dichloropropane	20.0U	2361	2290	97	2361	2447	104	77-121	7.00	(< 20)
2-Hexanone	200U	7098	6743	95	7098	6501	92	53-145	3.60	(< 20)
Bromoform	50.0U	2361	2176	92	2361	2148	91	67-132	1.70	(< 20)
Chlorobenzene	50.0U	2361	2276	96	2361	2233	94	79-120	2.10	(< 20)
Dibromochloromethane	50.0U	2361	2205	93	2361	2390	101	74-126	8.10	(< 20)
Ethylbenzene	50.0U	2361	2276	96	2361	2276	96	76-122	0.17	(< 20)
Isopropylbenzene (Cumene)	50.0U	2361	2205	93	2361	2319	98	68-134	5.20	(< 20)
o-Xylene	50.0U	2361	2262	96	2361	2105	89	77-123	7.00	(< 20)
P & M -Xylene	100U	4737	4509	95	4737	4125	87	77-124	8.80	(< 20)
Styrene	50.0U	2361	2304	97	2361	2162	91	76-124	6.20	(< 20)
Tetrachloroethene	25.0U	2361	2404	102	2361	2475	104	73-128	2.90	(< 20)
Toluene	50.0U	2361	2233	94	2361	2262	96	77-121	1.40	(< 20)
trans-1,3-Dichloropropene	25.0U	2361	2390	101	2361	2575	109	71-130	7.20	(< 20)
Surrogates										
1,2-Dichloroethane-D4 (surr)		2361	2361	100	2361	2390	101	71-136	1.50	
4-Bromofluorobenzene (surr)		3940	3755	95	3940	4154	105	55-151	10.00	
Toluene-d8 (surr)		2361	2390	101	2361	2489	105	85-116	4.50	

Batch Information

Analytical Batch: VMS16807
Analytical Method: SW8260C
Instrument: Agilent 7890-75MS
Analyst: NRO
Analytical Date/Time: 6/8/2017 8:06:00PM

Prep Batch: VXX30626
Prep Method: Vol. Extraction SW8260 Field Extracted L
Prep Date/Time: 6/8/2017 6:00:00AM
Prep Initial Wt./Vol.: 22.55g
Prep Extract Vol: 25.00mL

Print Date: 06/15/2017 5:50:10PM

Method Blank

Blank ID: MB for HBN 1760753 [VXX/30634]
Blank Lab ID: 1389881

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	103	50-150		%

Batch Information

Analytical Batch: VFC13668
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: ST
Analytical Date/Time: 6/9/2017 11:41:00AM

Prep Batch: VXX30634
Prep Method: SW5030B
Prep Date/Time: 6/9/2017 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [VXX30634]
Blank Spike Lab ID: 1389884
Date Analyzed: 06/09/2017 12:37

Spike Duplicate ID: LCSD for HBN 1172844 [VXX30634]
Spike Duplicate Lab ID: 1389885
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172844011, 1172844012, 1172844013, 1172844014, 1172844015

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.06	106	1.00	1.02	102	(60-120)	3.60	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	112	112	0.0500	111	111	(50-150)	0.55	

Batch Information

Analytical Batch: **VFC13668**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **ST**

Prep Batch: **VXX30634**
Prep Method: **SW5030B**
Prep Date/Time: **06/09/2017 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1760089 [XXX/37465]
Blank Lab ID: 1387973

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172844011, 1172844012, 1172844013, 1172844014

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
2-Methylnaphthalene	0.0250U	0.0500	0.0150	ug/L
Acenaphthene	0.0250U	0.0500	0.0150	ug/L
Acenaphthylene	0.0250U	0.0500	0.0150	ug/L
Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo(a)Anthracene	0.0250U	0.0500	0.0150	ug/L
Benzo[a]pyrene	0.0100U	0.0200	0.00620	ug/L
Benzo[b]Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Benzo[g,h,i]perylene	0.0250U	0.0500	0.0150	ug/L
Benzo[k]fluoranthene	0.0250U	0.0500	0.0150	ug/L
Chrysene	0.0250U	0.0500	0.0150	ug/L
Dibenzo[a,h]anthracene	0.0100U	0.0200	0.00620	ug/L
Fluoranthene	0.0250U	0.0500	0.0150	ug/L
Fluorene	0.0250U	0.0500	0.0150	ug/L
Indeno[1,2,3-c,d] pyrene	0.0250U	0.0500	0.0150	ug/L
Naphthalene	0.0500U	0.100	0.0310	ug/L
Phenanthrene	0.0250U	0.0500	0.0150	ug/L
Pyrene	0.0250U	0.0500	0.0150	ug/L
Surrogates				
2-Fluorobiphenyl (surr)	85.1	53-106		%
Terphenyl-d14 (surr)	89.7	58-132		%

Batch Information

Analytical Batch: XMS10080
Analytical Method: 8270D SIM LV (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: S.G
Analytical Date/Time: 6/4/2017 6:49:00PM

Prep Batch: XXX37465
Prep Method: SW3520C
Prep Date/Time: 6/2/2017 9:11:19AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [XXX37465]
Blank Spike Lab ID: 1387974
Date Analyzed: 06/04/2017 19:09

Spike Duplicate ID: LCSD for HBN 1172844 [XXX37465]
Spike Duplicate Lab ID: 1387975
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172844011, 1172844012, 1172844013, 1172844014

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

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	2	1.29	65	2	1.65	83	(41-115)	24.60	* (< 20)
2-Methylnaphthalene	2	1.21	61	2	1.55	77	(39-114)	24.20	* (< 20)
Acenaphthene	2	1.61	80	2	2.08	104	(48-114)	25.80	* (< 20)
Acenaphthylene	2	1.31	66	2	1.70	85	(35-121)	26.00	* (< 20)
Anthracene	2	1.41	70	2	1.79	89	(53-119)	23.70	* (< 20)
Benzo(a)Anthracene	2	1.36	68	2	1.70	85	(59-120)	21.80	* (< 20)
Benzo[a]pyrene	2	1.38	69	2	1.70	85	(53-120)	20.60	* (< 20)
Benzo[b]Fluoranthene	2	1.37	69	2	1.68	84	(53-126)	20.20	* (< 20)
Benzo[g,h,i]perylene	2	1.27	64	2	1.67	83	(44-128)	26.70	* (< 20)
Benzo[k]fluoranthene	2	1.33	67	2	1.65	83	(54-125)	21.40	* (< 20)
Chrysene	2	1.41	70	2	1.72	86	(57-120)	20.20	* (< 20)
Dibenzo[a,h]anthracene	2	1.21	61	2	1.65	82	(44-131)	30.80	* (< 20)
Fluoranthene	2	1.31	65	2	1.65	83	(58-120)	23.20	* (< 20)
Fluorene	2	1.33	67	2	1.71	86	(50-118)	25.10	* (< 20)
Indeno[1,2,3-c,d] pyrene	2	1.32	66	2	1.66	83	(48-130)	22.30	* (< 20)
Naphthalene	2	1.21	61	2	1.56	78	(43-114)	24.80	* (< 20)
Phenanthrene	2	1.30	65	2	1.64	82	(53-115)	23.60	* (< 20)
Pyrene	2	1.37	69	2	1.74	87	(53-121)	23.70	* (< 20)
Surrogates									
2-Fluorobiphenyl (surr)	2	71.3	71	2	90.8	91	(53-106)	24.20	
Terphenyl-d14 (surr)	2	75.5	76	2	91.7	92	(58-132)	19.40	

Batch Information

Analytical Batch: **XMS10080**
Analytical Method: **8270D SIM LV (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **S.G**

Prep Batch: **XXX37465**
Prep Method: **SW3520C**
Prep Date/Time: **06/02/2017 09:11**
Spike Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 2 ug/L Extract Vol: 1 mL

Print Date: 06/15/2017 5:50:20PM

Method Blank

Blank ID: MB for HBN 1760093 [XXX/37467]
Blank Lab ID: 1387987

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844009

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	82.2	60-120		%

Batch Information

Analytical Batch: XFC13385
Analytical Method: AK102
Instrument: Agilent 7890B F
Analyst: FDR
Analytical Date/Time: 6/2/2017 2:45:00PM

Prep Batch: XXX37467
Prep Method: SW3550C
Prep Date/Time: 6/2/2017 9:09:09AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 06/15/2017 5:50:22PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [XXX37467]
Blank Spike Lab ID: 1387988
Date Analyzed: 06/02/2017 14:54

Spike Duplicate ID: LCSD for HBN 1172844 [XXX37467]
Spike Duplicate Lab ID: 1387989
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844001, 1172844002, 1172844003, 1172844004, 1172844005, 1172844006, 1172844007, 1172844008, 1172844009

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	167	100	167	167	100	(75-125)	0.20	(< 20)
Surrogates									
5a Androstane (surr)	3.33	102	102	3.33	100	100	(60-120)	1.40	

Batch Information

Analytical Batch: **XFC13385**
Analytical Method: **AK102**
Instrument: **Agilent 7890B F**
Analyst: **FDR**

Prep Batch: **XXX37467**
Prep Method: **SW3550C**
Prep Date/Time: **06/02/2017 09:09**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1760352 [XXX/37477]
Blank Lab ID: 1388322

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1172844011, 1172844012, 1172844013, 1172844014

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.190J	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	98.4	60-120		%

Batch Information

Analytical Batch: XFC13411
Analytical Method: AK102
Instrument: Agilent 7890B R
Analyst: JMG
Analytical Date/Time: 6/10/2017 4:41:00PM

Prep Batch: XXX37477
Prep Method: SW3520C
Prep Date/Time: 6/5/2017 8:25:32AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [XXX37477]
Blank Spike Lab ID: 1388323
Date Analyzed: 06/10/2017 16:50

Spike Duplicate ID: LCSD for HBN 1172844 [XXX37477]
Spike Duplicate Lab ID: 1388324
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1172844011, 1172844012, 1172844013, 1172844014

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	18.4	92	20	17.7	88	(75-125)	4.30	(< 20)
Surrogates									
5a Androstane (surr)	0.4	106	106	0.4	102	102	(60-120)	4.70	

Batch Information

Analytical Batch: **XFC13411**
Analytical Method: **AK102**
Instrument: **Agilent 7890B R**
Analyst: **JMG**

Prep Batch: **XXX37477**
Prep Method: **SW3520C**
Prep Date/Time: **06/05/2017 08:25**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1760388 [XXX/37487]
Blank Lab ID: 1388494

Matrix: Soil/Solid (dry weight)

QC for Samples:
1172844003, 1172844006, 1172844009

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	12.5U	25.0	7.50	ug/Kg
2-Methylnaphthalene	12.5U	25.0	7.50	ug/Kg
Acenaphthene	12.5U	25.0	7.50	ug/Kg
Acenaphthylene	12.5U	25.0	7.50	ug/Kg
Anthracene	12.5U	25.0	7.50	ug/Kg
Benzo(a)Anthracene	12.5U	25.0	7.50	ug/Kg
Benzo[a]pyrene	12.5U	25.0	7.50	ug/Kg
Benzo[b]Fluoranthene	12.5U	25.0	7.50	ug/Kg
Benzo[g,h,i]perylene	12.5U	25.0	7.50	ug/Kg
Benzo[k]fluoranthene	12.5U	25.0	7.50	ug/Kg
Chrysene	12.5U	25.0	7.50	ug/Kg
Dibenzo[a,h]anthracene	12.5U	25.0	7.50	ug/Kg
Fluoranthene	12.5U	25.0	7.50	ug/Kg
Fluorene	12.5U	25.0	7.50	ug/Kg
Indeno[1,2,3-c,d] pyrene	12.5U	25.0	7.50	ug/Kg
Naphthalene	10.0U	20.0	6.00	ug/Kg
Phenanthrene	12.5U	25.0	7.50	ug/Kg
Pyrene	12.5U	25.0	7.50	ug/Kg
Surrogates				
2-Fluorobiphenyl (surr)	91.5	46-115		%
Terphenyl-d14 (surr)	102	58-133		%

Batch Information

Analytical Batch: XMS10085
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: S.G
Analytical Date/Time: 6/5/2017 8:53:00PM

Prep Batch: XXX37487
Prep Method: SW3550C
Prep Date/Time: 6/5/2017 1:25:09PM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 5 mL

Print Date: 06/15/2017 5:50:31PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1172844 [XXX37487]
Blank Spike Lab ID: 1388495
Date Analyzed: 06/05/2017 21:14

Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844003, 1172844006, 1172844009

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

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	111	91.2	82	(43-111)
2-Methylnaphthalene	111	84.6	76	(39-114)
Acenaphthene	111	118	106	(44-111)
Acenaphthylene	111	95.1	86	(39-116)
Anthracene	111	107	96	(50-114)
Benzo(a)Anthracene	111	97.2	87	(54-122)
Benzo[a]pyrene	111	98.9	89	(50-125)
Benzo[b]Fluoranthene	111	98.7	89	(53-128)
Benzo[g,h,i]perylene	111	100	90	(49-127)
Benzo[k]fluoranthene	111	96.7	87	(56-123)
Chrysene	111	100	90	(57-118)
Dibenzo[a,h]anthracene	111	105	94	(50-129)
Fluoranthene	111	94.0	85	(55-119)
Fluorene	111	98.7	89	(47-114)
Indeno[1,2,3-c,d] pyrene	111	102	92	(49-130)
Naphthalene	111	82.5	74	(38-111)
Phenanthrene	111	98.5	89	(49-113)
Pyrene	111	97.1	87	(55-117)
Surrogates				
2-Fluorobiphenyl (surr)	22.2	94.5	95	(46-115)
Terphenyl-d14 (surr)	22.2	104	104	(58-133)

Batch Information

Analytical Batch: **XMS10085**
Analytical Method: **8270D SIM (PAH)**
Instrument: **SVA Agilent 780/5975 GC/MS**
Analyst: **S.G**

Prep Batch: **XXX37487**
Prep Method: **SW3550C**
Prep Date/Time: **06/05/2017 13:25**
Spike Init Wt./Vol.: 111 ug/Kg Extract Vol: 5 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1172925009
MS Sample ID: 1388496 MS
MSD Sample ID: 1388497 MSD

Analysis Date: 06/06/2017 3:45
Analysis Date: 06/06/2017 4:06
Analysis Date: 06/06/2017 4:26
Matrix: Soil/Solid (dry weight)

QC for Samples: 1172844003, 1172844006, 1172844009

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

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
1-Methylnaphthalene	28.0U	125	116	93	125	116	92	43-111	0.09	(< 20)
2-Methylnaphthalene	28.0U	125	109	87	125	111	88	39-114	1.80	(< 20)
Acenaphthene	28.0U	125	144	114 *	125	145	116 *	44-111	1.50	(< 20)
Acenaphthylene	28.0U	125	115	92	125	115	92	39-116	0.04	(< 20)
Anthracene	28.0U	125	118	94	125	119	95	50-114	0.74	(< 20)
Benzo(a)Anthracene	28.0U	125	120	95	125	122	97	54-122	1.80	(< 20)
Benzo[a]pyrene	28.0U	125	99.1	79	125	99.3	79	50-125	0.19	(< 20)
Benzo[b]Fluoranthene	28.0U	125	109	87	125	115	92	53-128	5.10	(< 20)
Benzo[g,h,i]perylene	28.0U	125	62.8	50	125	64.2	51	49-127	2.20	(< 20)
Benzo[k]fluoranthene	28.0U	125	99.3	79	125	99.1	79	56-123	0.23	(< 20)
Chrysene	28.0U	125	130	104	125	136	108	57-118	3.70	(< 20)
Dibenzo[a,h]anthracene	28.0U	125	73.1	58	125	73.8	59	50-129	0.88	(< 20)
Fluoranthene	28.0U	125	123	99	125	128	101	55-119	2.90	(< 20)
Fluorene	28.0U	125	119	95	125	122	98	47-114	3.10	(< 20)
Indeno[1,2,3-c,d] pyrene	28.0U	125	66.6	53	125	67.5	54	49-130	1.20	(< 20)
Naphthalene	22.4U	125	103	82	125	104	83	38-111	0.68	(< 20)
Phenanthrene	28.0U	125	122	98	125	124	99	49-113	1.70	(< 20)
Pyrene	28.0U	125	130	104	125	134	107	55-117	3.20	(< 20)
Surrogates										
2-Fluorobiphenyl (surr)		125	120	96	125	121	96	46-115	0.66	
Terphenyl-d14 (surr)		125	131	105	125	133	107	58-133	2.00	

Batch Information

Analytical Batch: XMS10087
Analytical Method: 8270D SIM (PAH)
Instrument: SVA Agilent 780/5975 GC/MS
Analyst: S.G
Analytical Date/Time: 6/6/2017 4:06:00AM

Prep Batch: XXX37487
Prep Method: Sonication Extr Soil 8270 PAH SIM 5ml
Prep Date/Time: 6/5/2017 1:25:09PM
Prep Initial Wt./Vol.: 22.53g
Prep Extract Vol: 5.00mL

Print Date: 06/15/2017 5:50:36PM

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CHAIN OF CUSTODY RECORD

1172844

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

Page 1 of 2

Section 1

CLIENT: RSE

CONTACT: Arran Forbes PHONE NO: 907 278 1023

PROJECT NAME: RAVN Site Investigation PROJECT/ PWSID/ PERMIT#:

REPORTS TO: RSE E-MAIL: aforbes@rsiarsci.com

INVOICE TO: RSE QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Section 3 Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative									REMARKS/ LOC ID
								HCl	HCl							
							DRO	GRO	VOC	PAH						
(1) A-B	RSE-3-5	05/31/17	0910	soil	2	G	X	X	X							
(2) A-B	RSE-3-27	05/31/17	1120	soil	2	G	X	X	X							
(3) A-B	RSE-2-1	05/31/17	1200	soil	2	G	X	X	X	X						
(4) A-B	RSE-2-3	05/31/17	1230	soil	2	G	X	X	X							
(5) A-B	RSE-2-20	05/31/17	1425	soil	2	G	X	X	X							
(6) A-B	RSE-1-4	05/21/17	1715	soil	2	G	X	X	X	X						
(7) A-B	RSE-1-6	05/21/17	1735	soil	2	G	X	X	X							
(8) A-B	RSE-1-20	05/31/17	1855	soil	2	G	X	X	X							
(9) A-B	RSE-X	05/31/17	1800	soil	2	G	X	X	X	X						
(10) A	Trip Blank soil															

Section 5

Relinquished By: (1)	Date	Time	Received By:
	6/1/17	0950	
Relinquished By: (2)	Date	Time	Received By:
Relinquished By: (3)	Date	Time	Received By:
	6/1/17		
Relinquished By: (4) ARC 6/1/17	Date 6/1/17	Time 0950	Received For Laboratory By:

Section 4

DOD Project? Yes / (No)

Cooler ID:

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Standard TAT

Temp Blank °C: 4.6° #D30

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

HD

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301

[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

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CHAIN OF CUSTODY RECORD

1172844

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

Section 1

CLIENT: Restoration Science

CONTACT: Arran Forbes — PHONE #: 907-278-1023 x 109

PROJECT NAME: site investigation RAVN ~~ANC Site Char~~ — Project/ PWSID/ PERMIT#:

REPORTS TO: Arran Forbes — E-MAIL: aforbes@restorsci.com

INVOICE TO: Restoration Science — QUOTE #: — P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Pres: Type: Comp Grab MI (Multi-Incremental)	Preservative: HCL GRO (AK101)	HCL VOCs (8260C)	HCL DRO (AK102) LV	None PAH (8270D-SIM) LV	REMARKS/ LOC ID
11 A-J	RSE-1	05/31/17	2020	H_2O	10	G	X	X	X	X	
12 A-J	RSE-2	05/31/17	1045	H_2O	10	G	X	X	X	X	
13 A-J	RSE-3	05/31/17	1740	H_2O	10	G	X	X	X	X	
14 A-J	RSE-X	05/31/17	1900	H_2O	10	G	X	X	X	X	
15 A-F	H_2O TripBlank										

Section 5

	Date	Time	
Relinquished By: (1)	6/1/17	0950	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	6/1/17	0950	Received For Laboratory By: Anne Collie

Section 4

DOD Project? Yes No

Data Deliverable Requirements:

Cooler ID:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 4.6 #D30 or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

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

e-Sample Receipt Form

SGS Workorder #: **1172844**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	ABSENT
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 4.6 °C Therm. ID: D30
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	n/a	
If <0°C, were sample containers ice free?	n/a	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	yes	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	yes	
Were all soil VOAs field extracted with MeOH+BFB?	yes	

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

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition
1172844001-A	No Preservative Required	OK
1172844001-B	Methanol field pres. 4 C	OK
1172844002-A	No Preservative Required	OK
1172844002-B	Methanol field pres. 4 C	OK
1172844003-A	No Preservative Required	OK
1172844003-B	Methanol field pres. 4 C	OK
1172844004-A	No Preservative Required	OK
1172844004-B	Methanol field pres. 4 C	OK
1172844005-A	No Preservative Required	OK
1172844005-B	Methanol field pres. 4 C	OK
1172844006-A	No Preservative Required	OK
1172844006-B	Methanol field pres. 4 C	OK
1172844007-A	No Preservative Required	OK
1172844007-B	Methanol field pres. 4 C	OK
1172844008-A	No Preservative Required	OK
1172844008-B	Methanol field pres. 4 C	OK
1172844009-A	No Preservative Required	OK
1172844009-B	Methanol field pres. 4 C	OK
1172844010-A	Methanol field pres. 4 C	OK
1172844011-A	HCL to pH < 2	OK
1172844011-B	HCL to pH < 2	OK
1172844011-C	HCL to pH < 2	OK
1172844011-D	HCL to pH < 2	OK
1172844011-E	HCL to pH < 2	OK
1172844011-F	HCL to pH < 2	OK
1172844011-G	HCL to pH < 2	OK
1172844011-H	HCL to pH < 2	OK
1172844011-I	No Preservative Required	OK
1172844011-J	No Preservative Required	OK
1172844012-A	HCL to pH < 2	OK
1172844012-B	HCL to pH < 2	OK
1172844012-C	HCL to pH < 2	OK
1172844012-D	HCL to pH < 2	OK
1172844012-E	HCL to pH < 2	OK
1172844012-F	HCL to pH < 2	OK
1172844012-G	HCL to pH < 2	OK
1172844012-H	HCL to pH < 2	OK
1172844012-I	No Preservative Required	OK
1172844012-J	No Preservative Required	OK
1172844013-A	HCL to pH < 2	OK
1172844013-B	HCL to pH < 2	OK
1172844013-C	HCL to pH < 2	OK
1172844013-D	HCL to pH < 2	OK
1172844013-E	HCL to pH < 2	OK
1172844013-F	HCL to pH < 2	OK
1172844013-G	HCL to pH < 2	OK
1172844013-H	HCL to pH < 2	OK
1172844013-I	No Preservative Required	OK
1172844013-J	No Preservative Required	OK
1172844014-A	HCL to pH < 2	OK
1172844014-B	HCL to pH < 2	OK
1172844014-C	HCL to pH < 2	OK
1172844014-D	HCL to pH < 2	OK
1172844014-E	HCL to pH < 2	OK
1172844014-F	HCL to pH < 2	OK
1172844014-G	HCL to pH < 2	OK
1172844014-H	HCL to pH < 2	OK
1172844014-I	No Preservative Required	OK
1172844014-J	No Preservative Required	OK
1172844015-A	HCL to pH < 2	OK
1172844015-B	HCL to pH < 2	OK
1172844015-C	HCL to pH < 2	OK
1172844015-D	HCL to pH < 2	OK
1172844015-E	HCL to pH < 2	OK
1172844015-F	HCL to pH < 2	OK

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM- The container was received damaged.
FR- The container was received frozen and not usable for Bacteria or BOD analyses.
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.

Attachment H: Approval to Transport Form

RESTORATION
Science & Engineering, LLC

ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites and Prevention and Emergency Response Programs

Transport, Treatment, & Disposal Approval Form for Contaminated Media

DEC HAZARD/SPILL ID #	NAME OF SPILL OR CONTAMINATED SITE	
2100.38.558	RAVN ANC	
SITE OR SPILL LOCATION		
4700 Old International Airport Road, Anchorage AK		
CURRENT LOCATION AND TYPE OF CONTAMINATED MEDIA		**SOURCE OF THE CONTAMINATION**
Soil, in 55-gallon sealed drums on site		Leaking av-gas AST
COMPOUNDS OF CONCERN	**ESTIMATED VOLUME**	**DATE(S) GENERATED**
DRO, GRO, VOC, PAH	2 yards	5/31/17
POST TREATMENT ANALYSIS REQUIRED *(such as GRO, DRO, RRO, BTEX, and/or Chlorinated Solvents)*		
DRO, VOC, PAH, Trichloroethene		
COMMENTS		

Facility Accepting the Contaminated Media

NAME OF THE FACILITY	PHYSICAL ADDRESS/PHONE NUMBER
Alaska Soil Recycling	2301 Spar Avenue Anchorage AK 907-348-6700

Responsible Party and Contractor Information

BUSINESS/NAME	ADDRESS/PHONE NUMBER
RAVN Air, Terry French	4700 Old International Airport Road, Anchorage AK 907-248-4422
RSE, Arran Forbes	911 West 8th Avenue, Anchorage AK 907-278-1023

Arran Forbes
Name of the Person Requesting Approval (printed)

QEP, RSE
Title/Association

Signature

9/20/17
Date

907-278-1023
Phone Number

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

Based on the information provided, ADEC approves transport of the above-described media for treatment in accordance with the approved facility operations plan. The Responsible Party or their consultant must submit to the DEC Project Manager a copy of weight/volume receipts of the loads transported to the facility and a post treatment analytical report. If the media is contaminated soil, it shall be transported as a covered load in compliance with 18 AAC 60.015.

DEC Project Manager Name (printed)

Project Manager Title

Signature

Date

Phone Number

*** IN CASE OF EMERGENCY CALL 1-800-899-4672 ***

122796-PARK

NON-HAZARDOUS WASTE MANIFEST

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

86

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. EXEMPT

Manifest Document No. 122796A

2. Page 1 of 1

3. Generator's Name and Mailing Address
RAVN ALASKA
4700 OLD INTERNATIONAL AIRPORT
ANCHORAGE, AK 99502

RAVN ALASKA
4700 OLD INTERNATIONAL AIRPORT
ANCHORAGE, AK 99502

4. Generator's Phone ((907) 266-8387

5. Transporter 1 Company Name: NRC ALASKA LLC

6. US EPA ID Number: AKR000004184

A. State Transporter's ID

B. Transporter 1 Phone (907) 258-1558

7. Transporter 2 Company Name

8. US EPA ID Number

C. State Transporter's ID

D. Transporter 2 Phone

9. Designated Facility Name and Site Address
NRC ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

10. US EPA ID Number: AKR000004184

E. State Facility's ID

F. Facility's Phone (907) 258-1558

HM	11. WASTE DESCRIPTION	Containers No.	Type	13. Total Quantity	14. Unit Wt./Vol.
a.	Material Not Regulated by DOT	11	DM	10,400	P
b.	MATERIAL NOT REGULATED BY DOT	1	DM	500	P
c.					
d.					

G. Additional Descriptions for Materials Listed Above
1) EA0708 ADEC REPORTABLE CONTAMINATED SOIL 55 DM
2) EA0708 ADEC REPORTABLE CONTAINATED SOIL 85 DM

H. Handling Codes for Wastes Listed Above
D14095

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

16. GENERATOR'S CERTIFICATION: 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	Signature	Date (Month Day Year)
X Gregorio Avila		2 20 18

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)
Royce Tisdale JR	Royce Tisdale JR	2 20 18

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Date (Month Day Year)

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)
Patricia L Beasley	Patricia L Beasley	02 22 18

NON-HAZARDOUS WASTE

GENERATOR

TRANSPORTER

FACILITY

NRC ALASKA

CERTIFICATE OF DISPOSAL/RECYCLE

GENERATOR: RAVN ALASKA
4700 OLD INTERNATIONAL AIRPORT
ANCHORAGE, AK 99502

DISPOSAL FACILITY: NRC ALASKA LLC
2020 VIKING DRIVE
ANCHORAGE, AK 99501

EPA ID NUMBER: EXEMPT
MANIFEST/DOCUMENT #: 122796A
DATE OF DISPOSAL/RECYCLE: FEB-22-2018

LINE	WASTE DESCRIPTION	CONTAINERS	TYPE	QUANTITY	UOM
1	ADEC REPORTABLE CONTAMINATED SOIL	11	DM	10400	P
2	ADEC REPORTABLE CONTAMINATED SOIL	1	DM	500	P

I certify, on behalf of the above listed treatment facility, that to the best of my knowledge, the above described waste was managed in compliance with all applicable laws, regulations, permits and licenses on the date listed above.

PREPARED BY: PLB

SIGNATURE: Patricia L Beasley **DATE:** FEB 22 2018

425 Outer Springer Loop Road - Palmer, AK 99645 - (907) 258-1558 - Fax (907) 746-3651 - Toll Free (877) 375-5040

Attachment I: Arran Forbes Resume

RESTORATION
Science & Engineering, LLC

Arran Forbes

Environmental Scientist

Areas of Expertise

Phase I ESA
Phase II ESA
Regulatory Compliance
Groundwater Monitoring
Contaminated Sites
Formerly Used Defense Sites
Chemistry & Biology
Storm Water Management
NEPA Permitting

Years of Experience

With RSE: 4 Years
Total: 6 Years

Education

B.S., 2009, Environmental Science
Dartmouth College

Registration/Certification

HAZWOPER 40 hour OSHA Training (2011 -2013)

Shipley Group Certification:

"Applying the NEPA Process and Writing Effective NEPA Documents" and, "NEPA Cumulative Effects Analysis and Documentation."

ADEC Qualified Environmental Professional

Certified Erosion and Sediment Control Lead (CESCL)

Overview

Ms. Arran Forbes is an Environmental Scientist for RSE in Anchorage, Alaska and brings six years of environmental experience. She is a born and raised Alaskan and received her B.S. in environmental science from Dartmouth College. She has extensive experience in conducting Phase I and Phase II site investigations in accordance with both ADEC and ASTM standards around the state of Alaska. She has served as a technical lead for dozens of environmental assessments requiring compiling historical data from the site to determine future actions, preparing work plans and waste characterization documents for ADEC approval, performing soil, groundwater, and surface water sampling, and conducting in-depth analysis of field-screening and laboratory results for presentation to stakeholder agencies and clients. Arran frequently is asked to prepare MSGP and CGP SWPPPs for our clients including providing SWPPP compliance inspections and pollution prevention team training. She is additionally well-acquainted with local permitting processes, as well as conveying technical data and its ramifications to the public.

Project Specific Experience

Alaska Railroad Corporation Terminal Reserve Yard Phase II Assessment; Anchorage, Alaska Collaborated with the Alaska Railroad and Dowl HKM to conduct a Phase II site investigation of the Terminal Reserve Yard in preparation for an upgrade to the AWWU waterline. Project tasks included analyzing historical regional data to determine areas of highest likelihood of contamination, submitting work plan with proposed sampling locations to the ADEC for approval, and arranging all requiring trainings to perform work in railroad safety corridors. Worked with drillers to access locations best representing contamination in the area, field-screened soil boring intervals and submitted for laboratory analysis, installed temporary water monitoring wells and sampled groundwater for contaminants of concern. At the conclusion of field activities, laboratory data was used to recommend appropriate piping materials.

Chugach Electric Association Raspberry Substation Phase II Environmental Investigation Anchorage, Alaska Following the release of transformer oil, Ms. Forbes drafted and submitted a work plan to the ADEC to determine whether the contaminant had reached groundwater and potentially migrated to downgradient areas. Work plan included in-depth hydrogeology and waste characterization discussions. Oversaw the drilling of multiple locations, classified soils according to USCS classification, field-screened, and submitted samples for laboratory analysis. Determined that transformer oil had not migrated past the spill release area, and submitted final report to ADEC. Site was closed with institutional controls.

Johnson's Tire Service Phase I Site Investigation; Anchorage, Alaska Conducted a Phase I Environmental Site Assessment in accordance with ASTM standards for a Johnson's Tire Service branch on the southside of Anchorage to facilitate approval of a Small Business Administration Loan. The investigation revealed an unregistered underground

storage tank. Followed mandatory reporting requirements to the ADEC, and worked closely with business owners to navigate ADEC protocol. Phase I included recommendations to remove the tank and sample surrounding soil and groundwater for evidence of historic leaking.

Johnson's Tire Service Phase II Site Investigation; Anchorage, Alaska Submitted a work plan to the ADEC for the removal of an unregistered underground storage tank and sampling methodology for excavation of surrounding soils and dewatering of shallow groundwater. Created groundwater gradient maps and analyzed historic data to determine most representative locations for monitoring wells. Characterized investigative-derived waste and received ADEC approval for offsite treatment. Installed multiple groundwater monitoring wells on the subject property to determine the path of contentment migration, and conducted quarterly monitoring to ensure natural attenuation to close the site with the ADEC.

Alaska Railroad Corporation MI Swaco Phase I Investigation; Anchorage, Alaska Upon vacancy of a long-term ARRC lease property to MI Swaco for shipment of drilling materials, Ms. Forbes conducted a site investigation to determine the quality of the property for the owner. Indexed chemicals and materials used onsite for an evaluation of potential lasting risks to human health and the environment, conducted multiple personal interviews, assessed in-ground drainage systems and sewer, and made recommendations to the Railroad to ensure environmental compliance of the facility.

Lower Kuskokwim School District Kwethluk School Limited Phase I Site Assessment; Kwethluk, Alaska Conducted a limited Phase I investigation of three (3) properties located in Kwethluk, Alaska on behalf of Stantec Architects (formerly USKH) for the construction of a new school and demolition of former. Tasks included researching historical documents and photographs, speaking with applicable agencies and local representatives, and making recommendations to Stantec on how to proceed with project activities while minimizing environmental disturbances.

Lower Kuskokwim School District Kwethluk School Limited Phase II Site Assessment; Kwethluk, Alaska Performed all reporting of a limited surface soil investigation at two (2) Kwethluk properties identified in Phase I investigations. Included analysis of nearly 100 field-screening samples, and determination from laboratory results of areas of greatest concern during excavation activities.

Ted Stevens Anchorage International Airport Outfall APDES Monitoring; Anchorage, Alaska Worked closely with Airport engineers and ADEC Division of Water Quality regarding compliance with Airport APDES permit. On a monthly basis, conducted sampling of multiple outfalls discharging into Cook Inlet. Sampled surface water for multiple analytes, and compiled data over the course of one year. Project required synthesis of large quantities of data, correlation between field-screening and laboratory results, and making recommendations to stakeholders to minimize project costs while ensuring environmental protection through applicable permits.

Igiugig Village Tribal Council Environmental Assessments (Various), Igiugig Alaska Authored environmental assessments for local construction projects, including: private residences, Village Public Safety Officer headquarters, greenhouse and wind farm development, man-camp for Iliamna Lake Contractors, and a barge landing.

Port of Anchorage Storm System 3 Revitalization Project; Anchorage, Alaska Served as technical lead for environmental oversight during the removal and replacement of Storm System 3 buried piping infrastructure within the Port of Anchorage. Prepared a waste characterization and waste handling work plan outlining the known history of contaminant levels and sources, as well as multiple alternatives for the removal of project-generated water, including treatment and discharge into the AWWU sanitary sewer. The plans were submitted to and approved by the ADEC, and the Port of Anchorage elected to discharge to the AWWU sanitary sewer. Characterized highly fluidized sediments and contaminated groundwater, and oversaw the treatment of removed fluids through multiple sedimentation tanks and carbon filter trains until analytical results of samples taken from the water met Anchorage Municipal Standards for discharge into a sanitary sewer. Applied for and satisfied the terms of the AWWU Temporary Construction Water Discharge permit. Minimized the introduction of sediment and contaminated product into the sanitary sewer, and treated water was successfully discharged into the sanitary sewer system at levels in accordance with Anchorage Municipal Codes.

Attachment J: Conceptual Site Model

RESTORATION
Science & Engineering, LLC

Print Form

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: RAVN ANC
2100.38.558

Completed By: Restoration Science & Engineering
Date Completed: September 20, 2017

***Instructions*: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.**

(1) *Check the media that could be directly affected by the release.*

(2) *For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.*

(3) *Check all exposure media identified in (2).*

(4) *Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.*

(5) *Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.*

Current & Future Receptors

Media	Transport Mechanisms	Exposure Media	Exposure Pathway/Route	Residents (adults or children)	Commercial or industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
☑ Surface Soil (0-2 ft bgs)	☑ Direct release to surface soil — check soil	☑ soil	☑ Incidental Soil Ingestion		I		I			
	☑ Migration to subsurface — check soil		☑ Dermal Absorption of Contaminants from Soil		I		I			
	☐ Migration to groundwater — check groundwater		☐ Inhalation of Fugitive Dust							
	☑ Volatilization — check air									
	☐ Runoff or erosion — check surface water									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☑ Subsurface Soil (2-15 ft bgs)	☑ Direct release to subsurface soil — check soil	☐ groundwater	☐ Ingestion of Groundwater							
	☐ Migration to groundwater — check groundwater		☐ Dermal Absorption of Contaminants in Groundwater							
	☑ Volatilization — check air		☐ Inhalation of Volatile Compounds in Tap Water							
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Ground-water	☐ Direct release to groundwater — check groundwater	☑ air	☐ Inhalation of Outdoor Air		I		I			
	☐ Volatilization — check air		☐ Inhalation of Indoor Air							
	☐ Flow to surface water body — check surface water		☐ Inhalation of Fugitive Dust		I		I			
	☐ Flow to sediment — check sediment									
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Surface Water	☐ Direct release to surface water — check surface water	☐ surface water	☐ Ingestion of Surface Water							
	☐ Volatilization — check air		☐ Dermal Absorption of Contaminants in Surface Water							
	☐ Sedimentation — check sediment		☐ Inhalation of Volatile Compounds in Tap Water							
	☐ Uptake by plants or animals — check biota									
	☐ Other (list):									
☐ Sediment	☐ Direct release to sediment — check sediment	☐ sediment	☐ Direct Contact with Sediment							
	☐ Resuspension, runoff, or erosion — check surface water									
	☐ Uptake by plants or animals — check biota	☐ biota	☐ Ingestion of Wild or Farmed Foods							
	☐ Other (list):									

Revised, 10/01/2010

Attachment K: Response to Comments

RESTORATION
Science & Engineering, LLC

Alaska Department of Environmental Conservation (ADEC)
Contaminated Sites Program
Document Reviewed: Ravn Air ANC Site Characterization Report, dated July 2017 (DEC Rec. Key: 2100.38.558)
Commenter(s): Wendy Hansen-ADEC Project Manager
Date Submitted: August 31, 2017

#	Page #	Section	ADEC Comment	Response
1.	8	6.0 Paragraphs 1&3	Please check Figure references for boring and monitoring well locations.	RSE has updated figure references for boring and monitoring well locations throughout the document.
2.	10	6.3 Paragraph 3	Please note to what degree the wells recharged prior to sampling.	Wells recharged to within 20% of static levels initially measured prior to purging. RSE has added language to the referenced paragraph. Groundwater elevation data is included in Table 5, Attachment B.
3.	10	6.3 Table 5	The sample containers and holding times provided are for soils.	RSE has amended the table.
4.	11	7	Please provide updated status on soil cuttings and purge water.	The soil remains onsite as of September 2017. RSE has included an ADEC Approval to Transport form to the report to request transport and treatment of the soil at ASR. Purge water remains onsite as of September 2017. RSE requests discharging this water through a carbon filter to a vegetated area on site. RSE has added language to the referenced paragraph.
5.	13	9 Last Paragraph 1st Sentence	Data with method detection limits greater than ADEC cleanup levels does not appear to be flagged in the referenced data tables. It would be useful to have this information	Tables 3 and 7 have been updated to include the referenced highlighting.

			highlighted, as indicated.	
6.	13	9 Last Paragraph	The referenced Tables 6 and 7 are Quality Assurance Targets.	Text has been updated to reflect the appropriate table.
7.	14	10 Paragraph 2	Please correct all references to "320 Determination" to "18 AAC 75.350 Determination."	RSE has replaced the text with the Administrative Code reference.
8.		Attachment B Table 8	Results for RSE-2, -3, and –X should be presented in µg/L.	Units have been updated.
9.		Attachment F 4d.	For 4-bromofluorobenzene, criteria were no met due to matrix. For PAHs in water, surrogate terphenyl-d14 was affected due to matrix or sample dilution.	Laboratory Data Review Checklist has been updated.
10.			Please provide resume for QEP, Andy Forbes.	Arran Forbes' resume has been included as Attachment I.
11.		Excerpted from ADEC email 8/31/17	… would like to discuss observations in the top 2 feet of soil and comparing results to Method 2 Human Health cleanup levels. Based on Table 4, benzo(a)pyrene exceeds Method 2 Human Health in both PAH soil samples.	RSE has added text addressing Human Health Method 2 levels on pages 14 and 15 of the report, within discussion of the CSM.
12.		ADEC Phone Conversation 9/5/17	Provide an updated CSM.	RSE has provided an updated CSM as Attachment J to the report.
13.			**End of ADEC Comments**	