

2355 Hill Road Fairbanks, Alaska 99709-5326 (907) 479-0600 FAX: 479-5691

E-mail: tal@shanwil.com

# **Transmittal**

Petro Star, Inc.		Attn:	Lisa Lewis
3900 C Street, Su	nite 802	Date:	July 10, 2014
Anchorage, Alasi	ka 99503	Project:	ULSD Release Final Report
nic Copies To:	Robert Burgess (ADEC	)	
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		ional Soil and Groi	undwater Characterization, Petro Star
		ional Soil and Groi	undwater Characterization, Petro Star
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	3900 C Street, Sur Anchorage, Alash nic Copies To: nclosed the following PDF Format Refinery, No Hard Copies	3900 C Street, Suite 802 Anchorage, Alaska 99503  nic Copies To: Robert Burgess (ADEC nclosed the following items:  PDF Format ULSD Release, Addit Refinery, North Pole, Alaska Hard Copies ULSD Release, Addit Refinery, North Pole, Alaska  transmitted by:  E-mail □ USPS	Anchorage, Alaska 99503 Project:  Anchorage, Alaska 99503 Project:  Inic Copies To: Robert Burgess (ADEC)  Inclosed the following items:  Description  PDF Format ULSD Release, Additional Soil and Grown Refinery, North Pole, Alaska  Hard Copies ULSD Release, Additional Soil and Grown Refinery, North Pole, Alaska  Hard Copies ULSD Release, Additional Soil and Grown Refinery, North Pole, Alaska  Transmitted by:  E-mail USPS □Courier

By: Trevelyn Lough

Title: Geologist



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July 10, 2014

Petro Star, Inc. 3900 C Street, Suite 802 Anchorage, AK 99503

Attn: Ms. Lisa Lewis

RE: ULSD RELEASE, ADDITIONAL SOIL AND GROUNDWATER CHARACTERIZATION, PETRO STAR REFINERY, NORTH POLE, ALASKA

We have completed our additional site-characterization activities for the October 22, 2010 ultra-low-sulfur diesel (ULSD) release that occurred at the Petro Star refinery at 1200 H&H Road in North Pole, Alaska (Figure 1). This work was performed in accordance with Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Regulations (18 AAC 75), our October 2010 ULSD Release *Work Plan*, and our June 19, 2013 proposal for additional soil and groundwater characterization downgradient of the release. Our project objective was to further delineate the horizontal extent of impacted subsurface-soil and groundwater hydrologically downgradient of the spill site (Figure 2).

### **BACKGROUND**

A gasket failure near the FSSI building at the refinery resulted in the release of approximately 1,400 gallons of ULSD. The spill filled a containment structure and overflowed to the adjacent ground surface. The estimated spill area was approximately 60 feet long by 12 feet wide. From October 22 through 25, 2010 Emerald Alaska, Inc. (Emerald) conducted initial spill-response actions and removed approximately 50 cubic yards of contaminated soils from the affected area. Nearby structures, flow lines, and/or electrical conduits to the north and west of the impacted area limited lateral and vertical excavation. Excavated soils were temporarily stockpiled on-site prior to treatment at OIT, Inc. by thermal desorption.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 2 of 12

Our previous efforts at this site included preparation and implementation of an October 2010 ULSD Release *Work Plan*. Our scope included the following: collecting field-screening and analytical soil samples from excavation limits; installing and developing three monitoring wells hydrologically downgradient of the spill site; collecting field-screening and analytical soil samples during well installation; collecting one groundwater sample from each well; and summarizing field observations, analytical results, conclusions, and recommendations in a July 2012 summary report titled *ULSD Release Response Report*. We summarize our findings below.

The area impacted by the spill was excavated to a depth of 3 feet below ground surface (bgs). Analytical soil-sample results from the limits of the excavation contained concentrations of DRO, GRO, benzene, ethylbenzene, total xylenes, and 1,2,4-trimethylbenzene above ADEC migration-to-groundwater cleanup levels.

Shannon & Wilson installed three monitoring wells downgradient of the ULSD spill site. Monitoring wells MW10-01 and MW10-02 were installed adjacent to the northwestern edge of the product pumps, and monitoring well MW10-03 was installed an additional 75 feet northwest (Figure 3). Analytical soil samples collected during monitoring well installation indicated DRO was present above the ADEC migration-to-groundwater cleanup level in the 5-foot bgs to 6.5-foot bgs interval at monitoring well MW10-01 and in the 7.5-foot bgs to 9.0-foot bgs interval at monitoring well MW10-02. Analytical groundwater results collected from monitoring wells MW10-01 and MW10-03 did not exceed ADEC groundwater-cleanup levels, and monitoring well MW10-02 was not sampled due to the presence of free product on the water table.

Based on our observation and analytical soil- and groundwater-sample results, we concluded subsurface-soil contamination was present above ADEC cleanup levels at the excavation limits and northwest of the ULSD spill excavation. Additionally, soil contamination had impacted groundwater in the vicinity of monitoring well MW10-02 and existed in above migration-to-groundwater levels at MW10-01. On June 19, 2013, we proposed additional soil and groundwater sampling downgradient of the release to further characterize the limits of subsurface-soil and groundwater contamination. We performed this work in the summer of 2013 and detail our findings below.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 3 of 12

### SAMPLING AND OBSERVATIONS

On July 28, 2013, Shannon & Wilson advanced and sampled four soil borings and well points downgradient of the ULSD-release source area to further assess the horizontal extent of petroleum-impacted soil and groundwater. In addition, we collected one groundwater sample from each of the three existing monitoring wells (monitoring wells MW10-01, MW10-02, and MW10-03) at the site. We retained the services of GeoTek Alaska, Inc. (GeoTek) to perform soil sampling and install temporary well points using a Geoprobe® direct-push, track-mounted drill rig (Geoprobe). Soil-boring, well-point, and monitoring-well locations are shown in Figure 4.

Shannon & Wilson personnel performed field activities and handled analytical and quality control samples in accordance with our ADEC-approved October 2010 *Work Plan* and the ADEC 2010 *Draft Field Sampling Guidance*.

## **Soil Borings**

GeoTek advanced soil borings with a Geoprobe equipped with a Macro-Core® (MC) tooling system, which retrieved continuous soil cores in 5-foot-long, 1.75-inch-diameter, PVC sample tubes. Seth Robinson, a Geologist with our Fairbanks office, field-screened soil samples using a photoionization detector (PID) to select appropriate samples for laboratory analysis, collected soil samples for analytical testing, and visually classified soil cores.

We advanced and logged each boring until we encountered groundwater-saturated soil, which was between 6.5 and 8.1 feet bgs. If we encountered groundwater-saturated soil in the bottom half of a sample tube, we logged and field screened soil from one additional 5-foot sample interval. Total boring depths ranged from 10 feet bgs in soil borings SB13-03 and SB13-04 to 15 feet bgs in soil borings SB13-01 and SB13-02. We present soil boring logs as Figures 5 through 8 and summarize subsurface conditions below:

• Subsurface-soil conditions were generally 3.0 feet to 4.4 feet of sandy fill with trace to some (0 percent to 45 percent by mass) gravel and trace to few (0 percent to 10 percent by mass) silt. The fill was overlying 3.3 feet to 12 feet of intercalated 3.3-foot- to 12-foot-thick lenses of olive gray to olive brown, sand with trace (0 percent to 5 percent by mass) silt and 2.5-foot- to 7.6-foot thick lenses of olive gray to olive, sand with some (30 percent to 45 percent by mass) gravel and trace (0 percent to 5 percent by mass) silt.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 4 of 12

- At the base of soil boring SB13-01, we encountered 2.0 feet of olive gray, sand with some (30 percent to 45 percent by mass) gravel and few (5 percent to 10 percent by mass) silt underlying the intercalated sands and gravelly sands.
- At the top of soil boring SB13-02, we encountered 0.3 feet of olive brown, gravelly fill with few (5 percent to 10 percent by mass) sands and trace (0 percent to 5 percent by mass) silt overlying the uppermost layer of sandy fill.
- At the base of soil boring SB13-03, we encountered 3.5 feet of olive gray, silty sand with little (15 percent to 25 percent by mass) gravel underlying the intercalated sands and gravelly sands.
- Soil did not exhibit an odor or petroleum-hydrocarbon sheen.

PID field-screening results ranged from 0 parts per million (ppm) to 0.9 ppm; therefore, in accordance with our proposal, we collected one analytical soil sample from the 1-foot to 2-foot interval spanning the water table at each soil boring. We submitted four analytical soil samples and one field duplicate to SGS North America Inc. (SGS) in Fairbanks, an ADEC-approved analytical laboratory, for the following analyses: GRO by Alaska Method AK101; benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B; and DRO by Alaska Method AK102. In accordance with our July 2013 proposal, we did not submit a sample to be analyzed for polycyclic aromatic hydrocarbons (PAH) because we did not encounter indications of contamination (i.e., elevated PID readings, hydrocarbon odor, oily sheen) within the borings.

### **Well Points**

GeoTek installed a temporary well point inside each completed soil boring using a Geoprobe equipped with a Screen Point (SP) 16 groundwater sampling system. The well points were constructed of a 1.0-inch outside diameter steel casing with a 41-inch-long screened interval set to span the water table. Erica Blake, a geologist with our Fairbanks office, purged and sampled the temporary well points.

Prior to collecting analytical groundwater samples, Shannon & Wilson measured static groundwater level within each well point by deploying a depth to water (DTW) probe down the temporary well. DTW measurements ranged from 3.18 feet to 6.47 feet bgs. We purged each point with a peristaltic pump set to a low flow rate until groundwater parameters stabilized or

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 5 of 12

three well volumes were removed. Sampling personnel did not observe hydrocarbon sheen or odor on purge water. Following purging, we collected samples into laboratory-provided sample containers.

Once sampling was completed at each well point, GeoTek personnel removed the SP tooling and backfilled the boring with a bentonite seal above the water table and a minimum of 2 feet thick, excess soil not selected for analytical testing, and an asphalt patch, if needed. We submitted groundwater samples to SGS for analysis of GRO by AK Method 101, DRO by AK Method 102, and BTEX by EPA Method SW8260B.

### **Monitoring-Well Sampling**

Prior to collecting analytical groundwater samples from monitoring wells, Shannon & Wilson personnel measured product thickness (if present) and depth to groundwater with an oil/water interface probe. Erika Blake and Seth Robinson purged and sampled monitoring wells with a 12-volt, battery-powered submersible pump. DTW ranged from 5.03 feet bgs in monitoring well MW10-01 to 5.14 feet bgs at monitoring well MW10-03. A 0.2-foot-thick layer of product was present on the water table in monitoring well MW10-01. Product was not detected in monitoring wells MW10-02 and MW10-03, and field personnel did not observe a hydrocarbon odor or oily sheen on purge water from these locations.

Shannon & Wilson submitted groundwater samples from monitoring wells MW10-02 and MW10-03 to SGS for analysis of GRO, DRO, and BTEX by the methods described above. A groundwater sample was not collected from monitoring well MW10-01 due to the presence of free product on the water table.

# **Investigation-Derived Waste (IDW)**

Soil field-screening results did not exceed 20 ppm; therefore, Shannon & Wilson spread excess soil not used as soil-boring backfill and not selected for laboratory analysis on the ground surface at each boring location, as per our June 2013 proposal.

We routed purge and decontamination water into the on-site oil/water separator drain. Other IDW, consisting of disposable sampling equipment (e.g., nitrile gloves and pump tubing), was disposed of at the Fairbanks North Star Borough landfill.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 6 of 12

### **Deviations from Work Plan**

The investigative work summarized in this report was completed in general accordance with the October 2010 *Work Plan* and our June 19, 2013 proposal with the exception of the following deviation: due to the presence of measurable product on the water table at monitoring well MW10-01, Shannon & Wilson did not collect a groundwater sample from this location. In our opinion, the above work-plan deviation did not affect our ability to complete our project scope or objective.

## **RESULTS**

The laboratory analytical report and ADEC Laboratory Data-Review Checklists for the soil and groundwater samples are included as attachments to this report. Analytical results for soil and groundwater are presented as Table 1 and Table 2, respectively. We compared soil sample results to Alaska's 18 AAC 75.341 Tables B1 and B2, Method Two – Soil Cleanup Level for Migration to Groundwater for the "Under 40 Inch Zone" and groundwater sample results to the cleanup levels listed in 18 AAC 75.345 Table C – Groundwater Cleanup Levels.

### **Soil Samples**

We summarize soil-sample analytical results in Table 1. Analytes were not detected above their limits of quantitation (LOQs) in soil samples. SGS detected DRO at estimated concentrations below the LOQ of 12.4J milligrams per kilogram (mg/kg), 21.5J mg/kg, and 6.96J mg/kg in samples SB-13-03(5.6-6.5), SB-13-04(5.25-6.5), and the SB-13-04(5.25-6.5) field duplicate, sample SB-23-04(5.25-6.5), respectively. SGS also detected GRO at estimated concentrations below the LOQ in each soil sample; however, these detections are attributable to laboratory contamination, and we consider these GRO results to be non detect at the LOQ; see the Quality Assurance/Quality Control (QA/QC) section for details. Other analytes were not detected in soil samples.

# **Groundwater Samples**

Groundwater-sample analytical results from well points and groundwater monitoring wells are summarized in Table 2. SGS detected GRO at estimated concentrations below the LOQ in samples SB-13-01 and SB-13-03 at concentrations of 0.0369J milligrams per liter (mg/L) and

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 7 of 12

0.0359J mg/L, respectively. Sample SB-13-03 had an estimated DRO detection of 0.235J mg/L and an estimate benzene detection of 0.270J micrograms per liter (µg/L). Sample MW-10-03 had estimated o-xylene and p&m-xylene detections of 0.350J µg/L and 0.720 µg/L, respectively. Benzene was detected above the LOQ, but below the cleanup level in sample SB-13-04 at a concentration of 0.720 µg/L and above the cleanup level in the MW-10-02/MW-10-12 field-duplicate sample pair. GRO, DRO, ethylbenzene, total xylenes, and toluene were detected above their LOQs, but below their cleanup levels in the MW-10-02/MW-10-12 field-duplicate sample pair. SGS noted the DRO chromatogram pattern was consistent with weathered gasoline in the MW-10-02/MW-10-12 field-duplicate sample pair. Other analytes were not detected in groundwater samples.

# QUALITY ASSURANCE/QUALITY CONTROL

QA/QC procedures assist in producing data of acceptable quality and reliability. We reviewed the analytical results provided by SGS for laboratory QC samples and also conducted our own QA assessment for this project. We reviewed chain of custody (COC) records and laboratory sample-receipt forms to check that we followed proper custody procedures, met sample holding times, and kept samples properly chilled (between 0 degrees Celsius [°C] and 6 °C) during shipping. Our QA-review procedures allow us to document accuracy and precision of the analytical data and check that the analyses were sufficiently sensitive to detect analytes at levels below regulatory standards.

For this report, we reviewed the soil and groundwater data report for SGS work order (WO) 1138165. The SGS laboratory report includes the case narrative, sample-receipt forms, and completed ADEC data-review checklists are attached. Details regarding the results of our QA analysis are presented below. The laboratory reports and ADEC data-review checklists are included as attachments.

# **Sample Handling**

We hand-delivered two sample coolers containing samples from WO 1138165 to the SGS Fairbanks sample-receiving facility on July 29, 2013. Each cooler also contained a temperature blank. In addition, one soil trip blank and one water trip blank was transported in each cooler containing sample jars for VOC analyses of the appropriate matrix. SGS then shipped the

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 8 of 12

samples to their Anchorage laboratory to perform analyses by methods specified on the COC records. SGS personnel measured the cooler's temperature blank at the time the samples arrived at their facilities; the temperature blanks were within the proper temperature range upon submittal in Fairbanks and arrival at the SGS Anchorage laboratory.

Our review of COC records and laboratory sample-receipt documents did not reveal sample-handling anomalies that would affect the quality or usability of the data, and SGS processed the samples within the appropriate sample-holding times. Shannon & Wilson requested five sample names be changed via email after samples were delivered to SGS.

## **Analytical Sensitivity**

We compared soil-sample limit of detections (LODs) to ADEC tables B1 and B2 migration to groundwater cleanup levels for the "Under 40 in Zone" and groundwater-sample LODs to ADEC Table C groundwater-cleanup levels. LODs were below ADEC-established cleanup levels, where applicable (for non-detect results).

We submitted trip blanks with soil and water samples to be analyzed for volatile constituents (GRO and BTEX) to determine if cross-contamination among samples or contamination from an outside source may have occurred during shipment or storage. Analytes were not detected in the water trip blank. However, GRO was detected at an estimated concentration of 0.986J mg/kg in the soil trip blank. This concentration is within five times the amount found in an associated method blank detection; therefore, we consider the GRO trip-blank attributable to laboratory handling rather than sample cross-contamination.

SGS detected GRO in two soil method blanks at estimated concentrations below the LOQ of 1.63J mg/kg in prep batch VXX25017 and 1.09J mg/kg in prep batch VXX25022. Project samples analyzed in the above prep batches had estimated GRO detections below the LOQ and within 5 times the concentrations found in the method blanks; therefore, we consider associated project sample results to be non-detect at the LOQ, flagged with a 'UB'. The following samples are considered affected: SB13-01(7.1-8.1), SB13-02(6.25-7.5), SB13-03(5.6-6.5), SB23-04(5.25-6.5) and the soil trip blank. Analytes were not detected in other method blanks associated with project samples.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 9 of 12

### Accuracy

The laboratory assessed the accuracy of its analytical procedures by analyzing laboratory control samples (LCSs), LCS duplicates (LCSDs), matrix spikes (MS) and matrix spike duplicates (MSDs). LCS/LCSD analysis allow the laboratory to evaluate their ability to recover analytes added to clean aqueous matrices, while MS/MSD analysis allows them to evaluate their ability to recover analytes from matrices similar to those of project samples. LCS/LCSD samples were reported for GRO, DRO, and some BTEX results. In cases where only the LCS was reported for BTEX analysis, a MS/MSD sample set was also analyzed. Laboratory accuracy was also measured for each sample by assessing the recovery of analyte surrogates added to individual project samples.

The LCS/LCSD, MS/MSD, and surrogate recovery data are within lab control limits and results are accurate.

### **Precision**

To evaluate data precision and reproducibility of our sampling techniques, we calculated the relative percent difference (RPD) of duplicate results. RPD is defined as the difference between the sample and its duplicate divided by the mean of the two. We can only evaluate RPDs if the results of the analysis for both the sample and its duplicate are greater than the LOQs for a given analyte. We collected one soil and one groundwater duplicate sample at a frequency greater than 10 percent of the total number of project samples. For soil samples, we collected duplicate sample pair SB13-04(7.1-8.1) and SB23-04(7.1-8.1). We also collected duplicate groundwater sample pair MW10-02 and MW10-12. RPDs, where calculable, are reported as less than the ADEC-recommended RPD limits.

We also evaluated laboratory analytical precision by RPD calculations. The MS/MSDs and LCS/LCSDs provide information regarding the reproducibility of laboratory procedures, and are therefore a measure of the laboratory's analytical precision. MS/MSD and LCS/LCSDs RPDs were within QC goals and laboratory-control limits.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 10 of 12

### **Data Quality Summary**

By working in accordance with our proposed scope of services, we consider the samples we collected to be representative of site conditions at the locations and times they were obtained. Based on our QA review, no samples were rejected as unusable due to QC failures. For this project, the quality of the analytical data does not appear to have been compromised by analytical irregularities, and results affected by QC anomalies are qualified with appropriate flags.

### CONCLUSIONS AND RECOMMENDATIONS

Based on our observations, field screening, and analytical results of soil and groundwater, Shannon & Wilson presents the following conclusion:

### Soil

The samples collected from four soil borings installed as part of this project did not contain analytes in exceedance of applicable cleanup levels (Figure 4; Table 1). The extent of subsurface-soil contamination from the ULSD release appears restricted to the area adjacent to the FSSI Building.

### Groundwater

Groundwater samples collected from the temporary well points did not contain analytes in exceedance of ADEC cleanup levels (Figure 4; Table 2).

SGS detected GRO, DRO, ethylbenzene, total xylenes, and toluene at concentrations less than cleanup levels and benzene at a concentration exceeding its cleanup level in the MW-10-02 /MW-10-12 sample duplicate pair. Other analytes were not detected above cleanup levels in analytical groundwater monitoring-well samples (Figure 4; Table 2).

We conclude that the ULSD release has not affected groundwater quality in the area of the well points and MW10-03 at the time of sampling. The presence of free product on the water table in monitoring well MW10-01 and benzene in exceedance of cleanup levels in MW10-02 indicate impacted groundwater exists adjacent to the northwestern edge of the release area.

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 11 of 12

Shannon & Wilson recommends that Petro Star personnel continue to regularly gauge and remove light nonaqueous phase liquid (LNAPL), if present, from monitoring wells MW10-01 through MW10-03. In addition, we recommend collecting analytical groundwater samples for analysis of GRO, DRO, and BTEX from the existing monitoring-well network annually for three years to evaluate trends, if any, in contaminant concentration adjacent to the release area and to confirm that impacted groundwater is not migrating downgradient of the release.

### LIMITATIONS

The data presented in this letter report are based on the scope of our services and the sampling and analysis we performed. The data presented herein should be considered representative only of the time of our sampling and not as a definite statement regarding reported conditions. They should not be construed as definite conclusions about the soil or water quality at the site; changes due to natural forces or human activity can occur on the site. We have prepared the attachment "Important Information about Your Environmental Report," to help you and others understand the use and limitations of our reports.

This report was prepared for the exclusive use of our client and their representatives. All documents prepared by Shannon & Wilson are instruments of service with respect to the project for the sole use of our client. Only our client shall have the right to rely upon such documents. Such documents are not intended or represented to be suitable for reuse by our client or others after the passage of time, on extensions of the project, or any other project. Any such reuse without written verification or adaptation by Shannon & Wilson, as appropriate for the specific purpose intended, shall be at the user's sole risk.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) signed or sealed by Shannon & Wilson. Text, data, or graphics files in electronic media format are furnished solely for the convenience of our client. Any conclusion or information obtained or derived from such electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

Because data stored in electronic media can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the client should perform acceptance tests or procedures within 60 days after its receipt, after which, unless notice of any errors are given in

Petro Star, Inc. Ms. Lisa Lewis July 10, 2014 Page 12 of 12

writing to Shannon & Wilson, the client shall be deemed to have accepted the data thus transferred. Any errors reported within the 60-day acceptance period shall be corrected by Shannon & Wilson. Shannon & Wilson shall not be responsible for maintaining documents stored in electronic media format after acceptance by the client.

When transferring documents in electronic media format, Shannon & Wilson does not make any representations as to long-term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used for the document's creation.

If you have any questions regarding this report, please call us at (907) 479-0600.

Sincerely,

SHANNON & WILSON, INC.

Seth Robinson

Geologist

Mark Lockwood, C.P.G.

Senior Associate

Enc: Table 1 – Soil-Sample Analytical Results Summary

Table 2 – Groundwater-Sample Analytical Results Summary

Figure 1 - Vicinity Map

Figure 2 - Site Map

Figure 3 – Monitoring Well Locations

Figure 4 – Monitoring Well and Soil Boring/Well Point Locations

Figures 5 through 8 - Soil Boring/Well Point Logs

SGS Analytical Laboratory Reports

ADEC Laboratory Data-Review Checklists

Important Information about Your Geotechnical/Environmental Report

# TABLE 1 SOIL-SAMPLE ANALYTICAL RESULTS SUMMARY

Sample Number	Sample Location	Sample Depth (ft bgs)	GRO (mg/kg)	DRO (mg/kg)	Benzene (mg/kg)	Ethylbenzene (mg/kg)	o-Xylene (mg/kg)	Xylene (mg/kg)	Xylenes (mg/kg)	Toluene (mg/kg)
SB-13-01(7.1-8.1)	SB13-01	7.1 - 8.1	<1.54 B*	<13.7	< 0.00482	< 0.00964	< 0.00964	< 0.0185	< 0.0281	< 0.00964
SB-13-02(6.25-7.5)	SB13-02	6.25 - 7.5	<2.84 B*	<15.2	<0.00888	< 0.0177	< 0.0177	< 0.0342	< 0.0519	< 0.0177
SB-13-03(5.6-6.5)	SB13-03	5.6 - 6.5	<2.49 B*	12.4J	< 0.00778	< 0.0156	< 0.0156	< 0.0300	< 0.0456	< 0.0156
SB-13-04(5.25-6.5)	SB13-04	7.1 - 8.1	<2.26 B*	21.5J	< 0.00706	< 0.0141	< 0.0141	< 0.0272	< 0.0413	< 0.0141
SB-23-04(5.25-6.5)`	SB13-04	7.1 - 8.1	<2.13 B*	6.96J	< 0.00664	< 0.0133	< 0.0133	< 0.0256	< 0.0389	< 0.0133
ADEC Soil-Cleanup Le	vel^		300	250	0.025	6.9			63	6.5

### Notes:

- ' Quality-control field-duplicate sample
- ^ ADEC Soil-Cleanup Levels from 18 AAC 75.341 Tables B1 and B2, Method Two Migration to Groundwater for the "Under 40 Inch Zone"
- GRO Gasoline range organics
- DRO Diesel range organics
- mg/kg Milligram per kilogram
  - bgs Below ground surface
  - < Analyte not detected; displayed <li>init of detection (LOD)
  - -- Cleanup level not applicable
  - J Value is an estimated concentration, detected above detection limit, but below limit of quantificaton (LOQ)
  - $B^*$  Result is considered not detected at the LOQ or reported concentration (higher value) due to contamination identified in a method blank; displayed  $< ... B^*$
  - ft Feet

# TABLE 2 GROUNDWATER-SAMPLE ANALYTICAL RESULTS SUMMARY

Sample Number	Sample Location	GRO (mg/L)	DRO (mg/L)	Benzene (µg/L)	Ethylbenzene (µg/L)	o-Xylene (µg/L)	P & M Xylene (µg/L)	Total Xylene (µg/L)	Toluene (µg/L)
MW-10-02	MW10-02	1.71	0.721	10.5	61.6	113	218	331	56.8
MW-10-12'	MW10-02	1.62	0.890	9.69	59.0	110	216	326	64.7
MW-10-03	MW10-03	< 0.0620	< 0.376	< 0.240	< 0.620	0.350J	0.720J	1.07J	< 0.620
SB-13-01	SB13-01	0.0369J	< 0.370	< 0.240	< 0.620	< 0.620	<1.24	<1.86	< 0.620
SB-13-02	SB13-02	< 0.0620	< 0.360	< 0.240	< 0.620	< 0.620	<1.24	<1.86	< 0.620
SB-13-03	SB13-03	0.0359J	0.235J	0.270J	< 0.620	< 0.620	<1.24	<1.86	< 0.620
SB-13-04	SB13-04	< 0.0620	< 0.360	0.720	< 0.620	< 0.620	<1.24	<1.86	< 0.620
ADEC Groundwater	-Cleanup Level^	2.2	1.5	5	700			1,000	1,000

### Notes:

Quality-control field-duplicate sample

^ ADEC Groundwater-Cleanup Levels from 18AAC 75.345 Table C - Groundwater Cleanup Levels

GRO Gasoline range organics

DRO Diesel range organics

mg/L Milligram per liter

μg/L Micrograms per liter

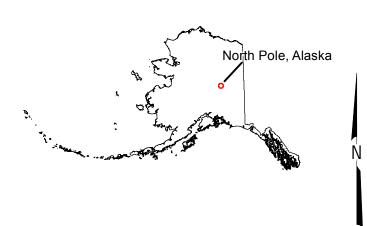
< Analyte not detected, displayed <Limit of Detection (LOD)

-- Cleanup level not applicable

**bold** Result exceeds ADEC Groundwater Cleanup Level

J Value is an estimated concentration, above Detection Limit (DL) and the Limit of Quantitation (LOQ)





Imagery provided by Pictometry International 2012

0 1

Miles

Additional Site Characterization - ULSD Release Petro Star Refinery North Pole, Alaska

# **VICINITY MAP**

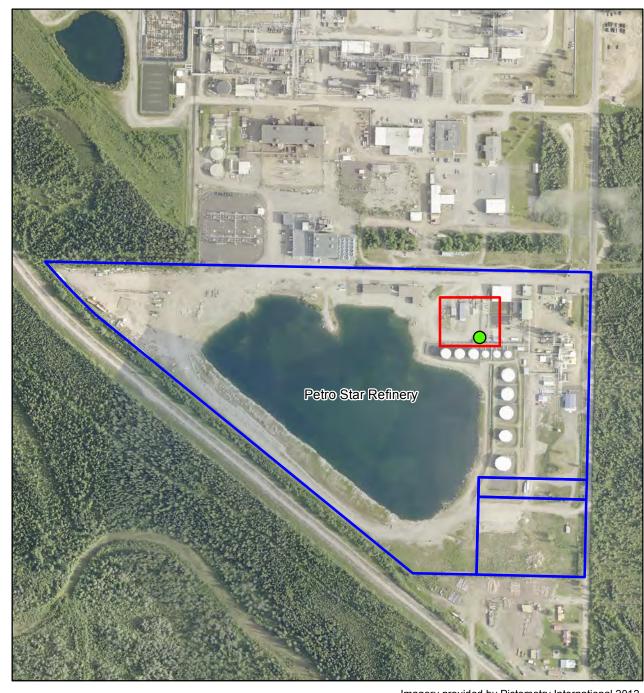
July 2014

31-1-11551-005

SHANNON & WILSON, INC.

GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 1





**Property Boundary** 

Area of Additional Site Characterization

Approximae Release Point

Imagery provided by Pictometry International 2012 500 Feet

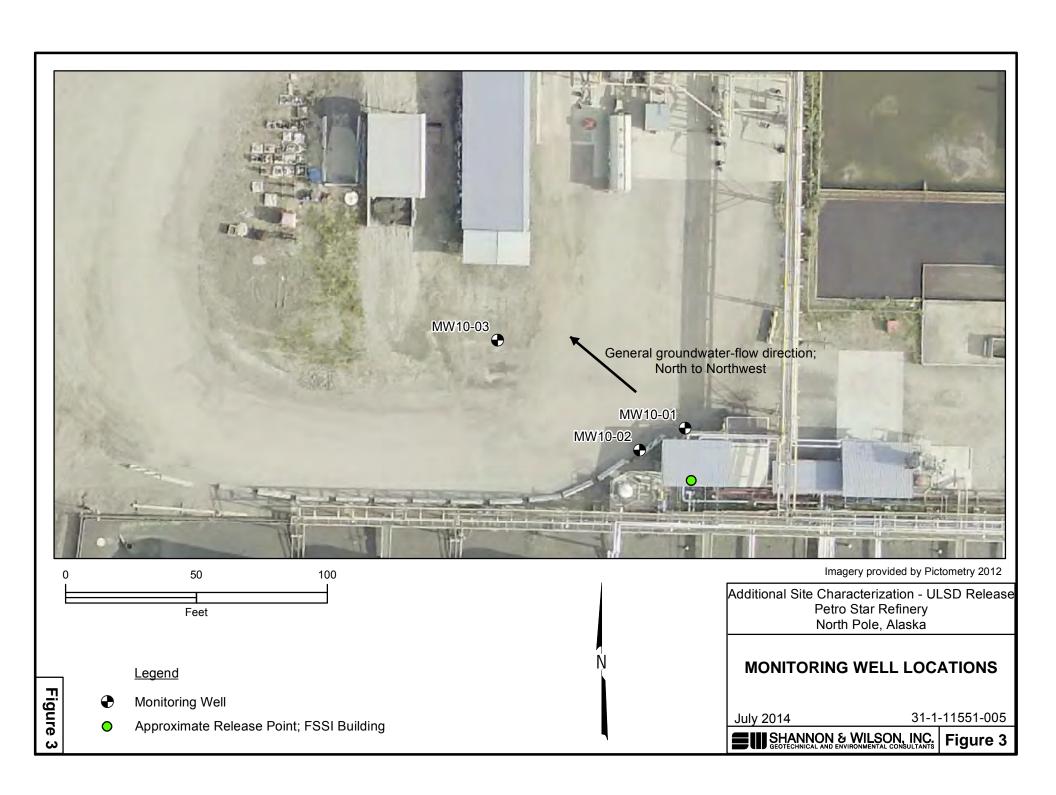
Additional Site Characterization - ULSD Release Petro Star Refinery North Pole, Alaska

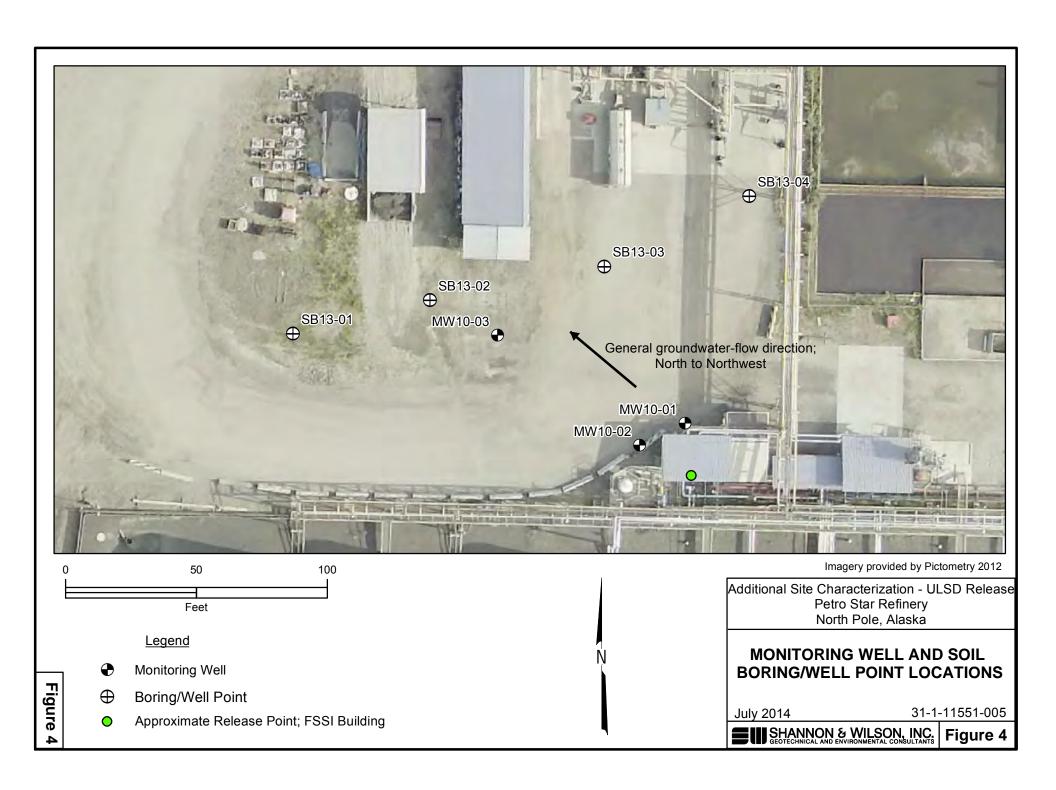
# **SITE MAP**

July 2014

31-1-11551-005

SHANNON & WILSON, INC. Figure 2





	LOG OF GEOPROBE														
Date	Started	7/28/13	Location					C	Ground	d Ele	eva	tion:	(Not Mea	sured)	
	Completed	7/28/13						1	Гуріса	l Ru	n L	engtl	n 5 feet		
Total	Depth (ft)	15.0	Drilling Co	ompany: Ge	eoTek Alaska, l	Inc.		F	lole D	iam			2 inches		
Depth (ft)	and pro appro	bing method ximate boun	Soil l ext for a prope ds. The strati daries betwe	Descript or understand fication lines en soil types		face materials represent the ries may be		Depth, ft.	Symbol	PID, ppm	Groundwater	Well Construction	Sample	Number	Depth (ft)
21-2047.6PJ6/18/14	coarse, si subangula (Fill) Olive brov (SP-SM); gravel; fin (Fill) Olive gray moist at 7 to subrou subround Flood-pla Olive gray subangula Flood-pla Olive gray	wn to olive, y to olive, y to olive, y feet, w nded grav ed sand; in alluvium y, Poorly to ocoarse, o subangu in alluvium	r to subrour ounded same (Qal)  Graded Same (Qal)	anded gradend; trace orly Grade Sarand (SP); and trace and with So subanging	wet; fine to me silt.  Silt and Grave gravel; fire probe	Silt brounded sand.  I (SP); dry to subangular o		12.0 13.0		0 0 0 0 0 0 0	Δ		SB-13-01 (7	.1-8.1)	5—
TAL.GPJ	NOTES  1. In some cases where recovery was low in the upper part of the run, the soil sample may have slid down in the tube prior to removal from the ground.  2. Temporary well points were removed once sampling activites were completed.  LEGEND  Ground Water Level at Time of Wellpoint Screen  Wellpoint Screen  Wellpoint Riser  A Groundwater sample depth offset from true depth due to symbol overlap  Analytical Groundwater Sample  Analytical Soil Sample					en					Pe	etro S orth F	Star Refiner Pole, Alaska	1	ase
WELL PE						al Collapse or		<b>L</b> July :		OF	₹ (	SEC	PROBE 3	<b>SB13-01</b> 1-1-11551-0	05
SEOPROBE										N 8	k W	/ILS	ON, INC.	FIG. 5	

	LOG OF GEOPROBE															
Date	Started	7/28/13	Loca	ation					(	Groun	d Ele	eva	tion:	(Not Mea	sured)	
Date	Completed	7/28/13								Туріса	I Ru	n L	ength	1 <i>5 f</i> eet		
Tota	Depth (ft)	15.0	Drilli	ing Com	pany: Ge	eoTek Alası	ka, Inc.		I	Hole D	iame	etei	:	2 inches		
Depth (ft)	and pr	obing method oximate bour	ext for a ds. The ndaries	Soil De proper un stratifica between	escripti nderstand ation lines soil types	i <b>on</b> ling of the sui indicated bei	bsurface mater low represent t ndaries may be	he	Depth, ft.	Symbol	PID, ppm	Groundwater	Well Construction	Sample	Number	Depth (ft)
g: SYR Rev: TAL Typ: LKN	subangu subangu (Fill) Olive gra Gravel (fill) Olive bro moist be angular to subround	lar to subrar to subrar to subrar to subrar to olive of the to med own to olive own to olive of the subrounded sand; ain alluvium	brownd dry; findium, every graded (control of the control of the c	ed graved and an	rel; 10% d; trace  ly Grade edium, s ular to s  ly Grade 7.5 fee fine to r	of fine to make silt.  Sed Sand value subrounder subrounder sed Sand (et; trace fine medium, sed subrounder sed Sand (et; trace fine sed subrounder sed	vith Silt and	nded e,	- 3.0		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	₹		SB-13-02 (6	.25-7.5)	5—
TAL.GPJ 21-20447.GPJ 6/18/14 Log:	of Wellpoint Groundwat	down in the to points were r ter Level at <sup>-</sup>	very was ube prior remove Time depth of symbo	NOTES Now in the or to remode once sa LEGENE	Se upper paval from the impling acc	art of the run, ne ground. tivites were c Wellpoint F Backfill, Na Soil Cutting Backfill, Be	ompleted.  Screen Riser atural Collapse	e or	L			Pe	tro S orth F	Star Refiner Pole, Alaska PROBE		
EOPROE	Analytical Groundwater Sample Analytical Soil Sample						SHA Geoted	NNO chnical ar	N 8	k <b>V</b>	/ILS(	ON, INC.	FIG. 6			

	LOG OF GEOPROBE														
Date	Started	7/28/13	Location					Gro	ound	d Ele	eva	tion:	(Not Mea	sured)	
Date	Completed	7/28/13						Тур	pical	l Ru	n L	ength	า <i>5 f</i> eet		
Tota	I Depth (ft)	10.0	Drilling Co	ompany: G	eoTek Alaska,	Inc.		Но	le Di	iam	etei	r:	2 inches		
Depth (ft)	and p	robing method roximate boun	Soil lext for a prope ds. The strati daries betwe	Descript or understand fication lines en soil types		face materials represent the ries may be	Denth #	Ceptii, it.	Symbol	PID, ppm	Groundwater	Well Construction	Sample	Number	Depth (ft)
21-2047.GPJ 6/18/14	dry; fine medium (Fill)  Olive brofeet; fine Flood-pl  Olive grasubangu subroun Flood-pl	own to oliv to coarse, , subangul own, <i>Poorl</i> e to mediur ain alluviur ay, <i>Silty Sa</i> ular to subr ded sand. ain alluviur	angular to ar to subro ar to subang m (Qal)  and with Grounded	Sand (SF ular to su	ded gravel; fi and; trace silt ?); dry to mois brounded san f); wet; fine to to medium, s	t below 4.7 nd; trace silt.	0.3 3.2 6.5			0.3 0.4 0.3 0.1 0.3 0.2	Ž		SB-13-03 (5	.6-6.5)	10 —
TAL.GPJ	may have slid	down in the tu	ery was low in ube prior to re	moval from t sampling ac	art of the run, the he ground. tivites were comp	·	Add	ditio	na S	Site	Pe	tro S	cterization - Star Refinery Pole, Alaska		ase
VELL_PEGER 3	Ground Water Level at Time of Wellpoint Sampling  Mellpoint Screen  Wellpoint Riser  Groundwater sample depth offset from true depth due to symbol overlap  Analytical Groundwater Sample				r al Collapse or		LC	G	OF	- C	SEC	PROBE	SB13-03		
OBE V					nite Chips		y 20						1-1-11551-0	05	
3EOPR					Ib _ d       Analytical Groundwater Sample         Analytical Soil Sample				NO ical an	N 8	k W viron	/ILS	ON, INC. Consultants	FIG. 7	

	LOG OF GEOPROBE														
Date	Started	7/28/13	Location					G	round	d Ele	eva	tion:	(Not Mea	sured)	
Date	Completed	7/28/13						T	ypica	l Ru	n L	engtl	h 5 feet		
Total	Depth (ft)	10.0	Drilling Co	ompany: Ge	eoTek Alaska	, Inc.		Н	ole D	iam	eter	r:	2 inches		
Depth (ft)	and pi	robing method oximate boun	Soil I ext for a proper ds. The stratif adaries betwee	Descript r understand fication lines en soil types	ion	urface materials v represent the aries may be		Depth, ft.	Symbol	PID, ppm	Groundwater	Well Construction	Sample	Number	Depth (ft)
21-2047.6PJ6/18/14	Olive brofeet, wet subround sand; tra Flood-pla	own, Poorly below 6.5 ded gravel ace silt. ain alluviur ay, Poorly subangula allar to subr	y Graded So feet; fine to more (Qal)  Graded So readed So factor (Qal)	Sand (SP) to coarse edium, su and with ( unded gra and; trace	ded gravel; and; trace si  ); dry to moi , subangular to  Gravel (SP); vel; fine to r silt.	st below 6 r to subrounded wet; fine to	4	0		0.9 0.5 0.5 0.5	፟፟		П	.25-6.5)/SB-23- )	5
TAL.GPJ	may have slid	down in the tu	ube prior to rer	the upper pa moval from the sampling ac	art of the run, the he ground. tivites were con		Ac	lditi	ona s	Site	Pe	tro S	cterization - Star Refiner Pole, Alaska		ase
VELL_PEGER 3	or Wellpoint Sampling Wellpoint Riser					er ral Collapse or		L	OG	OF	= G	SEC	PROBE	SB13-04	
N N						onite Chips			2014					1-1-11551-0 r	05
3EOPR							SI Ge	SHANNON & WILSON, INC. Geotechnical and Environmental Consultants  FIG. 8							



### **Laboratory Report of Analysis**

To: Shannon & Wilson-Fairbanks

2355 Hill Road Fairbanks, AK 99707

Report Number: 1138165

Client Project: 1551-005 Petro Star

Dear Trevelyn Lough,

Sincerely,

**Project Manager** 

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 five 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 Jennifer 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.

SGS North America Inc.

Jennifer Dawkins Date

# SGS North America Inc.

# **Case Narrative**

Customer: SHANFBK Shannon & Wilson-Fairbanks

Project: 1138165 1551-005 Petro Star

Refer to the sample receipt form for information on sample condition.

1138165005 PS MW-10-02

AK102 - The pattern is consistent with a weathered gasoline.

1138165007 PS MW-10-12

AK102 - The pattern is consistent with a weathered gasoline.

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



### **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. If you have any questions regarding this report, or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343. All work is provided under SGS general terms and conditions (<a href="http://www.sgs.com/terms\_and\_conditions.htm">http://www.sgs.com/terms\_and\_conditions.htm</a>), unless other written agreements have been accepted by both parties.

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: 1020A, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035B, 6020, 7470A, 7471B, 8021B, 8082A, 8260B, 8270D, 8270D-SIM, 9040B, 9045C, 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 Continuing Calibration Verification

CL Control Limit

D The analyte concentration is the result of a dilution.

DF Dilution Factor

DL Detection Limit (i.e., maximum method detection limit)
E The analyte result is above the calibrated range.
F Indicates value that is greater than or equal to the DL

GT Greater Than IB Instrument Blank

ICV Initial Calibration Verification

J The quantitation is an estimation.

JL The analyte was positively identified, but the quantitation is a low estimation.

LCS(D) Laboratory Control Spike (Duplicate)

LOD Limit of Detection (i.e., 2xDL)

LOQ Limit of Quantitation (i.e., reporting or practical quantitation limit)

LT Less Than

M A matrix effect was present.

MB Method Blank

MS(D) Matrix Spike (Duplicate)

ND Indicates the analyte is not detected.Q QC parameter out of acceptance range.

R Rejected

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.



Samp	le Summary
------	------------

Client Sample ID	Lab Sample ID	Collected	Received	<u>Matrix</u>
SB-13-01	1138165001	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
SB-13-02	1138165002	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
SB-13-03	1138165003	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
SB-13-04	1138165004	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
MW-10-02	1138165005	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
MW-10-03	1138165006	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
MW-10-12	1138165007	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)
SB-13-01(7.1-8.1)	1138165008	07/28/2013	07/31/2013	Soil/Solid (dry weight)
SB-13-02(6.25-7.5)	1138165009	07/28/2013	07/31/2013	Soil/Solid (dry weight)
SB-13-03(5.6-6.5)	1138165010	07/28/2013	07/31/2013	Soil/Solid (dry weight)
SB-13-04(5.25-6.5)	1138165011	07/28/2013	07/31/2013	Soil/Solid (dry weight)
SB-23-04(5.25-6.5)	1138165012	07/28/2013	07/31/2013	Soil/Solid (dry weight)
Trip Blank	1138165013	07/28/2013	07/31/2013	Soil/Solid (dry weight)
Trip Blank	1138165014	07/28/2013	07/31/2013	Water (Surface, Eff., Ground)

MethodMethod DescriptionAK102Diesel Range Organics (S)AK102Diesel Range Organics (W)AK101Gasoline Range Organics (S)AK101Gasoline Range Organics (W)SM21 2540GPercent Solids SM2540G

SW8260B Volatile Organic Compounds (S) FIELD EXT

SW8260B Volatile Organic Compounds (W)



	Detectable Results Summary			
Client Sample ID: SB-13-01				
Lab Sample ID: 1138165001	<u>Parameter</u>	Result	<u>Units</u>	
Volatile Fuels	Gasoline Range Organics	0.0369J	mg/L	
Client Sample ID: SB-13-03				
Lab Sample ID: 1138165003	<u>Parameter</u>	Result	<u>Units</u>	
Semivolatile Organic Fuels	Diesel Range Organics	0.235J	mg/L	
Volatile Fuels	Gasoline Range Organics	0.0359J	mg/L	
Volatile GC/MS	Benzene	0.270J	ug/L	
Client Sample ID: SB-13-04				
Lab Sample ID: 1138165004	Parameter	Result	Units	
Volatile GC/MS	Benzene	0.720	ug/L	
Client Sample ID: MW-10-02			-	
Lab Sample ID: 1138165005	<u>Parameter</u>	<u>Result</u>	<u>Units</u>	
Semivolatile Organic Fuels	Diesel Range Organics	<u>Result</u> 0.721	mg/L	
Volatile Fuels	Gasoline Range Organics	1.71	mg/L	
Volatile GC/MS	Benzene	10.5	ug/L	
	Ethylbenzene	61.6	ug/L	
	o-Xylene	113	ug/L	
	P & M -Xylene	218	ug/L	
	Toluene	56.8	ug/L	
Client Sample ID: MW-10-03				
Lab Sample ID: 1138165006	Parameter	<u>Result</u>	<u>Units</u>	
Volatile GC/MS	o-Xylene	0.350J	ug/L	
	P & M -Xylene	0.720J	ug/L	
Client Sample ID: MW-10-12				
Lab Sample ID: 1138165007	Parameter	Popult	Units	
Semivolatile Organic Fuels	Diesel Range Organics	<u>Result</u> 0.890	mg/L	
Volatile Fuels	Gasoline Range Organics	1.62	mg/L	
Volatile GC/MS	Benzene	9.69	ug/L	
Volumo Go/mo	Ethylbenzene	59.0	ug/L	
	o-Xylene	110	ug/L	
	P & M -Xylene	216	ug/L	
	Toluene	64.7	ug/L	
Client Sample ID: SB-13-01(7.1-8.1)				
Lab Sample ID: 1138165008	Parameter	<u>Result</u>	<u>Units</u>	
Volatile Fuels	Gasoline Range Organics	1.39J	mg/Kg	
	<b>3 3</b>		5 5	
Client Sample ID: <b>SB-13-02(6.25-7.5)</b>	Damaratan	Б. "	1.1-24	
Lab Sample ID: 1138165009  Volatile Fuels	Parameter Gasoline Range Organics	<u>Result</u> 2.18J	<u>Units</u> mg/Kg	
	Gasoline Nange Organics	Z. 10J	mg/Ng	
Client Sample ID: SB-13-03(5.6-6.5)				
Lab Sample ID: 1138165010	<u>Parameter</u>	Result	<u>Units</u>	
Semivolatile Organic Fuels	Diesel Range Organics	12.4J	mg/Kg	

Print Date: 08/12/2013 10:21:08AM

**Volatile Fuels** 

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

Gasoline Range Organics

mg/Kg

1.63J



# **Detectable Results Summary**

Client Sample ID: SB-13-04(5.25-6.5) Lab Sample ID: 1138165011 Semivolatile Organic Fuels Volatile Fuels	Parameter Diesel Range Organics Gasoline Range Organics	Result 21.5J 1.28J	Units mg/Kg mg/Kg
Client Sample ID: SB-23-04(5.25-6.5) Lab Sample ID: 1138165012 Semivolatile Organic Fuels Volatile Fuels	<u>Parameter</u> Diesel Range Organics Gasoline Range Organics	Result 6.96J 1.47J	Units mg/Kg mg/Kg
Client Sample ID: <b>Trip Blank</b> Lab Sample ID: 1138165013 <b>Volatile Fuels</b>	<u>Parameter</u> Gasoline Range Organics	Result 0.986J	<u>Units</u> mg/Kg



Client Sample ID: SB-13-01

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165001 Lab Project ID: 1138165 Collection Date: 07/28/13 17:53 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Semivolatile Organic Fuels

Parameter Diesel Range Organics	Result Qual 0.370 U	LOQ/CL 0.615	<u>DL</u> 0.185	<u>Units</u> mg/L	<u>DF</u> 1	<u>Date Analyzed</u> 08/09/13 16:34
Surrogates						
5a Androstane	100	50-150		%	1	08/09/13 16:34

### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 16:34 Container ID: 1138165001-G

Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 975 mL Prep Extract Vol: 1 mL



Client Sample ID: SB-13-01

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165001 Lab Project ID: 1138165

Collection Date: 07/28/13 17:53 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL DL	<u>Units</u> <u>DF</u>	Date Analyzed
Gasoline Range Organics	0.0369 J	0.100 0.03	10 mg/L 1	08/02/13 10:52
•				

**Surrogates** 

4-Bromofluorobenzene 99.4 50-150 1 08/02/13 10:52

### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/02/13 10:52

Container ID: 1138165001-F

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: SB-13-01

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165001 Lab Project ID: 1138165 Collection Date: 07/28/13 17:53 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.240 U	0.400	0.120	ug/L	1	08/01/13 14:14
Ethylbenzene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:14
o-Xylene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:14
P & M -Xylene	1.24 U	2.00	0.620	ug/L	1	08/01/13 14:14
Toluene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:14
Surrogates						
1,2-Dichloroethane-D4	104	70-120		%	1	08/01/13 14:14
4-Bromofluorobenzene	94.4	75-120		%	1	08/01/13 14:14
Toluene-d8	96.4	85-120		%	1	08/01/13 14:14

### **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 14:14 Container ID: 1138165001-A

Prep Batch: VXX25004 Prep Method: SW5030B Prep Date/Time: 08/01/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: SB-13-02

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165002 Lab Project ID: 1138165 Collection Date: 07/28/13 20:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Semivolatile Organic Fuels

	<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
I	Diesel Range Organics	0.360 U	0.600	0.180	mg/L	1	08/09/13 16:54
I	Surrogates						
l	5a Androstane	97.4	50-150		%	1	08/09/13 16:54

### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 16:54 Container ID: 1138165002-G Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 1000 mL Prep Extract Vol: 1 mL



Client Sample ID: SB-13-02

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165002 Lab Project ID: 1138165 Collection Date: 07/28/13 20:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics	0.0620 U	0.100	0.0310	mg/L	1	08/02/13 11:11

**Surrogates** 

4-Bromofluorobenzene 99.6 50-150 % 1 08/02/13 11:11

### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/02/13 11:11 Container ID: 1138165002-F

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: SB-13-02

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165002 Lab Project ID: 1138165 Collection Date: 07/28/13 20:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.240 U	0.400	0.120	ug/L	1	08/01/13 14:32
Ethylbenzene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:32
o-Xylene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:32
P & M -Xylene	1.24 U	2.00	0.620	ug/L	1	08/01/13 14:32
Toluene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:32
Surrogates						
1,2-Dichloroethane-D4	107	70-120		%	1	08/01/13 14:32
4-Bromofluorobenzene	97.2	75-120		%	1	08/01/13 14:32
Toluene-d8	97.5	85-120		%	1	08/01/13 14:32

### **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 14:32 Container ID: 1138165002-A

Prep Batch: VXX25004 Prep Method: SW5030B Prep Date/Time: 08/01/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: SB-13-03

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165003 Lab Project ID: 1138165 Collection Date: 07/28/13 19:49 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

### Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics	0.235 J	0.625	0.188	mg/L	1	08/09/13 17:15
Surrogates						
5a Androstane	93.3	50-150		%	1	08/09/13 17:15

### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 17:15 Container ID: 1138165003-G Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 960 mL Prep Extract Vol: 1 mL



Client Sample ID: SB-13-03

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165003 Lab Project ID: 1138165 Collection Date: 07/28/13 19:49 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics	0.0359 J	0.100	0.0310	mg/L	1	08/02/13 11:29

# **Surrogates**

4-Bromofluorobenzene 97.2 50-150 % 1 08/02/13 11:29

#### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101

Analyst: ST

Analytical Date/Time: 08/02/13 11:29

Container ID: 1138165003-F

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: SB-13-03

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165003 Lab Project ID: 1138165 Collection Date: 07/28/13 19:49 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.270 J	0.400	0.120	ug/L	1	08/01/13 14:50
Ethylbenzene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:50
o-Xylene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:50
P & M -Xylene	1.24 U	2.00	0.620	ug/L	1	08/01/13 14:50
Toluene	0.620 U	1.00	0.310	ug/L	1	08/01/13 14:50
Surrogates						
1,2-Dichloroethane-D4	105	70-120		%	1	08/01/13 14:50
4-Bromofluorobenzene	96.2	75-120		%	1	08/01/13 14:50
Toluene-d8	99	85-120		%	1	08/01/13 14:50

# **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 14:50 Container ID: 1138165003-A

Prep Batch: VXX25004 Prep Method: SW5030B Prep Date/Time: 08/01/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: SB-13-04

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165004 Lab Project ID: 1138165 Collection Date: 07/28/13 19:25 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics	0.360 U	0.600	0.180	mg/L	1	08/09/13 17:36
Surrogates						
5a Androstane	96.6	50-150		%	1	08/09/13 17:36

#### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 17:36 Container ID: 1138165004-G Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 1000 mL Prep Extract Vol: 1 mL



Client Sample ID: SB-13-04

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165004 Lab Project ID: 1138165

Collection Date: 07/28/13 19:25 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Gasoline Range Organics	0.0620 U	0.100	0.0310	mg/L	1	08/02/13 11:48

**Surrogates** 

4-Bromofluorobenzene 98.4 50-150 1 08/02/13 11:48

#### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/02/13 11:48

Container ID: 1138165004-F

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

Print Date: 08/12/2013 10:21:09AM

SGS North America Inc.



Client Sample ID: SB-13-04

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165004 Lab Project ID: 1138165 Collection Date: 07/28/13 19:25 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.720	0.400	0.120	ug/L	1	08/01/13 15:07
Ethylbenzene	0.620 U	1.00	0.310	ug/L	1	08/01/13 15:07
o-Xylene	0.620 U	1.00	0.310	ug/L	1	08/01/13 15:07
P & M -Xylene	1.24 U	2.00	0.620	ug/L	1	08/01/13 15:07
Toluene	0.620 U	1.00	0.310	ug/L	1	08/01/13 15:07
Surrogates						
1,2-Dichloroethane-D4	102	70-120		%	1	08/01/13 15:07
4-Bromofluorobenzene	98.7	75-120		%	1	08/01/13 15:07
Toluene-d8	103	85-120		%	1	08/01/13 15:07

# **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 15:07 Container ID: 1138165004-A

Prep Batch: VXX25004
Prep Method: SW5030B
Prep Date/Time: 08/01/13 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



Client Sample ID: MW-10-02

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165005 Lab Project ID: 1138165 Collection Date: 07/28/13 22:30 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Semivolatile Organic Fuels

Parameter Diesel Range Organics	Result Qual 0.721	LOQ/CL 0.638	<u>DL</u> 0.191	<u>Units</u> mg/L	<u>DF</u> 1	<u>Date Analyzed</u> 08/09/13 17:56
Surrogates 5a Androstane	98.2	50-150		%	1	08/09/13 17:56

#### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 17:56 Container ID: 1138165005-G Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 940 mL Prep Extract Vol: 1 mL



Client Sample ID: MW-10-02

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165005 Lab Project ID: 1138165

Collection Date: 07/28/13 22:30 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual 1.71	LOQ/CL 0.500	<u>DL</u> 0.155	<u>Units</u> mg/L	<u>DF</u> 5	<u>Date Analyzed</u> 08/02/13 12:43
Surrogates						
4-Bromofluorobenzene	115	50-150		%	5	08/02/13 12:43

#### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/02/13 12:43 Container ID: 1138165005-F

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: MW-10-02

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165005 Lab Project ID: 1138165 Collection Date: 07/28/13 22:30 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	10.5	0.400	0.120	ug/L	1	08/01/13 15:26
Ethylbenzene	61.6	1.00	0.310	ug/L	1	08/01/13 15:26
o-Xylene	113	10.0	3.10	ug/L	10	08/01/13 19:26
P & M -Xylene	218	20.0	6.20	ug/L	10	08/01/13 19:26
Toluene	56.8	10.0	3.10	ug/L	10	08/01/13 19:26
Surrogates						
1,2-Dichloroethane-D4	103	70-120		%	1	08/01/13 15:26
4-Bromofluorobenzene	91.2	75-120		%	1	08/01/13 15:26
Toluene-d8	103	85-120		%	1	08/01/13 15:26

# **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 15:26 Container ID: 1138165005-A

Prep Batch: VXX25004 Prep Method: SW5030B Prep Date/Time: 08/01/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: MW-10-03

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165006 Lab Project ID: 1138165 Collection Date: 07/28/13 15:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics	0.376 U	0.625	0.188	mg/L	1	08/09/13 18:17
Surrogates						
5a Androstane	99.3	50-150		%	1	08/09/13 18:17

#### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 18:17 Container ID: 1138165006-G Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 960 mL Prep Extract Vol: 1 mL



Client Sample ID: MW-10-03

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165006 Lab Project ID: 1138165 Collection Date: 07/28/13 15:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL DL	<u>Units</u> <u>DF</u>	Date Analyzed
Gasoline Range Organics	0.0620 U	0.100 0.031	0 mg/L 1	08/02/13 13:39
0				

**Surrogates** 

4-Bromofluorobenzene 97.8 50-150 % 1 08/02/13 13:39

#### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/02/13 13:39 Container ID: 1138165006-F Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: MW-10-03

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165006 Lab Project ID: 1138165 Collection Date: 07/28/13 15:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.240 U	0.400	0.120	ug/L	1	08/01/13 15:59
Ethylbenzene	0.620 U	1.00	0.310	ug/L	1	08/01/13 15:59
o-Xylene	0.350 J	1.00	0.310	ug/L	1	08/01/13 15:59
P & M -Xylene	0.720 J	2.00	0.620	ug/L	1	08/01/13 15:59
Toluene	0.620 U	1.00	0.310	ug/L	1	08/01/13 15:59
Surrogates						
1,2-Dichloroethane-D4	97.9	70-120		%	1	08/01/13 15:59
4-Bromofluorobenzene	99.1	75-120		%	1	08/01/13 15:59
Toluene-d8	92.4	85-120		%	1	08/01/13 15:59

# **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 15:59 Container ID: 1138165006-A Prep Batch: VXX25004 Prep Method: SW5030B Prep Date/Time: 08/01/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: MW-10-12

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165007 Lab Project ID: 1138165 Collection Date: 07/28/13 22:20 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	0.890	0.638	0.191	mg/L	1	08/09/13 18:38
Surrogates 5a Androstane	102	50-150		%	1	08/09/13 18:38

#### **Batch Information**

Analytical Batch: XFC11005 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/09/13 18:38 Container ID: 1138165007-G Prep Batch: XXX29522 Prep Method: SW3520C Prep Date/Time: 08/01/13 09:15 Prep Initial Wt./Vol.: 940 mL Prep Extract Vol: 1 mL



Client Sample ID: MW-10-12

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165007 Lab Project ID: 1138165

Collection Date: 07/28/13 22:20 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual 1.62	LOQ/CL 0.500	<u>DL</u> 0.155	<u>Units</u> mg/L	<u>DF</u> 5	<u>Date Analyzed</u> 08/02/13 13:02
Surrogates						
4-Bromofluorobenzene	114	50-150		%	5	08/02/13 13:02

#### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/02/13 13:02

Container ID: 1138165007-F

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: MW-10-12

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165007 Lab Project ID: 1138165 Collection Date: 07/28/13 22:20 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	9.69	0.400	0.120	ug/L	1	08/01/13 16:16
Ethylbenzene	59.0	1.00	0.310	ug/L	1	08/01/13 16:16
o-Xylene	110	10.0	3.10	ug/L	10	08/01/13 19:43
P & M -Xylene	216	20.0	6.20	ug/L	10	08/01/13 19:43
Toluene	64.7	1.00	0.310	ug/L	1	08/01/13 16:16
Surrogates						
1,2-Dichloroethane-D4	95.3	70-120		%	1	08/01/13 16:16
4-Bromofluorobenzene	97.9	75-120		%	1	08/01/13 16:16
Toluene-d8	98.6	85-120		%	1	08/01/13 16:16

# **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 16:16 Container ID: 1138165007-A

Prep Batch: VXX25004 Prep Method: SW5030B Prep Date/Time: 08/01/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



# Results of SB-13-01(7.1-8.1)

Client Sample ID: **SB-13-01(7.1-8.1)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165008 Lab Project ID: 1138165 Collection Date: 07/28/13 14:59 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 89.9

# Results by Semivolatile Organic Fuels

<u>Parameter</u> Diesel Range Organics	Result Qual		<u>DL</u> 6.86	<u>Units</u> mg/Kg	<u>DF</u> 1	<u>Date Analyzed</u> 08/02/13 22:23
Surrogates 5a Androstane	92.3	50-150		%	1	08/02/13 22:23

#### **Batch Information**

Analytical Batch: XFC10989 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/02/13 22:23 Container ID: 1138165008-A Prep Batch: XXX29529 Prep Method: SW3550C Prep Date/Time: 08/01/13 18:30 Prep Initial Wt./Vol.: 30.161 g Prep Extract Vol: 1 mL



# Results of SB-13-01(7.1-8.1)

Client Sample ID: **SB-13-01(7.1-8.1)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165008 Lab Project ID: 1138165 Collection Date: 07/28/13 14:59 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 89.9

# Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL DL	<u>Units</u> <u>DF</u>	Date Analyzed
Gasoline Range Organics	1.39 J	1.54 0.463	mg/Kg 1	08/06/13 04:32
Surrogates				
4-Bromofluorobenzene	140	50-150	% 1	08/06/13 04:32

#### **Batch Information**

Analytical Batch: VFC11552 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/06/13 04:32 Container ID: 1138165008-B

Prep Batch: VXX25017 Prep Method: SW5035A Prep Date/Time: 07/28/13 14:59 Prep Initial Wt./Vol.: 141.356 g Prep Extract Vol: 39.2644 mL



# Results of SB-13-01(7.1-8.1)

Client Sample ID: **SB-13-01(7.1-8.1)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165008 Lab Project ID: 1138165 Collection Date: 07/28/13 14:59 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 89.9

# Results by Volatile GC/MS

<u>Parameter</u>	<u>Result</u>	Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.00482	U	0.00772	0.00241	mg/Kg	1	08/01/13 21:49
Ethylbenzene	0.00964	U	0.0154	0.00482	mg/Kg	1	08/01/13 21:49
o-Xylene	0.00964	U	0.0154	0.00482	mg/Kg	1	08/01/13 21:49
P & M -Xylene	0.0185	U	0.0309	0.00927	mg/Kg	1	08/01/13 21:49
Toluene	0.00964	U	0.0154	0.00482	mg/Kg	1	08/01/13 21:49
Surrogates							
1,2-Dichloroethane-D4	109		79-118		%	1	08/01/13 21:49
4-Bromofluorobenzene	124		67-138		%	1	08/01/13 21:49
Toluene-d8	107		85-115		%	1	08/01/13 21:49

# **Batch Information**

Analytical Batch: VMS13657 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 21:49 Container ID: 1138165008-B

Prep Batch: VXX25002 Prep Method: SW5035A

Prep Date/Time: 07/28/13 14:59 Prep Initial Wt./Vol.: 141.356 g Prep Extract Vol: 39.2644 mL



# Results of SB-13-02(6.25-7.5)

Client Sample ID: **SB-13-02(6.25-7.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165009 Lab Project ID: 1138165 Collection Date: 07/28/13 15:55 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 80.1

# Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics	15.2 U	24.6	7.62	mg/Kg	1	08/02/13 22:43
Surrogates 5a Androstane	90.8	50-150		%	1	08/02/13 22:43

#### **Batch Information**

Analytical Batch: XFC10989 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/02/13 22:43 Container ID: 1138165009-A Prep Batch: XXX29529 Prep Method: SW3550C Prep Date/Time: 08/01/13 18:30 Prep Initial Wt./Vol.: 30.461 g Prep Extract Vol: 1 mL



# Results of SB-13-02(6.25-7.5)

Client Sample ID: **SB-13-02(6.25-7.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165009 Lab Project ID: 1138165 Collection Date: 07/28/13 15:55 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 80.1

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual 2.18 J	<u>LOQ/CL</u> 2.84	<u>DL</u> 0.853	<u>Units</u> mg/Kg	<u>DF</u> 1	<u>Date Analyzed</u> 08/06/13 04:50
Surrogates						
4-Bromofluorobenzene	135	50-150		%	1	08/06/13 04:50

#### **Batch Information**

Analytical Batch: VFC11552 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/06/13 04:50 Container ID: 1138165009-B

Prep Batch: VXX25017 Prep Method: SW5035A Prep Date/Time: 07/28/13 15:55 Prep Initial Wt./Vol.: 97.484 g Prep Extract Vol: 44.4037 mL



# Results of SB-13-02(6.25-7.5)

Client Sample ID: **SB-13-02(6.25-7.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165009 Lab Project ID: 1138165 Collection Date: 07/28/13 15:55 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 80.1

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.00888 U	0.0142	0.00444	mg/Kg	1	08/01/13 22:06
Ethylbenzene	0.0177 U	0.0284	0.00887	mg/Kg	1	08/01/13 22:06
o-Xylene	0.0177 U	0.0284	0.00887	mg/Kg	1	08/01/13 22:06
P & M -Xylene	0.0342 U	0.0569	0.0171	mg/Kg	1	08/01/13 22:06
Toluene	0.0177 U	0.0284	0.00887	mg/Kg	1	08/01/13 22:06
Surrogates						
1,2-Dichloroethane-D4	107	79-118		%	1	08/01/13 22:06
4-Bromofluorobenzene	121	67-138		%	1	08/01/13 22:06
Toluene-d8	102	85-115		%	1	08/01/13 22:06

# **Batch Information**

Analytical Batch: VMS13657 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 22:06 Container ID: 1138165009-B

Prep Batch: VXX25002 Prep Method: SW5035A Prep Date/Time: 07/28/13 15:55 Prep Initial Wt./Vol.: 97.484 g Prep Extract Vol: 44.4037 mL



# Results of SB-13-03(5.6-6.5)

Client Sample ID: **SB-13-03(5.6-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165010 Lab Project ID: 1138165 Collection Date: 07/28/13 16:55 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 83.2

# Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
Diesel Range Organics		24.0	7.43	mg/Kg	1	08/03/13 02:08
Surrogates 5a Androstane	99.8	50-150		%	1	08/03/13 02:08

#### **Batch Information**

Analytical Batch: XFC10989 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/03/13 02:08 Container ID: 1138165010-A Prep Batch: XXX29529 Prep Method: SW3550C Prep Date/Time: 08/01/13 18:30 Prep Initial Wt./Vol.: 30.11 g Prep Extract Vol: 1 mL



# Results of SB-13-03(5.6-6.5)

Client Sample ID: **SB-13-03(5.6-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165010 Lab Project ID: 1138165 Collection Date: 07/28/13 16:55 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 83.2

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual	<u>LOQ/CL</u> 2.49	<u>DL</u> 0.748	<u>Units</u> mg/Kg	<u>DF</u> 1	<u>Date Analyzed</u> 08/06/13 05:09
Surrogates						
4-Bromofluorobenzene	126	50-150		%	1	08/06/13 05:09

#### **Batch Information**

Analytical Batch: VFC11552 Analytical Method: AK101

Analyst: ST

Analytical Date/Time: 08/06/13 05:09 Container ID: 1138165010-B Prep Batch: VXX25017 Prep Method: SW5035A Prep Date/Time: 07/28/13 16:55 Prep Initial Wt./Vol.: 101.494 g Prep Extract Vol: 42.1 mL



# Results of SB-13-03(5.6-6.5)

Client Sample ID: **SB-13-03(5.6-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165010 Lab Project ID: 1138165 Collection Date: 07/28/13 16:55 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 83.2

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.00778 U	0.0125	0.00389	mg/Kg	1	08/04/13 18:24
Ethylbenzene	0.0156 U	0.0249	0.00778	mg/Kg	1	08/04/13 18:24
o-Xylene	0.0156 U	0.0249	0.00778	mg/Kg	1	08/04/13 18:24
P & M -Xylene	0.0300 U	0.0499	0.0150	mg/Kg	1	08/04/13 18:24
Toluene	0.0156 U	0.0249	0.00778	mg/Kg	1	08/04/13 18:24
Surrogates						
1,2-Dichloroethane-D4	91.9	79-118		%	1	08/04/13 18:24
4-Bromofluorobenzene	111	67-138		%	1	08/04/13 18:24
Toluene-d8	93.3	85-115		%	1	08/04/13 18:24

# **Batch Information**

Analytical Batch: VMS13661 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/04/13 18:24 Container ID: 1138165010-B Prep Batch: VXX25010 Prep Method: SW5035A

Prep Date/Time: 07/28/13 16:55 Prep Initial Wt./Vol.: 101.494 g Prep Extract Vol: 42.1 mL



# Results of SB-13-04(5.25-6.5)

Client Sample ID: **SB-13-04(5.25-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165011 Lab Project ID: 1138165 Collection Date: 07/28/13 17:41 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 86.2

# Results by Semivolatile Organic Fuels

<u>Parameter</u>	Result Qual	LOQ/CL DL	<u>Units</u>	<u>DF</u>	Date Analyzed
Diesel Range Organics	21.5 J	23.0 7.1	4 mg/Kg	1	08/08/13 21:30
Surrogates					
5a Androstane	94.1	50-150	%	1	08/08/13 21:30

#### **Batch Information**

Analytical Batch: XFC11002 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/08/13 21:30 Container ID: 1138165011-A

Prep Batch: XXX29542 Prep Method: SW3550C Prep Date/Time: 08/02/13 16:30 Prep Initial Wt./Vol.: 30.22 g Prep Extract Vol: 1 mL



# Results of SB-13-04(5.25-6.5)

Client Sample ID: **SB-13-04(5.25-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165011 Lab Project ID: 1138165 Collection Date: 07/28/13 17:41 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 86.2

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual 1.28 J	LOQ/CL DL 2.26 0.679	Units DF mg/Kg 1	<u>Date Analyzed</u> 08/06/13 05:27
Surrogates				
4-Bromofluorobenzene	132	50-150	% 1	08/06/13 05:27

#### **Batch Information**

Analytical Batch: VFC11552 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/06/13 05:27 Container ID: 1138165011-B Prep Batch: VXX25017 Prep Method: SW5035A Prep Date/Time: 07/28/13 17:41 Prep Initial Wt./Vol.: 99.32 g Prep Extract Vol: 38.7277 mL



# Results of SB-13-04(5.25-6.5)

Client Sample ID: **SB-13-04(5.25-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165011 Lab Project ID: 1138165 Collection Date: 07/28/13 17:41 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 86.2

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.00706 U	0.0113	0.00353	mg/Kg	1	08/04/13 18:42
Ethylbenzene	0.0141 U	0.0226	0.00706	mg/Kg	1	08/04/13 18:42
o-Xylene	0.0141 U	0.0226	0.00706	mg/Kg	1	08/04/13 18:42
P & M -Xylene	0.0272 U	0.0452	0.0136	mg/Kg	1	08/04/13 18:42
Toluene	0.0141 U	0.0226	0.00706	mg/Kg	1	08/04/13 18:42
Surrogates						
1,2-Dichloroethane-D4	94.1	79-118		%	1	08/04/13 18:42
4-Bromofluorobenzene	116	67-138		%	1	08/04/13 18:42
Toluene-d8	88.2	85-115		%	1	08/04/13 18:42

# **Batch Information**

Analytical Batch: VMS13661 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/04/13 18:42 Container ID: 1138165011-B Prep Batch: VXX25010 Prep Method: SW5035A Prep Date/Time: 07/28/13 17:41 Prep Initial Wt./Vol.: 99.32 g Prep Extract Vol: 38.7277 mL



# Results of SB-23-04(5.25-6.5)

Client Sample ID: **SB-23-04(5.25-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165012 Lab Project ID: 1138165 Collection Date: 07/28/13 17:36 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 92.4

# Results by Semivolatile Organic Fuels

Parameter Diesel Range Organics	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Date Analyzed</u>
	6.96 J	21.3	6.61	mg/Kg	1	08/08/13 21:40
Surrogates 5a Androstane	88.2	50-150		%	1	08/08/13 21:40

#### **Batch Information**

Analytical Batch: XFC11002 Analytical Method: AK102 Analyst: EAB

Analytical Date/Time: 08/08/13 21:40 Container ID: 1138165012-A

Prep Batch: XXX29542 Prep Method: SW3550C Prep Date/Time: 08/02/13 16:30 Prep Initial Wt./Vol.: 30.434 g Prep Extract Vol: 1 mL



# Results of SB-23-04(5.25-6.5)

Client Sample ID: SB-23-04(5.25-6.5) Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165012 Lab Project ID: 1138165

Collection Date: 07/28/13 17:36 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 92.4

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual 1.47 J	LOQ/CL DL 2.13 0.639	<u>Units</u> mg/Kg	<u>DF</u> 1	<u>Date Analyzed</u> 08/06/13 05:46
Surrogates					
4-Bromofluorobenzene	104	50-150	%	1	08/06/13 05:46

#### **Batch Information**

Analytical Batch: VFC11552 Analytical Method: AK101 Analyst: ST

Analytical Date/Time: 08/06/13 05:46 Container ID: 1138165012-B

Prep Batch: VXX25017 Prep Method: SW5035A Prep Date/Time: 07/28/13 17:36 Prep Initial Wt./Vol.: 78.674 g Prep Extract Vol: 30.9634 mL



# Results of SB-23-04(5.25-6.5)

Client Sample ID: **SB-23-04(5.25-6.5)**Client Project ID: **1551-005 Petro Star** 

Lab Sample ID: 1138165012 Lab Project ID: 1138165 Collection Date: 07/28/13 17:36 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%): 92.4

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.00664 U	0.0106	0.00332	mg/Kg	1	08/04/13 18:59
Ethylbenzene	0.0133 U	0.0213	0.00664	mg/Kg	1	08/04/13 18:59
o-Xylene	0.0133 U	0.0213	0.00664	mg/Kg	1	08/04/13 18:59
P & M -Xylene	0.0256 U	0.0426	0.0128	mg/Kg	1	08/04/13 18:59
Toluene	0.0133 U	0.0213	0.00664	mg/Kg	1	08/04/13 18:59
Surrogates						
1,2-Dichloroethane-D4	93.5	79-118		%	1	08/04/13 18:59
4-Bromofluorobenzene	101	67-138		%	1	08/04/13 18:59
Toluene-d8	89.1	85-115		%	1	08/04/13 18:59

# **Batch Information**

Analytical Batch: VMS13661 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/04/13 18:59 Container ID: 1138165012-B Prep Batch: VXX25010 Prep Method: SW5035A Prep Date/Time: 07/28/13 17:36 Prep Initial Wt./Vol.: 78.674 g Prep Extract Vol: 30.9634 mL



Client Sample ID: Trip Blank

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165013 Lab Project ID: 1138165 Collection Date: 07/28/13 14:59 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%):

# Results by Volatile Fuels

Parameter Gasoline Range Organics	Result Qual 0.986 J	LOQ/CL DL 2.49 0.748	<u>Units</u> <u>DF</u> mg/Kg 1	<u>Date Analyzed</u> 08/06/13 19:21
Surrogates				
4-Bromofluorobenzene	110	50-150	% 1	08/06/13 19:21

#### **Batch Information**

Analytical Batch: VFC11554 Analytical Method: AK101

Analyst: ST

Analytical Date/Time: 08/06/13 19:21 Container ID: 1138165013-A

Prep Batch: VXX25022 Prep Method: SW5035A Prep Date/Time: 07/28/13 14:59 Prep Initial Wt./Vol.: 50.12 g Prep Extract Vol: 25 mL



Client Sample ID: Trip Blank

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165013 Lab Project ID: 1138165 Collection Date: 07/28/13 14:59 Received Date: 07/31/13 08:50 Matrix: Soil/Solid (dry weight)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result	Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.00778	U	0.0125	0.00389	mg/Kg	1	08/06/13 21:13
Ethylbenzene	0.0156	U	0.0249	0.00778	mg/Kg	1	08/06/13 21:13
o-Xylene	0.0156	U	0.0249	0.00778	mg/Kg	1	08/06/13 21:13
P & M -Xylene	0.0300	U	0.0499	0.0150	mg/Kg	1	08/06/13 21:13
Toluene	0.0156	U	0.0249	0.00778	mg/Kg	1	08/06/13 21:13
Surrogates							
1,2-Dichloroethane-D4	111		79-118		%	1	08/06/13 21:13
4-Bromofluorobenzene	115		67-138		%	1	08/06/13 21:13
Toluene-d8	114		85-115		%	1	08/06/13 21:13

# **Batch Information**

Analytical Batch: VMS13663 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/06/13 21:13 Container ID: 1138165013-A

Prep Batch: VXX25019
Prep Method: SW5035A
Prep Date/Time: 07/28/13 14:59
Prep Initial Wt./Vol.: 50.12 g
Prep Extract Vol: 25 mL



Client Sample ID: Trip Blank

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165014 Lab Project ID: 1138165 Collection Date: 07/28/13 15:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile Fuels

<u>Parameter</u>	Result Qual	LOQ/CL DL	<u>Units</u> <u>DF</u>	Date Analyzed
Gasoline Range Organics	0.0620 U	0.100 0.0310	mg/L 1	08/02/13 10:34
•				

**Surrogates** 

4-Bromofluorobenzene 96.1 50-150 % 1 08/02/13 10:34

#### **Batch Information**

Analytical Batch: VFC11546 Analytical Method: AK101

Analyst: ST

Analytical Date/Time: 08/02/13 10:34 Container ID: 1138165014-B

Prep Batch: VXX25007 Prep Method: SW5030B Prep Date/Time: 08/02/13 08:00 Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL



Client Sample ID: Trip Blank

Client Project ID: 1551-005 Petro Star

Lab Sample ID: 1138165014 Lab Project ID: 1138165 Collection Date: 07/28/13 15:56 Received Date: 07/31/13 08:50 Matrix: Water (Surface, Eff., Ground)

Solids (%):

# Results by Volatile GC/MS

<u>Parameter</u>	Result Qual	LOQ/CL	<u>DL</u>	<u>Units</u>	<u>DF</u>	Date Analyzed
Benzene	0.240 U	0.400	0.120	ug/L	1	08/01/13 12:31
Ethylbenzene	0.620 U	1.00	0.310	ug/L	1	08/01/13 12:31
o-Xylene	0.620 U	1.00	0.310	ug/L	1	08/01/13 12:31
P & M -Xylene	1.24 U	2.00	0.620	ug/L	1	08/01/13 12:31
Toluene	0.620 U	1.00	0.310	ug/L	1	08/01/13 12:31
Surrogates						
1,2-Dichloroethane-D4	102	70-120		%	1	08/01/13 12:31
4-Bromofluorobenzene	98.1	75-120		%	1	08/01/13 12:31
Toluene-d8	109	85-120		%	1	08/01/13 12:31

# **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Analyst: HM

Analytical Date/Time: 08/01/13 12:31 Container ID: 1138165014-A

Prep Batch: VXX25004
Prep Method: SW5030B
Prep Date/Time: 08/01/13 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL



# Method Blank

Blank ID: MB for HBN 1468961 [SPT/9098]

Blank Lab ID: 1164323

QC for Samples:

1138165008, 1138165009, 1138165010, 1138165011, 1138165012

Matrix: Soil/Solid (dry weight)

# Results by SM21 2540G

 Parameter
 Results
 LOQ/CL
 DL
 Units

 Total Solids
 100
 %

#### **Batch Information**

Analytical Batch: SPT9098 Analytical Method: SM21 2540G

Instrument: Analyst: KRL

Analytical Date/Time: 8/1/2013 6:35:00PM



# **Duplicate Sample Summary**

Original Sample ID: 1133385011 Duplicate Sample ID: 1164325

QC for Samples:

1138165008, 1138165009, 1138165010, 1138165011, 1138165012

Analysis Date: 08/01/2013 18:35 Matrix: Soil/Solid (dry weight)

# Results by SM21 2540G

 NAME
 Original
 Duplicate
 RPD (%)
 RPD CL

 Total Solids
 85.7
 85.7
 0.06
 15.00

#### **Batch Information**

Analytical Batch: SPT9098 Analytical Method: SM21 2540G

Instrument: Analyst: KRL



# Method Blank

Blank ID: MB for HBN 1468902 [VXX/25002]

Blank Lab ID: 1164171

QC for Samples:

1138165008, 1138165009

Matrix: Soil/Solid (dry weight)

# Results by SW8260B

<u>Parameter</u>	Results	LOQ/CL	<u>DL</u>	<u>Units</u>
Benzene	0.00780U	0.0125	0.00390	mg/Kg
Ethylbenzene	0.0156U	0.0250	0.00780	mg/Kg
o-Xylene	0.0156U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0300U	0.0500	0.0150	mg/Kg
Toluene	0.0156U	0.0250	0.00780	mg/Kg
Surrogates				
1,2-Dichloroethane-D4	109	79-118		%
4-Bromofluorobenzene	109	67-138		%
Toluene-d8	107	85-115		%

# **Batch Information**

Analytical Batch: VMS13657 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Analytical Date/Time: 8/1/2013 2:03:01PM

Prep Batch: VXX25002 Prep Method: SW5035A

Prep Date/Time: 8/1/2013 8:00:00AM

Prep Initial Wt./Vol.: 50 g Prep Extract Vol: 25 mL



Blank Spike ID: LCS for HBN 1138165 [VXX25002]

Blank Spike Lab ID: 1164172 Date Analyzed: 08/01/2013 14:21

Matrix: Soil/Solid (dry weight)

QC for Samples: 1138165008, 1138165009

#### Results by SW8260B

	Blank Spike (mg/Kg)											
<u>Parameter</u>	<u>Spike</u>	Result	Rec (%)	<u>CL</u>								
Benzene	0.750	0.770	103	( 75-125 )								
Ethylbenzene	0.750	0.760	101	( 75-125 )								
o-Xylene	0.750	0.746	100	( 75-125 )								
P & M -Xylene	1.50	1.54	102	( 80-125 )								
Toluene	0.750	0.769	102	(70-125)								
Surrogates												
1,2-Dichloroethane-D4			107	(79-118)								
4-Bromofluorobenzene			109	( 67-138 )								
Toluene-d8			104	( 85-115 )								

#### **Batch Information**

Analytical Batch: VMS13657 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Prep Batch: VXX25002
Prep Method: SW5035A

Prep Date/Time: 08/01/2013 08:00

Spike Init Wt./Vol.: 0.750 mg/Kg Extract Vol: 25 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/12/2013 10:21:14AM



#### **Matrix Spike Summary**

Original Sample ID: 1164173 MS Sample ID: 1164174 MS MSD Sample ID: 1164175 MSD

QC for Samples: 1138165008, 1138165009

Analysis Date: 08/01/2013 16:39 Analysis Date: 08/01/2013 16:57 Analysis Date: 08/01/2013 14:56 Matrix: Solid/Soil (Wet Weight)

#### Results by SW8260B

		Mat	rix Spike (n	ng/Kg)	Spike	Duplicate	(mg/Kg)			
<u>Parameter</u>	<u>Sample</u>	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.00820U	0.789	0.764	97	0.789	0.782	99	75-125	2.30	(< 20 )
Ethylbenzene	0.0164U	0.789	0.771	98	0.789	0.783	99	75-125	1.60	(< 20)
o-Xylene	0.0139J	0.789	0.772	96	0.789	0.790	98	75-125	2.40	(< 20 )
P & M -Xylene	0.0181J	1.58	1.56	98	1.58	1.60	100	80-125	2.50	(< 20)
Toluene	0.0131J	0.789	0.767	96	0.789	0.793	99	70-125	3.40	(< 20 )
Surrogates										
1,2-Dichloroethane-D4		0.789	0.781	99	0.789	0.840	106	79-118	7.20	
4-Bromofluorobenzene		2.10	1.91	91	2.10	1.97	94	67-138	3.20	
Toluene-d8		0.789	0.776	98	0.789	0.828	105	85-115	6.40	

#### **Batch Information**

Analytical Batch: VMS13657 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Analytical Date/Time: 8/1/2013 4:57:00PM

Prep Batch: VXX25002

Prep Method: Vol. Extraction SW8260 Field Extracted L

Prep Date/Time: 8/1/2013 8:00:00AM

Prep Initial Wt./Vol.: 47.53g Prep Extract Vol: 25.00mL

Print Date: 08/12/2013 10:21:14AM



Blank ID: MB for HBN 1468958 [VXX/25004]

Blank Lab ID: 1164310

QC for Samples:

1138165001, 1138165002, 1138165003, 1138165004, 1138165005, 1138165006, 1138165007, 1138165014

#### Results by SW8260B

<u>Parameter</u>	Results	LOQ/CL	<u>DL</u>	<u>Units</u>
Benzene	0.240U	0.400	0.120	ug/L
Ethylbenzene	0.620U	1.00	0.310	ug/L
o-Xylene	0.620U	1.00	0.310	ug/L
P & M -Xylene	1.24U	2.00	0.620	ug/L
Toluene	0.620U	1.00	0.310	ug/L
Surrogates				
1,2-Dichloroethane-D4	107	70-120		%
4-Bromofluorobenzene	98.9	75-120		%
Toluene-d8	99.3	85-120		%

#### **Batch Information**

Analytical Batch: VMS13658 Analytical Method: SW8260B

Instrument: VPA 780/5975 GC/MS

Analyst: HM

Analytical Date/Time: 8/1/2013 10:13:01AM

Prep Batch: VXX25004 Prep Method: SW5030B

Prep Date/Time: 8/1/2013 8:00:00AM

Matrix: Water (Surface, Eff., Ground)

Prep Initial Wt./Vol.: 5 mL Prep Extract Vol: 5 mL

Print Date: 08/12/2013 10:21:14AM



Blank Spike ID: LCS for HBN 1138165 [VXX25004]

Blank Spike Lab ID: 1164311 Date Analyzed: 08/01/2013 11:22 Spike Duplicate ID: LCSD for HBN 1138165

[VXX25004]

Spike Duplicate Lab ID: 1164312 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1138165001, 1138165002, 1138165003, 1138165004, 1138165005, 1138165006, 1138165007,

1138165014

#### Results by SW8260B

		Blank Spike	e (ug/L)	;	Spike Duplicate (ug/L)				
<u>Parameter</u>	<u>Spike</u>	Result	Rec (%)	<u>Spike</u>	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	30	33.8	113	30	32.7	109	(80-120)	3.30	(< 20 )
Ethylbenzene	30	31.8	106	30	30.5	102	(75-125)	4.00	(< 20 )
o-Xylene	30	30.3	101	30	30.6	102	(80-120)	0.99	(< 20 )
P & M -Xylene	60	61.4	102	60	60.6	101	(75-130)	1.20	(< 20 )
Toluene	30	34.5	115	30	33.1	110	(75-120)	4.30	(< 20 )
Surrogates									
1,2-Dichloroethane-D4			94	30	95.2	95	(70-120)	1.70	
4-Bromofluorobenzene			108	30	101	101	(75-120)	7.50	
Toluene-d8			106	30	102	102	(85-120)	3.90	

#### **Batch Information**

Analytical Batch: VMS13658
Analytical Method: SW8260B

Instrument: VPA 780/5975 GC/MS

Analyst: HM

Prep Batch: VXX25004
Prep Method: SW5030B

Prep Date/Time: 08/01/2013 08:00

Spike Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL Dupe Init Wt./Vol.: 30 ug/L Extract Vol: 5 mL

Print Date: 08/12/2013 10:21:15AM



Blank ID: MB for HBN 1469363 [VXX/25007]

Blank Lab ID: 1164778

QC for Samples:

1138165001, 1138165002, 1138165003, 1138165004, 1138165005, 1138165006, 1138165007, 1138165014

Matrix: Water (Surface, Eff., Ground)

Results by AK101

ParameterResultsLOQ/CLDLUnitsGasoline Range Organics0.0620U0.1000.0310mg/L

**Surrogates** 

4-Bromofluorobenzene 93.1 50-150 %

**Batch Information** 

Analytical Batch: VFC11546 Prep Batch: VXX25007
Analytical Method: AK101 Prep Method: SW5030B

Instrument: Agilent 7890A PID/FID Prep Date/Time: 8/2/2013 8:00:00AM

Analyst: ST Prep Initial Wt./Vol.: 5 mL Analytical Date/Time: 8/2/2013 7:47:00AM Prep Extract Vol: 5 mL

Print Date: 08/12/2013 10:21:16AM



Blank Spike ID: LCS for HBN 1138165 [VXX25007]

Blank Spike Lab ID: 1164781

Date Analyzed: 08/02/2013 08:43

Spike Duplicate ID: LCSD for HBN 1138165

[VXX25007]

Spike Duplicate Lab ID: 1164782 Matrix: Water (Surface, Eff., Ground)

QC for Samples:

1138165001, 1138165002, 1138165003, 1138165004, 1138165005, 1138165006, 1138165007,

1138165014

#### Results by AK101

		Blank Spike	(mg/L)	(	Spike Dupli	cate (mg/L)			
<u>Parameter</u>	<u>Spike</u>	Result	Rec (%)	<u>Spike</u>	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.01	101	1.00	0.998	100	(60-120)	0.94	(< 20 )

#### **Surrogates**

**4-Bromofluorobenzene 99** 0.0500 99.8 **100** (50-150) **0.64** 

#### **Batch Information**

Analytical Batch: VFC11546
Analytical Method: AK101

Instrument: Agilent 7890A PID/FID

Analyst: ST

Prep Batch: VXX25007
Prep Method: SW5030B

Prep Date/Time: 08/02/2013 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

Print Date: 08/12/2013 10:21:17AM



Blank ID: MB for HBN 1469398 [VXX/25010]

Blank Lab ID: 1164941

QC for Samples:

1138165010, 1138165011, 1138165012

Matrix: Soil/Solid (dry weight)

#### Results by SW8260B

<u>Parameter</u>	<u>Results</u>	LOQ/CL	<u>DL</u>	<u>Units</u>
Benzene	0.00780U	0.0125	0.00390	mg/Kg
Ethylbenzene	0.0156U	0.0250	0.00780	mg/Kg
o-Xylene	0.0156U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0300U	0.0500	0.0150	mg/Kg
Toluene	0.0156U	0.0250	0.00780	mg/Kg
Surrogates				
1,2-Dichloroethane-D4	88.6	79-118		%
4-Bromofluorobenzene	105	67-138		%
Toluene-d8	98.2	85-115		%

#### **Batch Information**

Analytical Batch: VMS13661 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Analytical Date/Time: 8/4/2013 2:22:01PM

Prep Batch: VXX25010 Prep Method: SW5035A

Prep Date/Time: 8/4/2013 8:00:00AM

Prep Initial Wt./Vol.: 50 g Prep Extract Vol: 25 mL

Print Date: 08/12/2013 10:21:18AM



Blank Spike ID: LCS for HBN 1138165 [VXX25010]

Blank Spike Lab ID: 1164942 Date Analyzed: 08/04/2013 14:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1138165010, 1138165011, 1138165012

#### Results by SW8260B

	Blank Spike (mg/Kg)										
<u>Parameter</u>	Spike	Result	Rec (%)	<u>CL</u>							
Benzene	0.750	0.677	90	( 75-125 )							
Ethylbenzene	0.750	0.690	92	( 75-125 )							
o-Xylene	0.750	0.668	89	( 75-125 )							
P & M -Xylene	1.50	1.32	88	( 80-125 )							
Toluene	0.750	0.707	94	( 70-125 )							
Surrogates											
1,2-Dichloroethane-D4			85	( 79-118 )							
4-Bromofluorobenzene			102	( 67-138 )							
Toluene-d8			93	(85-115)							

#### **Batch Information**

Analytical Batch: VMS13661
Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Prep Batch: VXX25010
Prep Method: SW5035A

Prep Date/Time: 08/04/2013 08:00

Spike Init Wt./Vol.: 0.750 mg/Kg Extract Vol: 25 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/12/2013 10:21:19AM



#### **Matrix Spike Summary**

Original Sample ID: 1164943 MS Sample ID: 1164944 MS MSD Sample ID: 1164945 MSD Analysis Date: 08/04/2013 17:16 Analysis Date: 08/04/2013 15:15 Analysis Date: 08/04/2013 15:33 Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1138165010, 1138165011, 1138165012

#### Results by SW8260B

		Matı	ix Spike (n	ng/Kg)	Spike	Duplicate	(mg/Kg)			
<u>Parameter</u>	<u>Sample</u>	<u>Spike</u>	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.00584U	0.562	0.511	91	0.562	0.540	96	75-125	5.50	(< 20)
Ethylbenzene	0.0117U	0.562	0.505	90	0.562	0.548	97	75-125	8.10	(< 20)
o-Xylene	0.0117U	0.562	0.498	89	0.562	0.546	97	75-125	9.20	(< 20)
P & M -Xylene	0.0224U	1.12	0.992	88	1.12	1.09	97	80-125	9.20	(< 20)
Toluene	0.0141J	0.562	0.530	92	0.562	0.578	100	70-125	8.70	(< 20 )
Surrogates										
1,2-Dichloroethane-D4		0.562	0.471	84	0.562	0.511	91	79-118	8.20	
4-Bromofluorobenzene		1.50	1.05	70	1.50	1.18	79	67-138	11.50	
Toluene-d8		0.562	0.506	90	0.562	0.554	99	85-115	9.00	

#### **Batch Information**

Analytical Batch: VMS13661 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Analytical Date/Time: 8/4/2013 3:15:00PM

Prep Batch: VXX25010

Prep Method: Vol. Extraction SW8260 Field Extracted L

Prep Date/Time: 8/4/2013 8:00:00AM

Prep Initial Wt./Vol.: 66.68g Prep Extract Vol: 25.00mL

Print Date: 08/12/2013 10:21:19AM



Blank ID: MB for HBN 1469495 [VXX/25017]

Blank Lab ID: 1165647

QC for Samples:

1138165008, 1138165009, 1138165010, 1138165011, 1138165012

Matrix: Soil/Solid (dry weight)

#### Results by AK101

LOQ/CL <u>Units</u> **Parameter** Results DL Gasoline Range Organics 1.63J 2.50 0.750 mg/Kg

**Surrogates** 

4-Bromofluorobenzene 88.5 50-150 %

#### **Batch Information**

Analytical Batch: VFC11552 Analytical Method: AK101

Instrument: Agilent 7890 PID/FID

Analyst: ST

Analytical Date/Time: 8/5/2013 10:58:00PM

Prep Batch: VXX25017 Prep Method: SW5035A

Prep Date/Time: 8/5/2013 8:00:00AM

Prep Initial Wt./Vol.: 50 g Prep Extract Vol: 25 mL

Print Date: 08/12/2013 10:21:19AM



Blank Spike ID: LCS for HBN 1138165 [VXX25017]

Blank Spike Lab ID: 1165648

Date Analyzed: 08/05/2013 23:17

Spike Duplicate ID: LCSD for HBN 1138165

[VXX25017]

Spike Duplicate Lab ID: 1165649 Matrix: Soil/Solid (dry weight)

QC for Samples:

1138165008, 1138165009, 1138165010, 1138165011, 1138165012

#### Results by AK101

	E	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)				
<u>Parameter</u>	<u>Spike</u>	Result	Rec (%)	<u>Spike</u>	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	12.0	120	10.0	11.5	115	(60-120)	4.50	(< 20 )
Surrogates									
4-Bromofluorobenzene			92	1.25	90.9	91	(50-150)	0.94	

#### **Batch Information**

Analytical Batch: VFC11552
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID

Analyst: ST

Prep Batch: VXX25017
Prep Method: SW5035A

Prep Date/Time: 08/05/2013 08:00

Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Print Date: 08/12/2013 10:21:20AM



Blank ID: MB for HBN 1469559 [VXX/25019]

Blank Lab ID: 1165764

QC for Samples: 1138165013

Matrix: Soil/Solid (dry weight)

#### Results by SW8260B

<u>Parameter</u>	<u>Results</u>	LOQ/CL	<u>DL</u>	<u>Units</u>
Benzene	0.00780U	0.0125	0.00390	mg/Kg
Ethylbenzene	0.0156U	0.0250	0.00780	mg/Kg
o-Xylene	0.0156U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0300U	0.0500	0.0150	mg/Kg
Toluene	0.0156U	0.0250	0.00780	mg/Kg
Surrogates				
1,2-Dichloroethane-D4	113	79-118		%
4-Bromofluorobenzene	106	67-138		%
Toluene-d8	111	85-115		%

#### **Batch Information**

Analytical Batch: VMS13663 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Analytical Date/Time: 8/6/2013 5:04:01PM

Prep Batch: VXX25019 Prep Method: SW5035A

Prep Date/Time: 8/6/2013 8:00:00AM

Prep Initial Wt./Vol.: 50 g Prep Extract Vol: 25 mL

Print Date: 08/12/2013 10:21:21AM



Blank Spike ID: LCS for HBN 1138165 [VXX25019]

Blank Spike Lab ID: 1165765 Date Analyzed: 08/06/2013 18:05

Matrix: Soil/Solid (dry weight)

QC for Samples: 1138165013

#### Results by SW8260B

	Е	Blank Spike	(mg/Kg)	
<u>Parameter</u>	<u>Spike</u>	Result	Rec (%)	<u>CL</u>
Benzene	0.750	0.855	114	(75-125)
Ethylbenzene	0.750	0.844	113	(75-125)
o-Xylene	0.750	0.842	112	(75-125)
P & M -Xylene	1.50	1.74	116	(80-125)
Toluene	0.750	0.825	110	(70-125)
Surrogates				
1,2-Dichloroethane-D4			106	(79-118)
4-Bromofluorobenzene			109	(67-138)
Toluene-d8			109	(85-115)

#### **Batch Information**

Analytical Batch: VMS13663
Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Prep Batch: VXX25019
Prep Method: SW5035A

Prep Date/Time: 08/06/2013 08:00

Spike Init Wt./Vol.: 0.750 mg/Kg Extract Vol: 25 mL

Dupe Init Wt./Vol.: Extract Vol:

Print Date: 08/12/2013 10:21:21AM



#### **Matrix Spike Summary**

Original Sample ID: 1165766 MS Sample ID: 1165767 MS MSD Sample ID: 1165768 MSD

QC for Samples: 1138165013

Analysis Date: 08/06/2013 21:30 Analysis Date: 08/06/2013 18:56 Analysis Date: 08/06/2013 19:13 Matrix: Solid/Soil (Wet Weight)

#### Results by SW8260B

		Mat	rix Spike (n	ng/Kg)	Spike	Duplicate	(mg/Kg)			
<u>Parameter</u>	<u>Sample</u>	<u>Spike</u>	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	0.00768U	0.739	0.880	119	0.739	0.785	106	75-125	11.30	(< 20)
Ethylbenzene	0.0154U	0.739	0.858	116	0.739	0.815	110	75-125	5.10	(< 20)
o-Xylene	0.0154U	0.739	0.852	115	0.739	0.803	109	75-125	6.00	(< 20)
P & M -Xylene	0.0296U	1.48	1.79	121	1.48	1.67	113	80-125	7.20	(< 20)
Toluene	0.0154U	0.739	0.843	114	0.739	0.788	107	70-125	6.80	(< 20 )
Surrogates										
1,2-Dichloroethane-D4		0.739	0.840	114	0.739	0.755	102	79-118	10.70	
4-Bromofluorobenzene		1.97	1.95	99	1.97	1.86	94	67-138	4.80	
Toluene-d8		0.739	0.838	113	0.739	0.795	108	85-115	5.20	

#### **Batch Information**

Analytical Batch: VMS13663 Analytical Method: SW8260B

Instrument: HP 5890 Series II MS3 VNA

Analyst: HM

Analytical Date/Time: 8/6/2013 6:56:00PM

Prep Batch: VXX25019

Prep Method: Vol. Extraction SW8260 Field Extracted L

Prep Date/Time: 8/6/2013 8:00:00AM

Prep Initial Wt./Vol.: 50.76g Prep Extract Vol: 25.00mL

Print Date: 08/12/2013 10:21:22AM



Blank ID: MB for HBN 1469580 [VXX/25022]

Blank Lab ID: 1166016

QC for Samples: 1138165013

Matrix: Soil/Solid (dry weight)

#### Results by AK101

LOQ/CL Results <u>Units</u> **Parameter** DL Gasoline Range Organics 1.09J 2.50 0.750 mg/Kg

**Surrogates** 

4-Bromofluorobenzene 86.5 50-150 %

#### **Batch Information**

Analytical Batch: VFC11554 Analytical Method: AK101

Instrument: Agilent 7890 PID/FID

Analyst: ST

Analytical Date/Time: 8/6/2013 11:37:00AM

Prep Batch: VXX25022 Prep Method: SW5035A

Prep Date/Time: 8/6/2013 8:00:00AM

Prep Initial Wt./Vol.: 50 g Prep Extract Vol: 25 mL

Print Date: 08/12/2013 10:21:22AM



Blank Spike ID: LCS for HBN 1138165 [VXX25022]

Blank Spike Lab ID: 1166019 Date Analyzed: 08/06/2013 12:33

QC for Samples: 1138165013

Spike Duplicate ID: LCSD for HBN 1138165

[VXX25022]

Spike Duplicate Lab ID: 1166020 Matrix: Soil/Solid (dry weight)

Results by AK101

Blank Spike (mg/Kg				S	pike Duplic	ate (mg/Kg)			
<u>Parameter</u>	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	10.0	9.98	100	10.0	10.4	104	(60-120)	4.10	(< 20 )
Surrogates									
4-Bromofluorobenzene			91	1 25	90	90	(50-150)	0.88	

#### **Batch Information**

Analytical Batch: VFC11554
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID

Analyst: ST

Prep Batch: VXX25022
Prep Method: SW5035A

Prep Date/Time: 08/06/2013 08:00

Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Print Date: 08/12/2013 10:21:23AM



Blank ID: MB for HBN 1468876 [XXX/29522]

Blank Lab ID: 1164035

QC for Samples:

1138165001, 1138165002, 1138165003, 1138165004, 1138165005, 1138165006, 1138165007

Results by AK102

 Parameter
 Results
 LOQ/CL
 DL
 Units

 Diesel Range Organics
 0.360U
 0.600
 0.180
 mg/L

**Surrogates** 

5a Androstane 93.9 60-120 %

**Batch Information** 

Analytical Batch: XFC11005 Analytical Method: AK102

Instrument: HP 7890A FID SV E R

Analyst: EAB

Analytical Date/Time: 8/9/2013 1:08:00PM

Prep Batch: XXX29522 Prep Method: SW3520C

Prep Date/Time: 8/1/2013 9:15:00AM

Matrix: Water (Surface, Eff., Ground)

Prep Initial Wt./Vol.: 1000 mL Prep Extract Vol: 1 mL

Print Date: 08/12/2013 10:21:24AM



Blank Spike ID: LCS for HBN 1138165 [XXX29522]

Blank Spike Lab ID: 1164036

Date Analyzed: 08/09/2013 13:29

Spike Duplicate ID: LCSD for HBN 1138165

[XXX29522]

Spike Duplicate Lab ID: 1164037 Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1138165001, 1138165002, 1138165003, 1138165004, 1138165005, 1138165006, 1138165007

#### Results by AK102

		Blank Spike	e (mg/L)	;	Spike Dupli	cate (mg/L)			
<u>Parameter</u>	<u>Spike</u>	Result	Rec (%)	<u>Spike</u>	Result	Rec (%)	<u>CL</u>	RPD (%)	RPD CL
Diesel Range Organics	5	4.61	92	5	4.50	90	(75-125)	2.40	(< 20 )
Surrogates									
5a Androstane			98	0.1	94.2	94	(60-120)	4.10	

#### **Batch Information**

Analytical Batch: **XFC11005**Analytical Method: **AK102** 

Instrument: HP 7890A FID SV E R

Analyst: **EAB** 

Prep Batch: XXX29522
Prep Method: SW3520C

Prep Date/Time: 08/01/2013 09:15

Spike Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL Dupe Init Wt./Vol.: 5 mg/L Extract Vol: 1 mL

Print Date: 08/12/2013 10:21:24AM

SGS North America Inc.



Blank ID: MB for HBN 1468911 [XXX/29529]

Blank Lab ID: 1164200

QC for Samples:

1138165008, 1138165009, 1138165010

Matrix: Soil/Solid (dry weight)

#### Results by AK102

ParameterResultsLOQ/CLDLUnitsDiesel Range Organics12.4U20.06.20mg/Kg

**Surrogates** 

5a Androstane 94.3 60-120 %

#### **Batch Information**

Analytical Batch: XFC10989 Analytical Method: AK102

Instrument: HP 7890A FID SV E R

Analyst: EAB

Analytical Date/Time: 8/2/2013 11:33:00AM

Prep Batch: XXX29529 Prep Method: SW3550C

Prep Date/Time: 8/1/2013 6:30:00PM

Prep Initial Wt./Vol.: 30 g Prep Extract Vol: 1 mL

Print Date: 08/12/2013 10:21:25AM



Blank Spike ID: LCS for HBN 1138165 [XXX29529]

Blank Spike Lab ID: 1164201 Date Analyzed: 08/02/2013 11:53 Spike Duplicate ID: LCSD for HBN 1138165

[XXX29529]

Spike Duplicate Lab ID: 1164202 Matrix: Soil/Solid (dry weight)

QC for Samples:

1138165008, 1138165009, 1138165010

#### Results by AK102

	Blank Spike (mg/Kg)			S	pike Duplic	ate (mg/Kg)			
<u>Parameter</u>	Spike	Result	Rec (%)	<u>Spike</u>	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	156	94	167	153	92	(75-125)	2.10	(< 20 )
Surrogates									
5a Androstane			95	3.33	93.4	93	(60-120)	1.70	

#### **Batch Information**

Analytical Batch: **XFC10989**Analytical Method: **AK102** 

Instrument: HP 7890A FID SV E R

Analyst: **EAB** 

Prep Batch: XXX29529
Prep Method: SW3550C

Prep Date/Time: 08/01/2013 18:30

Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Print Date: 08/12/2013 10:21:26AM



Blank ID: MB for HBN 1469005 [XXX/29542]

Blank Lab ID: 1164565

QC for Samples:

1138165011, 1138165012

Matrix: Soil/Solid (dry weight)

Results by AK102

ParameterResultsLOQ/CLDLUnitsDiesel Range Organics12.4U20.06.20mg/Kg

**Surrogates** 

5a Androstane 100 60-120 %

**Batch Information** 

Analytical Batch: XFC10999 Prep Batch: XXX29542
Analytical Method: AK102 Prep Method: SW3550C

Instrument: HP 7890A FID SV E R Prep Date/Time: 8/2/2013 4:30:00PM

Analyst: EAB Prep Initial Wt./Vol.: 30 g Analytical Date/Time: 8/8/2013 12:20:00AM Prep Extract Vol: 1 mL

Print Date: 08/12/2013 10:21:26AM



Blank Spike ID: LCS for HBN 1138165 [XXX29542]

Blank Spike Lab ID: 1164566

Date Analyzed: 08/08/2013 00:40

QC for Samples: 1138165011, 1138165012

Spike Duplicate ID: LCSD for HBN 1138165

[XXX29542]

Spike Duplicate Lab ID: 1164567 Matrix: Soil/Solid (dry weight)

Results by AK102

Blank Spike (mg/Kg) Spike Duplicate (mg/Kg) <u>Parameter</u> Spike Result Rec (%) Spike Result Rec (%) RPD (%) RPD CL **Diesel Range Organics** 167 93 156 167 151 91 (75-125) 2.70 (< 20)

Surrogates

5a Androstane 99 3.33 97.1 97 (60-120) 2.20

#### **Batch Information**

Analytical Batch: **XFC10999** Analytical Method: **AK102** 

Instrument: HP 7890A FID SV E R

Analyst: **EAB** 

Prep Batch: XXX29542
Prep Method: SW3550C

Prep Date/Time: 08/02/2013 16:30

Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Print Date: 08/12/2013 10:21:27AM

#### Long, Alesha (Anchorage)

From: Dawkins, Jennifer A (Anchorage)

Sent: Thursday, August 01, 2013 11:28 AM

**To:** Long, Alesha (Anchorage) **Subject:** 8165 Sample ID changes

I have made the following changes to IDs for WO 8165, per client:

Sample 8 - SB-13-01(7.1-8.1) Sample 9 - SB-13-02(6.25-7.5) Sample 10 - SB-13-03(5.6-6.5) Sample 11 - SB-13-04(5.25-6.5) Sample 12 - SB-23-04(5.25-6.5)

Feedback? env.alaska.feedback@sgs.com

#### Jennifer A-B Dawkins

Alaska Division Fairbanks Project Manager

SGS North America Inc.

3180 Peger Rd. Ste. 190 Fairbanks, Alaska 99709

Phone: (907) 474-8656

Cell: (907) 322-8444

Fax: (907) 474-9685

E-mail: jennifer.dawkins@sgs.com

Web: <u>www.us.sgs.com</u>

Data Deliverables At: <a href="https://engage.sgs.com/labds/">https://engage.sgs.com/labds/</a>

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Time

1949 1925

2230

1556 2220

1459

Richland, WA 99352

Date

Sample

#### SHANNON & WILSON, INC.

Geotechnical and Environmental Consultants

Seattle, WA 98103 (206)-632-8020

2355 Hill Road Fairbanks, AK 99709 (907) 479-0600

2255 S.W. Canyon Road Portland, OR 97201-2498 (503) 223-6147

Sample Identity

mw-10-07 MW-10-03

mw-10-12

400 N. 34th Street, Suite 100 2043 Westport Center Drive St. Louis, MO 63146-3564 (314) 699-9660

> 5430 Fairbanks Street, Suite 3 Anchorage, AK 99518 (907) 561-2120

1200 17th Street, Suite 1024 Denver, Co 80202 (303) 825-3800

H-A(I)

4-AP

Lab No.

**DY RECORD** 

Page\_ Laboratory\_545 Attn: Ten

Analysis Parameters/Sample Container Description (include preservative if used)

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Project Information	Sample Receipt						
Project Number: 1551-005	Total Number of Containers						
Project Name: Pitro Star	COC Seals/Intact? Y/N/NA						
Contact: TAL	Received Good Cond./Cold						
Ongoing Project? Yes No 🗆	Delivery Method:						
Sampler: SYZ	(attach shipping bill, if any)						
Instructions							
Requested Turnaround Time:	ΓD						
Special Instructions: Bill to Sharmaghilson, Inc.							
Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report Yellow - w/shipment - for consignee files							

Pink - Shannon & Wilson - Job File

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signatura Time: 2 24 13	Signature: Time: 1615	Signature: Time:
Printed Name: Date: 1330  Supplies Date: 1330	Printed Name: Date: 7/29/13 KUN WA KVY	Printed Name: Date:
Company: Sw T	Company: 565	Company:
Received By: 1.	Received By: 2.	Received By: 3.
Signature: Time: 1330	Signature: Time:	Signature: Time 8-50
Printed Name: Date: 7/29/13 Kunda Fry	Printed Name: Date:	Printed Name: Date: 7/3/13  St Phone Charley
Company:	Company:	Company: 5G5

F-19-91/UR

JB1=3.0°C 10240 7B2=4.6°C

10 241

No.\_31326





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#### SHANNON & WILSON, INC.

Geotechnical and Environmental Consultants

Seattle, WA 98103 (206) 632-8020

2355 Hill Road Fairbanks, AK 99709 (907) 479-0600

400 N. 34th Street, Suite 100 2043 Westport Center Drive St. Louis, MO 63146-3564 (314) 699-9660

303 Wellsian Way Richland, WA 99352

(509) 946-6309

5430 Fairbanks Street, Suite 3 Anchorage, AK 99518 (907) 561-2120

CHAIN-U

**RECORD** 

Page Z of Z Laboratory 565 Attn:\_\_\_\_

Analysis Parameters/Sample Container Description (include preservative if used)

ortland, OR 97201-2498 De	00 17th Street, Suite 1024 enver, Co 80202 03) 825-3800		Date	/8°/		Sap Dan	A. A	//		Remarks/Matrix	
Sample Identity	Lab No.	Time	Sampled	<u>/%/&amp;</u>	<u>~~~</u>	<u>/{\O^{\chi}}</u>	<u> </u>		149	Remarks/Matrix	
5B-13-03(5.6-6.	50 (10) A-B	1655	7/28/13	X	×	X	×		2	5011	
5B-13-04 5.25-6	50 (1) A-B	1741							2		
58-23-04 (5.25-6	.50 (12) A-B	1736	7	7	\\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	V	4		2	<u> </u>	
TRIPBLANK	(TEBA-C	· A CONTROL OF THE PARTY OF THE			*		X		3	water	
Trip Blank	BA				χ		X		1	Soil	
· · ·											

Project Information	Sample Receipt							
Project Number: 1551-005	Total Number of Containers							
Project Name: Petro Stav	COC Seals/Intact? Y/N/NA							
Contact: +AL	Received Good Cond./Cold							
Ongoing Project? Yes No	Delivery Method:							
Sampler: ジソル	(attach shipping bill, if any)							
Instructions								
Requested Turnaround Time:	5170							

Project Information	Sample Receipt	Relinquish	ed By: 1.	Relinqui	shed By: 2.	Relinqui	shed By: 3.
Project Number: 1551-005	Total Number of Containers	Signature:	Time: )330	Signature:	Time: 1615	Signature:	Time:
Project Name: Petro Star	COC Seals/Intact? Y/N/NA	Printed Name:		Printed Name:	Date: 7/29/L3	Printed Name:	Date:
Contact: +AL	Received Good Cond./Cold	Sith Robin	Date: 7 -4 13	Kendra	Frey		Baile
Ongoing Project? Yes V No	Delivery Method:	Company:		Company:		Company: <	
Sampler: 37 R	(attach shipping bill, if any)	SWI		565			
Instru	ctions	Received I	3y: 1.	Receive	d By: 2.	Received	
Requested Turnaround Time:	5170	Signature:	Time: 1330	Signature:	Time:	Signature:	Time: 8:50
Special Instructions:		kla	<i>6</i> 27			S/C /	8
Bill to Shanming	wilson, Inc.	Printed Name:	Date 7/29/13	Printed Name:	Date:	Printed Name:	Date: 1/3/1
Distribution: White - w/shipment - returne Yellow - w/shipment - for cor Pink - Shannon & Wilson - Jo		Company:		Company:		Company:	5

F-19-91/UR

No. 31327



# 1138165

#### SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were <b>custody seals</b> intact? Note # & location, if applicable.	Yes No N/A	
COC accompanied samples?	Yes No N/A	
<b>Temperature blank</b> compliant* (i.e., 0-6°C after correction factor)?	Yes No N/A	
	LES NO NA	
* Note: Exemption permitted for chilled samples collected less than 8 hours ago.		
Cooler ID: @		
Cooler ID: 2 @ 4.6°C w/ Therm.ID: 24(		
Cooler ID: @ w/ Therm.ID:		
Cooler ID: @ w/ Therm.ID:		
Cooler ID: @ w/ Therm.ID:		
Cooler ID: w/ Internit.ID:		
Note: If non-compliant, use form FS-0029 to document affected samples/analyses.		
If samples are 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."		
If temperature(s) <0°C, were all sample containers ice free?	Yes No N/A	)
Delivery method (specify all that apply): Client	Note ABN/	
USPS Alert Courier C&D Delivery AK Air	tracking #	
Lynden Carlile ERA PenAir		
FedEx UPS NAC Other:	See Attached	
	or N/A	
→ For WO# with airbills, was the WO# & airbill		
info recorded in the Front Counter eLog?	Yes No NA	
→ For samples received with payment, note amount (\$ ) and ca		rircle one) or note:
→ For samples received in FBKS, ANCH staff will verify all criteria		SRF Initiated by: KF N/A
		SKr illitated by. R F 19/A
Were samples received within hold time?	Yes No N/A	
Note: Refer to form F-083 "Sample Guide" for hold time information.	<u> </u>	
Do samples <b>match COC*</b> (i.e., sample IDs, dates/times collected)?	Yes No N/A	
* Note: Exemption permitted if times differ <1hr; in which case, use times on COC.		
Were analyses requested unambiguous?	Yes No N/A	
Were samples in <b>good condition</b> (no leaks/cracks/breakage)?	Yes No N/A	
Packing material used (specify all that apply): Bubble Wrap		
Separate plastic bags Vermiculite Other:		
Were all VOA vials free of headspace (i.e., bubbles $\leq 6$ mm)?	Yes No N/A	
Were all soil VOAs field extracted with MeOH+BFB?	Yes No N/A	
Were <b>proper containers</b> (type/mass/volume/preservative*) used?	Yes No N/A	
* Note: Exemption permitted for waters to be analyzed for metals.		
Were <b>Trip Blanks</b> (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No N/A	Limited Volume for water
		FINALLOW ADJUNDED TO MEND
For special handling (e.g., "MI" or foreign soils, lab filter, limited	Yes No N/A	
volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?		
For preserved waters (other than VOA vials, LL-Mercury or	Yes No N/A	
microbiological analyses), was pH verified and compliant?		
If pH was adjusted, were bottles flagged (i.e., stickers)?	Yes No N/A	)
For RUSH/SHORT Hold Time, were COC/Bottles flagged	Yes No NA	
	TES NO INTA	
accordingly? Was Rush/Short HT email sent, if applicable?		
For SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP, were	Yes No (N/A)	
containers / paperwork flagged accordingly?		
For any question answered "No," has the PM been notified and the	Yes No (N/A)	SRF Completed by: SLC 7/31/17
problem resolved (or paperwork put in their bin)?		PM = N/A
Was PEER REVIEW of sample numbering/labeling completed?	Yes No N/A	Peer Reviewed by: N/A
	TES NO WA	Feel Reviewed by. IVA
Additional notes (if applicable):		
Note to Client: Any "no" circled above indicates non-comp	liance with standa	rd procedures and may impact data quality.



SGS WO#

1138165

#### SAMPLE RECEIPT FORM FOR TRANSFERS

Note: This form is to be completed by Anchorage Sample Receiving staff for all shipments received at SGS-Anchorage from SGS-Fairbanks.

Were samples received numbered with all criteria on Sample Receipt	Yes (No) N/A	
Form F0004 documented by Fairbanks Sample Receiving staff?		Use space below
If "No," Anchorage Sample Receiving staff must complete the		for additional notes
receiving process & document pH verification, sample condition,		
etc. on the SRF initiated by Fairbanks staff (attached).		
Review Criteria:	Condition:	Commonto/Action Tolone
		Comments/Action Taken:
Were custody seals intact?	(Yes) No N/A	IF IB
Note # & location:		
COC accompanied samples?	(Yes) No N/A	
Temperature blank compliant (i.e., 0-6°C after correction factor)?	Yes No N/A	
Cooler ID: 1 @ 4.7 w/ Therm.ID: 239		
Cooler ID:       1       @ 4.7       w/ Therm.ID: 239         Cooler ID:       2       @ 5 9       w/ Therm.ID: 238		
Cooler ID: w/ Therm.ID:		
Cooler ID: @ w/ Therm.ID:		
Cooler ID: @ w/ Therm.ID:		
Note: If non-compliant, use form FS-0029 to document affected samples/analyses.		
If samples are 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 <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled."		
If temperature(s) <0°C, were all containers ice free?	Yes No (N/A)	
Delivery method: Lynden		
Other:		
Completed by:		
	ondere an	

### **Laboratory Data Review Checklist**

Title: Geologist II Date: August 30, 2014  CS Report Name: Petro Star ULSD Release Report Date: April 30, 2014  Consultant Firm: Shannon & Wilson, Inc.  Laboratory Name: SGS North America, Inc. Laboratory Report Number: 1138165
Consultant Firm: Shannon & Wilson, Inc.
Laboratory Name: SGS North America Inc Laboratory Report Number: 1138165
1130103
ADEC File Number: ADEC RecKey Number:
1. <u>Laboratory</u> a. Did an ADEC CS approved laboratory receive and <u>perform</u> all of the submitted sample analyses?    Yes   No   NA (Please explain.)   Comments:
b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?
<ul> <li>2. Chain of Custody (COC) <ul> <li>a. COC information completed, signed, and dated (including released/received by)?</li> <li>□ No □ NA (Please explain.) Comments:</li> </ul> </li> <li>However, Shannon &amp; Wilson all sample names be changed via email after samples were delivered to SGS. This does not affect data quality or usability.</li> </ul>
b. Correct analyses requested?  Yes No NA (Please explain.)  Comments:
3. <u>Laboratory Sample Receipt Documentation</u> a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?  Yes No NA (Please explain.)  Comments:  Samples were received at the Fairbanks receiving office and Anchroage laboratory within the acceptable temperature range listed on this checklist.

	b.	Sample preservation acceptable – acidified waters, Me Volatile Chlorinated Solvents, etc.)?	thanol preserved VOC soil (GRO, BTEX,
			Comments:
	_		
	c.	Sample condition documented – broken, leaking (Meth   ☐ Yes ☐ No ☐ NA (Please explain.)	nanol), zero headspace (VOC vials)?  Comments:
		Samples were received in good condition.	
	d.	containers/preservation, sample temperature outside of samples, etc.?	Cacceptable range, insufficient or missing
		☐Yes ☐ No ☐NA (Please explain.)	Comments:
		There were no sample-receiving discrepancies identified	by the lab.
	e.	Data quality or usability affected? (Please explain.)	Comments:
	1	No; see above.	
4. (	ase l	Narrative	
		Present and understandable?  No NA (Please explain.)	Comments:
	b.	Discrepancies, errors or QC failures identified by the la \( \subseteq \text{Yes} \subseteq \text{No} \subseteq \text{NA (Please explain.)} \)	ab? Comments:
		The case narrative notes that samples MW-10-02 and M veathered gasoline. Data quality is not affected by this old	1
	C.	Were all corrective actions documented?  ☐Yes ☐ No ☐NA (Please explain.)	Comments:
	1	No corrective actions were required.	
	d.	What is the effect on data quality/usability according to	o the case narrative? Comments:
	1	None, see above.	
5. <u>s</u>	_	les Results Correct analyses performed/reported as requested on C	COC? Comments:
	_		

0.	Yes No NA (Please explain.)	Comments:
c.	All soils reported on a dry weight basis?  ⊠Yes □ No □NA (Please explain.)	Comments:
d.	Are the reported PQLs less than the Cleanup Level or project?	r the minimum required detection level for the
	Yes No NA (Please explain.)	Comments:
	LODs (reporting value) were below the ADEC establish oplicable (for non-detect results).	hed groundwater cleanup levels, where
e.	Data quality or usability affected?	Comments:
1	No, see above.	
. QC Sa a.	mples Method Blank i. One method blank reported per matrix, analys  ⊠Yes □ No □NA (Please explain.)	sis and 20 samples? Comments:
	ii. All method blank results less than PQL?  ∑Yes ☐ No ☐NA (Please explain.)	Comments:
	However, GRO was detected in the method blank at a CXX25017) and 1.09J mg/kg (prep batch VXX25022).	
	iii. If above PQL, what samples are affected?	

Samples analyzed in the same "prep batch" as the method blank (MB) which have concentrations within five times the MB concentration are considered non-detect. Each sample reported in GRO prep batches VXX25017 and VXX25022 had concentrations below the LOQ and within five times the associated MB concentration. Affected samples reported below the LOQ are considered non-detect at the LOQ and flagged with a 'UB'. Sample results for the following samples are considered affected: SB-13-01(7.1-8.1), SB-13-02(6.25-7.5), SB-13-03(5.6-6.5), SB-13-04(5.25-6.5), SB-23-04(5.25-6.5) and the soil Trip Blank.

Comments:

iv. Do the affected sampl  ☐Yes ☐ No ☐NA (Ple		and if so, are the data flags clearly defined?  Comments:
Yes; see above.		
v. Data quality or usabili	ity affected? (Please	explain.) Comments:
Yes; see above.		
o. Laboratory Control Sample/D	Ouplicate (LCS/LCSI	D)
required per AK meth	ods, LCS required p	natrix, analysis and 20 samples? (LCS/LCSD er SW846)
⊠Yes ☐ No ☐NA (Ple	ease explain.)	Comments:
LCS/LCSD samples were reported for BTEX analysis, a M	-	and DRO. In cases where only the LCS was was also analyzed.
ii. Metals/Inorganics – or samples?	ne LCS and one sam	ple duplicate reported per matrix, analysis and 2
☐Yes ☐ No ☒NA (Ple	ease explain.)	Comments:
Samples were not submitted for	metal/inorganic ana	alyses.
And project specified	DQOs, if applicable K103 60%-120%; a	eported and within method or laboratory limits?  (AK Petroleum methods: AK101 60%-120%, ll other analyses see the laboratory QC pages)  Comments:
laboratory limits? And	d project specified D D, and or sample/sam laboratory QC pages	s (RPD) reported and less than method or QOs, if applicable. RPD reported from uple duplicate. (AK Petroleum methods 20%; als)  Comments:
v. If %R or RPD is outsi	de of acceptable lim	its, what samples are affected?  Comments:
N/A; percent recoveries and RF	PDs were within cont	trol limits.

	vi. Do the affected sample(s) have data flags?  Yes No NA (Please explain.)	If so, are the data flags clearly defined?  Comments:
No s	ample results were affected; see above.	
	vii. Data quality or usability affected? (Use co	mment box to explain.) Comments:
Data	quality or usability was not affected; see above	2.
c. Su	rrogates – Organics Only	
	i. Are surrogate recoveries reported for organ Yes No NA (Please explain.)	nic analyses – field, QC and laboratory samples?  Comments:
	And project specified DQOs, if applicable analyses see the laboratory report pages)	eported and within method or laboratory limits? . (AK Petroleum methods 50-150 %R; all other
	Yes No NA (Please explain.)	Comments:
	<ul><li>iii. Do the sample results with failed surrogate flags clearly defined?</li><li>☐ Yes ☐ No ☐NA (Please explain.)</li></ul>	e recoveries have data flags? If so, are the data  Comments:
TPI		Comments.
Iner	re were no surrogate recovery failures.	
	iv. Data quality or usability affected? (Use the	e comment box to explain.) Comments:
No;	see above.	
d. Tri		, Volatile Chlorinated Solvents, etc.): Water and
	i. One trip blank reported per matrix, analysi (If not, enter explanation below.)	is and for each cooler containing volatile samples
	Yes No NA (Please explain.)	Comments:

If not, a comment explaining why must be ⊠Yes ☐ No ☐NA (Please explain.)	1 7
Although the COC does not indicate that the trip blan vials, the sample-receipt form does indicate that the tr VOA vials.	
<ul><li>iii. All results less than PQL?</li><li>∑Yes ☐ No ☐NA (Please explain.)</li></ul>	Comments:
However, GRO was detected at a concentration of 0.9 also a method blank detection in the same prep batch a blank detection is attributed to the method blank detection other analytes were detected in the trip blanks.	as the soil trip blank. In our opinion, the trip
iv. If above PQL, what samples are affected?	Comments:
N/A; see above.	
v. Data quality or usability affected? (Please e.	explain.) Comments:
No; see above.	
e. Field Duplicate	
i. One field duplicate submitted per matrix, an   ☐Yes ☐ No ☐NA (Please explain.)	nalysis and 10 project samples?  Comments:
Field duplicate set SB-13-04(5.25-6.5)/SB-23-04(5.2	(5-6.5) was submitted with this project.
ii. Submitted blind to lab?  ∑Yes ☐ No ☐NA (Please explain.)	Comments:

iii. Precision – All relative percent differences (RPD) less than specified DQOs? (Recommended: 30% water, 50% soil)	
RPD (%) = Absolute value of:	$(R_1-R_2)$
	${((R_1+R_2)/2)}$ x 100
Where $R_1 = Sample Concent$	atration
$R_2 = \text{Field Duplicate}$	
Yes No NA (Please explain	n.) Comments:
RPDs, where calculable, were calculated by	below 30%.
iv. Data quality or usability affected	d? (Use the comment box to explain why or why not.)
	Comments:
Data quality and usability were not affected	ed; see above.
·	
f. Decontamination or Equipment Blank (I	If not used explain why).
☐Yes ☐ No ☐NA (Please expl	· · · · · · · · · · · · · · · · · · ·
No reusable equipment was used to collect	the samples; an equipment blank is not required.
i. All results less than PQL?	
☐Yes ☐ No ☒NA (Please explain	n.) Comments:
N/A; see above.	
ii. If above PQL, what samples are	affected?
	Comments:
N/A.	
IV/A.	
iii. Data quality or usability affected	d? (Please explain.)
	Comments:
N/A; see above.	
7. Other Data Flags/Qualifiers (ACOE, AFCEE, I a. Defined and appropriate?	_ab Specific, etc.)
<ul> <li>a. Defined and appropriate?</li> <li>☐Yes ☐ No ☒NA (Please explain</li> </ul>	(n.) Comments:
There were no other data flags/qualifiers.	



Attachment to and part of Report: 31-1-11551-005

Date: June 20, 2014

To: Petro Star, inc.
Attn. Lisa Lewis

Re: ULSD Release, Additional Soil and Groundwater Characterization

## IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL REPORT

#### CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

#### THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors which were considered in the development of the report have changed.

#### SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

#### MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

Page 1 of 2 1/2014

#### A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

#### THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

#### BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

#### READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland

Page 2 of 2 1/2014