BGES, INC.

ENVIRONMENTAL CONSULTANTS

FORMER HANNA CAR CARE CENTER
180 MULDOON ROAD
ANCHORAGE, ALASKA

GROUNDWATER MONITORING AND SOIL SAMPLING REPORT

February 2016

Submitted to:

Mr. Tony Kim
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Submitted by:

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TABLE OF CONTENTS

FIGURES (Located at End of report)

TABLES (Located at End of Report)

APPENDICES (Located at End of Report)

ACRONYMS

ADEC	-	Alas ka Department of Environmental Conservation
AK	-	Alaska Method
AWWU	-	Anchorage Water & Wastewater Utility
BGES	-	Braunstein Geological and Environmental Services
BTEX	-	Benzene, Toluene, Ethylbenzene, and Xylenes
C	-	Celsius
DRO	-	Diesel Range Organics
EPA	-	Environmental Protection Agency
IDW	-	Investigation Derived Waste
GRO	-	Gasoline Range Organics
LOQ	-	Limit of Quantitation
mg/L	-	Milligrams per Liter
ml/min	-	Milliliters per minute
QC	-	Quality Control
QP	-	Qualified Person
RPD	-	Relative Percent Difference
RS&E	-	Restoration Science & Engineering
SGS	-	SGS North America, Inc.
UST	-	Underground Storage Tank

1.0 INTRODUCTION

BGES, Inc. (BGES) was retained by Mr. Tony Kim, owner of the former Hanna Car Care Center, to conduct groundwater sampling at this facility located at 180 Muldoon Road in Anchorage, Alaska; hereafter referred to as "the site" (Figure 1). The purpose of this sampling was to assess the groundwater quality, as well as to characterize the current condition of subsurface soils at the site (with respect to contaminant concentratios). The fieldwork for the groundwater sampling effort was performed during July of 2015 (Groundwater) in general accordance with Alaska Department of Environmental Conservation (ADEC) requirements and regulations. The, soil sampling effort was conducted in December of 2015 in general accordance with our approved Work Plan dated November 2015. The site is an "active" ADEC Contaminated Site; with the Hazard Identification Number 23821; Event Identification Number: 95; File Number: 2100.26.204; and Reckey Number: 1989210016401.

2.0 BACKGROUND

The site is located at the northwest corner of the intersection of Peck Avenue and Muldoon Road, in the northeast portion of Anchorage, Alaska (Figure 1). The property has operated for many years as a service station and a car wash. Fuel is no longer dispensed at the site, and the former fuel tanks were removed in 1999. A one-story building that currently serves as an auto repair shop and laundromat is located on the property. The general layout of the site is shown on Figure 2.

Numerous previous assessments have been performed by various environmental consulting firms at the site. The most recent assessments include a 2003 Site Assessment performed by Restoration Science and Engineering (RS&E) that was designed to evaluate the magnitude and extent of hydrocarbon contamination at the site. A subsequent report prepared in 2003 by RS&E, issued as a follow-up to their 2003 Site Assessment report, presented remedial options for the site. The recommended approach was to construct an air sparge/vapor extraction system. A design was then prepared for this system.

BGES was contracted in 2004 to perform a Phase I Environmental Site Assessment, which evaluated current (at that time) site conditions and summarized previous assessment work. BGES reviewed the previous assessment work performed at the site, including the recommended remedial option and associated remedial design, and provided recommended modifications to the proposed course of action. BGES recommended that another round of groundwater sampling be performed prior to determining a future course of action or implementing the proposed remediation program at the site, since groundwater

sampling had not been conducted for approximately one year. BGES performed groundwater monitoring activities in April of 2004. Ongoing groundwater monitoring activities were conducted between 2004 and July of 2015.

In response to the report associated with the March of 2015 groundwater-monitoring event, the ADEC requested that an additional groundwater-sampling event take place in addition to subsurface soils characterization, to consider the site for a "cleanup complete with institutional controls" status. This report documents the results of the latest round of groundwater sampling and soil sampling activities, completed in July and December of 2015.

3.0 PREVIOUS SITE WORK

RS&E and Northern Petroleum Services personnel removed four registered underground storage tanks (USTs) and five unregistered USTs in the fall/winter of 1999 at the site. Nine USTs were reported to be removed, cleaned and properly disposed of through Newell Recycling. Soil samples that exhibited concentrations of petroleum hydrocarbons in excess of the ADEC Method 2 migration to groundwater cleanup criteria, were collected from the following locations: beneath the east and west ends [approximate depth of 14.5 feet below grade (bg)] of former UST Number 9; beneath the east end (depth of 10.5 feet bg) of former UST Number 5; beneath the west end (depth of 13 feet bg) of former UST Number 7; and from the east sidewall (depth of 7 feet bg) adjacent to former UST Number 8. Excavation activities included the removal of approximately 640 gallons of fluid (water and product mixture) from the USTs and approximately 142 cubic yards of contaminated soils. RS&E reported that 22 cubic yards of the 142 cubic yards of contaminated soils were transported off-site and placed in long-term storage cells at the Hanna Car Care Center Dimond location. Approximately 120 cubic yards of contaminated soil were also stockpiled at the Muldoon property and the method of disposal was not reported by RS&E.

RS&E conducted a soil and groundwater characterization at the site during the winter and spring of 2003. The objective of the investigation was to delineate the horizontal and vertical extent of hydrocarbon-impacted soils and groundwater. Concentrations of benzene, the contaminant of concern for the site, were detected above cleanup levels in the smear zone for Soil Borings BH-5, BH-6 and Monitoring Wells MW-8, MW-9 and MW-10. Monitoring Wells MW-8 and MW-9 were installed in boreholes that were advanced outside of the UST excavation limits and adjacent to the north property boundary. Monitoring Well MW-10 was installed in a soil boring advanced within the UST excavation

limits, approximately 25 feet southeast of Soil Boring BH-4. Soil Borings BH-4 and BH-5 were advanced outside the limits of the excavation and approximately 20 feet northeast and 30 feet southeast of Monitoring Well MW-6, respectively. Elevated concentrations of gasoline range organics (GRO), diesel range organics (DRO), and benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in remaining soils; and grab groundwater samples were collected from within the excavations.

Groundwater sampling was performed by RS&E during February of 2003. Monitoring wells MW3 through MW11, and TW1 through TW3 (temporary monitoring wells) were sampled. The results indicated that concentrations of GRO in Monitoring Wells MW7, MW9, and MW10; and benzene in MW7 and MW9; exceeded ADEC cleanup levels. The April 2004 sampling event revealed GRO, DRO, and benzene concentrations in Monitoring Well MW7 that exceeded ADEC cleanup criteria. Monitoring Wells MW2, MW4, and MW10 were ultimately decommissioned by filling them with cement on June 9, 2004.

Since 2004, BGES has performed 13 groundwater sampling events at this site using existing monitoring wells. Only Monitoring Well MW7 has consistently exhibited concentrations of GRO, DRO, and BTEX constituents exceeding the ADEC cleanup criteria, until the monitoring event on October 31, 2014 (none of the analytes from the samples collected during this event exceeded the applicable ADEC cleanup criteria).

Another groundwater monitoring event was performed in July of 2015; the results of this monitoring event are presented below. Additionally, in an effort to characterize the remaining contaminant concentrations within the subsurface soils at the subject property, soil samples were collected from eight soil borings that were advanced in December of 2015. The results of these activities are described below.

4.0 GROUNDWATER AND SOIL SAMPLING ACTIVITIES

BGES collected groundwater samples from Monitoring Wells MW7, MW9, and MW26 on July 1, 2015 (Figure 2). Additionally soil samples were collected from eight soil borings, which were advanced on December 2, 2015.

4.1 July 2015 Groundwater Sampling

Prior to sample collection, the depths to water and the total depths of each accessible well were measured using an electronic water level indicator that was decontaminated prior to its use in each well by washing it in an Alconox (laboratory-grade detergent) solution, followed by a potable water rinse. The depth to water, the total depth of the wells, and the water quality parameters are presented in Table 1. It should also be noted that several of the wells were slightly damaged and/or exhibited evidence of frost-jacking, and that the well casing of Monitoring Well MW3 was trimmed in order to replace the expandable plug at the top of the well. Because of this, the groundwater elevations measured during this sampling event should be considered approximations, and we were not able to calculate the groundwater flow direction or gradient with any confidence for this sampling event. Previous measurements at the site have consistently indicated a groundwater flow direction that is generally northwesterly.

Prior to the collection of groundwater samples, the casing volume for each well was calculated. Groundwater was purged from each well utilizing a positive displacement bladder pump. The groundwater samples were collected from Monitoring Wells MW7, MW9 and MW26 after at least three well volumes were purged, in accordance with the ADEC Field Sampling Guidance (May 2010). During the purging activities, water quality parameters (pH, conductivity, oxidation-reduction potential, and temperature) were monitored, utilizing a YSI Professional Plus Multi-Parameter water quality meter. The field data gathered during purging are listed in Table 1.

During the purging and sampling activities, the bladder pump intake was set within the top six inches of the groundwater surface and the pumping rate utilized during the purging activities was approximately 150 milliliters per minute (ml/min). After completion of the purging activities, the portions of the groundwater samples scheduled for volatile analyses were collected first by filling laboratory-supplied containers that were preserved with hydrochloric acid. Care was exercised to ensure that no headspace was created within the laboratory vials, and that none of the preservative spilled from the vials destined for volatile analyses.

The sample containers were labeled, placed in chilled coolers, and transported to SGS North America, Inc. (SGS), an ADEC-approved laboratory for analysis, under chain of custody protocol. As a quality control measure, a trip blank sample accompanied the water samples scheduled for volatile analyses during the entire sampling and handling process.

Investigation-derived waste (IDW) generated during this sampling effort (purge water) was containerized in two five-gallon buckets, which are currently stored inside the facility. The buckets were clearly labeled with contact information for Mr. Kim and a description of the contents (potentially-contaminated water). In addition, Mr. Kim was notified of the importance of maintaining the integrity of these wastes until the analytical results were received and permission to dispose of the water was received from the ADEC. Site photographs are included in Appendix A; copies of field notes are included in Appendix B; and copies of groundwater monitoring logs are included in Appendix C.

4.2 December 2015 Soil Sampling

Field work for the additional site characterization activities was performed by Kris Shippen and Rose Pollock, Environmental Scientists of BGES; in accordance with our ADEC-approved work plan. The soil boring activities were conducted on December 2, 2015. The following paragraphs discuss these activities.

Prior to advancement of the soil borings, BGES personnel coordinated with the One-Call utility locate service to locate and mark subsurface utilities in the project area.

BGES's field personnel observed and documented the advancement of eight soil borings, which were advanced in locations specified and approved by the ADEC, at the subject property on December 2, 2015 (Figure 3). The borings were advanced using a GeoProbe 6620DT direct-push drilling rig provided by GeoTek Alaska, Inc. (GeoTek) of Anchorage, Alaska. Static and percussion forces were utilized to advance a five-foot long Macro-Core (MC) sampler into subsurface soils. The MC sampler contained a fitted plastic sleeve used to capture the soils continuously from the surface to the maximum depth of each boring. The soil borings, which were designated based on their proximity to existing or historical monitoring wells, were advanced to 25 feet below grade (bg).

Upon retrieval, a portion of each sample was placed in laboratory-supplied containers utilizing a clean, stainless steel spoon, for possible submittal for laboratory analysis. The portions of the samples scheduled for volatile contaminant constituent analyses were collected first, and were preserved with methanol immediately after collection. The methanol provided by the laboratory was added to the sample in a manner that completely covered the sample.

A second portion of the recovered soil sample from each MC sampler was placed into a sealable plastic bag using a clean, stainless steel spoon, and labeled with a unique sample number and the time of

collection. Soils in each plastic bag were screened with a photoionization detector (PID) that was calibrated prior to use with 100 parts per million (ppm) isobutylene calibration gas. The samples were allowed to warm in a vehicle to at least 40 degrees Fahrenheit for at least 10 minutes, but no longer than 1 hour. The plastic bags were then agitated for approximately 15 seconds, at which point the probe of the PID was inserted into each bag and the greatest reading was recorded.

The samples were labeled, placed in ice-filled coolers, and delivered by BGES personnel under chain of custody protocol to SGS North America, Inc. (SGS) of Anchorage, Alaska, an ADEC-approved laboratory. Site photographs are included in Appendix A; Field notes describing the soil boring activities are included in Appendix B; and the soil descriptions and PID readings for samples collected from each soil boring were described and recorded in soil boring logs included in Appendix C. All soil sampling activities were conducted in general accordance with ADEC Field Sampling Guidance, dated October 2014.

A total of 76 soil samples (including two duplicate soil samples), were collected from Soil Borings SB2B, SB3B, SB6B, SB7B, SB7C, SB9B, SB11B, and SB11C (Figure 3); nine of which (including one duplicate) were submitted for laboratory analyses. The soils in Soil Borings SB6B, and SB11C exhibited visual evidence of petroleum contamination during the advancement of the soil borings and collection of the soil samples. Light odors were observed during the collection of soil samples from SB2B, SB3B, SB7B, and SB11B; and moderate to strong odors were observed during the collection of soil samples from SB7C, SB9B, and SB11C. PID readings ranged from 0 to greater than 1,000 parts per million. After completion of the soil borings, they were backfilled with bentonite chips to a depth of 2 feet bg, and pea gravel from 2 feet bg to the surface. Additionally, Soil Borings SB3B and SB6B, which were advanced through asphalt, were capped with approximately 4 inches of cold-setting asphalt. Soils generated as IDW during the soil boring activities were stored in a steel drum on site until the analytical results were received and permission to dispose of the soil was received from the ADEC.

The soil samples exhibited sands and gravels, with varying amounts of fine-grained material in all depth intervals. Groundwater was encountered between 15 to 20 feet bg in all of the soil borings. Soil samples were selected for laboratory analyses based on their vertical location relative to the soil-groundwater interface or “smear zone”, and their PID readings.

5.0 EVALUATION OF LABORATORY DATA

Laboratory analysis of the soil and groundwater samples was performed by SGS, an ADEC-approved laboratory. The analytical results for the water samples are listed in Table 2, and a copy of the laboratory data is included in Appendix D. The analytical results for the water samples were compared to the ADEC Method 2 Cleanup Criteria listed in Alaska Administrative Code (AAC) 75.345—Table C for groundwater.

The analytical results for the soil samples are listed in Table 3 and a copy of the laboratory data is included in Appendix D. The analytical results for soil samples were compared to the applicable, most stringent ADEC Method 2 Cleanup Criteria listed in AAC 75.345–Tables B1 & B2.

5.1 Groundwater Samples

The water samples were analyzed at SGS by the following methods: GRO by Alaska Method (AK) 101; DRO by AK 102; and BTEX by Environmental Protection Agency (EPA) Method 8021B.

The water samples collected from the site were labeled, for example, MW7-0701, where the prefix MW7 indicates the monitoring well from which the water sample was collected; and 0701 indicates the month and day the sample was collected.

Water Sample MW7-0701 contained a concentration of; GRO at 0.369 mg/L, which is nearly an order of magnitude less than the applicable ADEC cleanup criterion of 2.2 mg/L for this analyte; benzene at 0.00278 mg/L, which is less than the applicable ADEC cleanup criterion of 0.005 mg/L for this analyte; ethylbenzene at 0.00315 mg/L, which is more than two orders of magnitude less than the applicable ADEC cleanup criterion of 0.7 mg/L for this analyte; and total xylenes at 0.00429 mg/L (estimated), which is more than four orders of magnitude less than the applicable ADEC cleanup criterion of 10.0 mg/L for this analyte. Toluene was not detected greater than the laboratory's LOQ for the analysis of this analyte, and the LOQ was less than the applicable ADEC cleanup criterion.

Water Samples MW9-0701 and MW26-0701 did not exhibit analyte concentrations greater than the respective LOQs for the analyses, which were all below the applicable ADEC cleanup criteria.

Analytical results for the groundwater samples are listed in Table 2; the laboratory data are included in Appendix D; and the monitoring well locations are shown on Figure 2**.**

5.2 Soil Samples

The soil samples were analyzed at SGS by the following methods: GRO by Alaska Method (AK) 101; DRO by AK 102; and BTEX by Environmental Protection Agency (EPA) Method 8021B. Additionally Soil Sample SB7C-5-1202 was analyzed for PAHs by EPA 8270D SIMS.

The soil samples collected from the site were labeled, for example, SB7C-5-1202, where the prefix SB7B indicates the soil boring as related nearest associated monitoring well (both current and historical monitoring wells); -5 indicates the depth interval from which the soil sample was collected within the soil boring; and 1202 indicates the month and day the sample was collected.

Soil Sample SB2B-7-1202 exhibited a concentration of benzene of 0.146 mg/Kg, which exceeded the ADEC cleanup criterion of 0.025 mg/Kg for this analyte. The remaining analytes for this sample were either detected at concentrations less than the applicable ADEC cleanup criteria, or were not detected at concentrations greater than the laboratory's LOQs for the analyses (and these LOQs were below the applicable ADEC cleanup criteria).

Soil sample SB7C-5-1202 exhibited concentrations of GRO at 545 mg/Kg, DRO at 619 mg/Kg, 2-Methylnaphthylene at 7.340 mg/Kg, and benzene at 2.37 mg/Kg; all of which exceeded the applicable ADEC cleanup criteria of 300 mg/Kg, 250 mg/Kg, 6.1 mg/Kg, and 0.025 mg/Kg; respectively for these analytes. The remaining analytes were either detected at concentrations that were less than the applicable ADEC cleanup criteria, or were not detected at concentrations greater than the laboratory's LOQs for the analyses (and these LOQs were below the applicable ADEC cleanup criteria).

Soil Samples SB11B-8-1202, SB11C-3-1202, and SB11C-6-1202 exhibited concentrations of benzene at 0.310 mg/Kg, 0.0926 mg/Kg, and 0.409 mg/Kg respectively; all of which exceeded the ADEC cleanup criterion of 0.025 mg/Kg for this analyte. The remaining analytes within these samples were either detected at concentrations that were less than the applicable ADEC cleanup criteria, or were not detected at concentrations greater than the laboratory's LOQs for the analyses (and the LOQs were below the applicable ADEC cleanup criteria).

All analytes within Soil Samples SB3B-7-1202, SB6B-6-1202, SB9B-7-1202, and SB9B-8-1202 (duplicate of SB9B-7-1202), were either detected at concentrations that were less than the applicable ADEC cleanup criteria, or were not detected at concentrations greater than the laboratory's LOQs for the analyses (and these LOQs were below the applicable ADEC cleanup criteria).

Analytical results for the soil samples are listed in Table 3; the laboratory data are included in Appendix D, and the soil boring locations and results are shown on Figure 3**.**

6.0 HISTORICAL GROUNDWATER LABORATORY DATA

The only monitoring well that has exhibited contaminant concentrations exceeding ADEC cleanup criteria is Monitoring Well MW7. During the current sampling event, Monitoring Well MW7 exhibited concentrations of GRO, benzene, ethylbenzene, and total xylenes that were less than the applicable ADEC cleanup criteria. None of the other analytes for the groundwater samples collected during the July 2015 sampling event were detected at concentrations greater than the LOQs. The historical laboratory data trends of Monitoring Well MW7 are summarized in Table 4 and are shown on graphs in Appendix E.

7.0 LABORATORY DATA QUALITY REVIEW

Data quality was reviewed in accordance with ADEC guidance and standard industry practices. An ADEC laboratory data review checklist was completed for each laboratory work order, and these checklists are included in Appendix F. Sample analyses were provided by SGS of Anchorage, Alaska. All samples were hand-delivered to SGS by BGES personnel under chain of custody protocol.

Work Order 1153337

The temperature of the sample cooler that contained the water samples was measured at the laboratory at the time of receipt to be 3.5 degrees Celsius (°C). The temperature in the cooler was within the prescribed optimal temperature range of 4°C +/- 2 °C.

The samples contained the proper preservatives for the requested analyses. Samples MW7-0701 and MW9-0701 had their labels inadvertently transposed. This was corrected, by K. Shippen, at the laboratory, prior to the performance of analyses; and there was no effect on data quality. Trip blanks accompanied all volatile samples through the entirety of the sampling process and delivery to the laboratory. The case narrative for this work order did not list any quality control (QC) failures that were identified by SGS.

A field duplicate for groundwater was inadvertently not collected at the time of our field activities. As such, field sampling precision could not be evaluated for this sampling effort.

Work Order 1156988

The temperature of the sample cooler that contained the soil samples was measured at the laboratory at the time of receipt to be 4.2 degrees Celsius (°C). The temperature in the cooler was within the prescribed optimal temperature range of 4°C +/- 2 °C.

The samples contained the proper preservatives for the requested analyses and no unusual sample conditions were noted by the laboratory. Trip blanks accompanied all volatile samples through the entirety of the sampling process and delivery to the laboratory. The case narrative for this work order noted that there were quality control (QC) failures identified by SGS.

The recoveries of the surrogate 4-bromofluorobenzene (BFB) in Laboratory Samples SB2B-7-1202, SB7C-5-1202, SB11B-8-1202, SB11C-3-1202, and SB11C-6-1202, related to the analysis of GRO within the samples, exceeded the laboratory's QC acceptance range (reportedly due to "matrix interference"). For this reason, the detectable concentration of GRO within Sample SB7C-5-1202 is qualified "J", and should be considered an estimate. Because of this, the reported concentrations of GRO within these samples are potentially biased high. While it is possible the reported concentration of GRO within Sample SB7C-5-1202 may exceed the applicable ADEC cleanup criterion due to this potential bias, because the sample contains other analytes at concentrations that significantly exceed their respective cleanup criteria, it is our opinion that the data are acceptable for their intended use. Because the remaining samples listed above did not exhibit concentrations of GRO in excess of the ADEC cleanup criterion, it is our opinion that this data QC failure does not affect the acceptability of the data for their intended use.

The recovery of several spiked PAH compounds within the matrix spike (MS) and matrix spike duplicate (MSD) , derived from parent sample SB7C-5-1202 did not meet the laboratory's QC criteria. The recovery of Acenaphthylene was above the laboratory's QC criteria, indicating that the reported concentration of this analyte may be biased high within the parent sample; however because this analyte was not detected above the laboratory's LOQ for this analysis, and the LOQ did not exceed the applicable ADEC cleanup criterion, it is our opinion that this data QC failure does not affect the datum for its intended use. The recoveries of 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene were below the laboratory's QC criteria, indicating that the reported concentrations of these analytes within the parent sample may be biased low. Because the reported concentration of 2-Methylnaphthalene was above the applicable ADEC cleanup criterion for this analyte, it is our opinion

that this data QC error does not affect the usability of the datum for its intended use. Because the reported concentration of Naphthalene within the parent sample was one order of magnitude below the applicable ADEC cleanup criterion, it is our opinion that this data QC error does not affect the usability of the datum for its intended use. Because the reported concentration of 1-Methylnaphthalene within the parent sample was less than one order of magnitude below the applicable ADEC cleanup criterion for this analyte, it is our opinion that this data QC error may affect the usability of the datum for its intended use. No other data QC errors were noted by the laboratory.

8.0 CONCLUSIONS AND RECOMMENDATIONS

As described above, water samples were collected on July 1, 2015. The samples were analyzed to evaluate the current conditions of groundwater on the site. Water Sample MW7 exhibited concentrations of GRO, benzene, ethylbenzene, and total xylenes below the applicable ADEC cleanup criteria. All other analytes in this sample, and all analytes in Monitoring Wells MW9, and MW26, were not detected above the LOQs for the analyses, and all LOQs were below the applicable ADEC cleanup criteria.

The groundwater flow direction could not be measured accurately during the July groundwater monitoring event due to obstructions above monitoring wells MW3 and MW5. Groundwater flow direction as measured historically, was generally northwesterly.

All analyte concentrations in Monitoring Well MW26 have declined to non-detectable levels during the previous eight (including the current sampling round) sampling events. It is therefore recommended that permission be requested from the ADEC to remove Monitoring Well MW26 from the sampling program.

All analyte concentrations in Monitoring Well MW9 have declined to non-detectable levels during the previous five (including the current sampling round) sampling events. It is therefore recommended that permission be requested from the ADEC to remove Monitoring Well MW9 from the sampling program.

All analyte concentrations in Monitoring Well MW7 have declined to levels below the applicable ADEC cleanup criteria for three consecutive monitoring events. Based on these results, it is recommended that a copy of this report be provided to the ADEC for their review and for their opinion regarding the appropriateness of discontinuing groundwater sampling at this time; and for the qualification of this site for a status of “cleanup complete with institutional controls”. If the ADEC agrees that termination of the groundwater monitoring at this site is appropriate, then it is recommended that a work plan for

decommissioning the monitoring wells be prepared and presented to the ADEC for their review and approval. It is also recommended that permission be requested from the ADEC to spread the purge water on site from the October of 2014, the March of 2015, and the July of 2015 sampling events, or dispose of it via the sanitary sewer upon receiving permission from Anchorage Water and Wastewater Utility (AWWU).

In addition to the groundwater monitoring event, which was conducted in July 2015, eight soil borings were advanced to 25 feet below grade on December 2, 2015. Screening samples collected from five of the soil borings exhibited PID readings greater than 500 ppm. Nine soil samples, including one duplicate, were submitted for laboratory analysis; four of which exhibited concentrations of analytes that exceeded ADEC cleanup criteria (as described in Section 5.2 above). The greatest concentrations of contaminants were identified in a sample collected from Soil Boring SB7C, which was advanced adjacent to Monitoring Well MW7. While soil contamination remains at the subject property in concentrations that exceed applicable ADEC cleanup criteria, it would appear that these contaminated soils are not causing groundwater in these areas to contain concentrations of contaminants in excess of ADEC groundwater cleanup criteria.

If the ADEC does not elect to require continued groundwater monitoring for this site, it is recommended that all monitoring wells on the property be decommissioned in accordance with applicable regulations. If the ADEC requires further groundwater monitoring for this site, it is recommended that all monitoring wells be assessed for damage, properly repaired, and re-surveyed to obtain accurate elevation data prior to additional groundwater monitoring activities.

9.0 EXCLUSIONS AND CONSIDERATIONS

This report presents facts, observations, and inferences based on conditions observed during the period of our project activities, and only those conditions that were evaluated as part of our scope of work. Our conclusions are based solely on our observations made in the local vicinities of the monitoring wells, and soil borings, which provide an indication of the environmental condition of the groundwater, and soils in the general vicinity of these wells and soil borings at the site. In addition, changes to site conditions may have occurred since we completed our project activities. These changes may be from the actions of man or nature. Changes in regulations may also impact the interpretation of site conditions. BGES will not disclose our findings to any parties other than our client as listed above, except as directed by our client, or as required by law.

The field work was conducted, and this report prepared by Kris Shippen, Environmental Scientist of BGES. Mr. Shippen is a Qualified Person (QP) as defined by the ADEC, and has conducted numerous site characterization in Anchorage and throughout Alaska. This report was This report was reviewed by Brian Braunstein, Senior Environmental Specialist of BGES; and was approved by Robert N. Braunstein, a Certified Professional Geologist (CPG) and Principal of BGES. Brian Braunstein has over 10 years of environmental consulting experience and has conducted and managed hundreds of similar site assessment and remediation projects throughout Alaska. Robert N. Braunstein has more than 35 years of professional environmental and geological consulting experience, and has conducted and managed thousands of environmental projects involving site characterization and remediation efforts throughout Alaska and the lower 48 states.

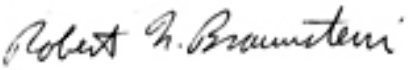
Prepared By:

Kris Shippen
Environmental Scientist I

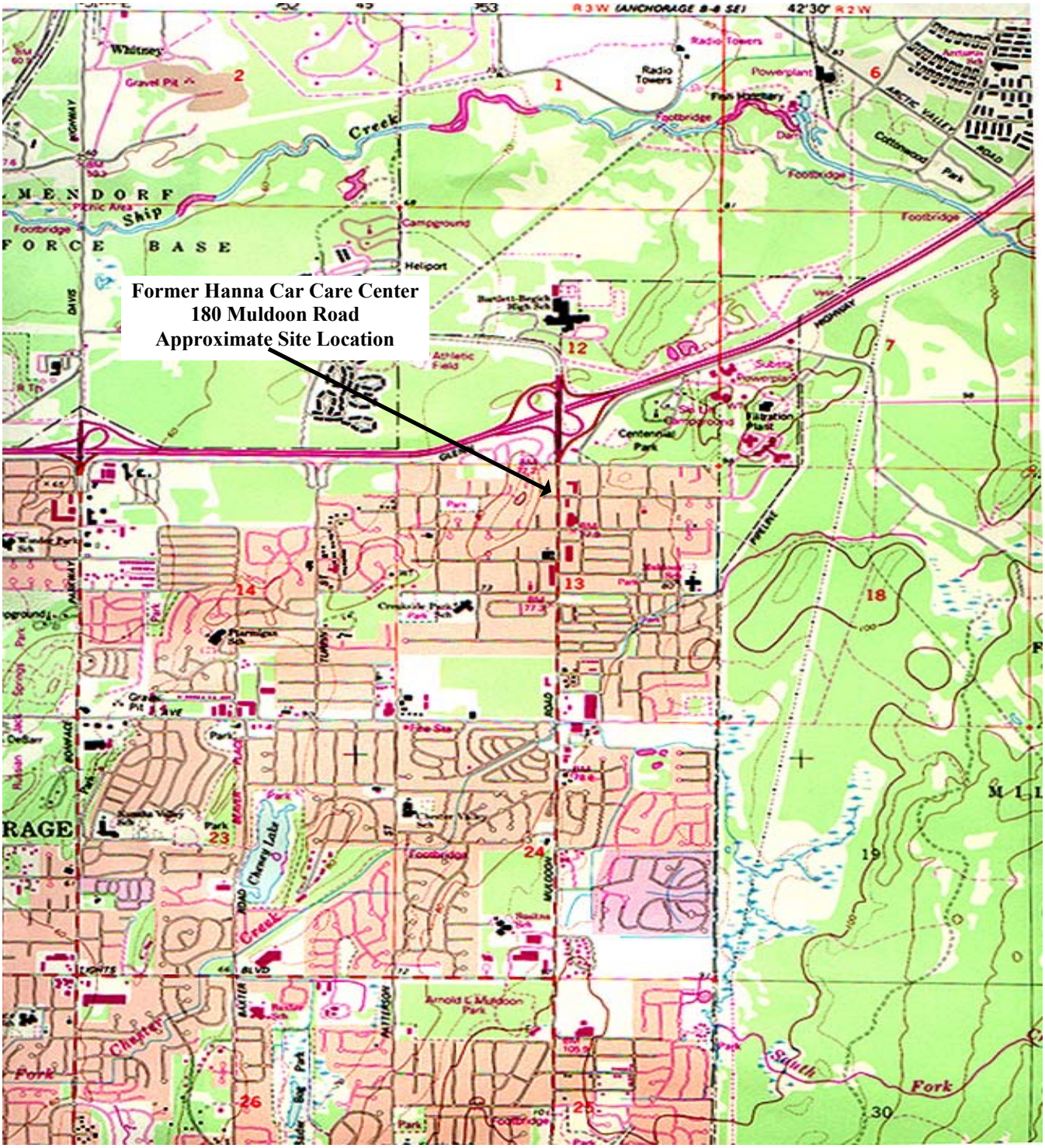
Reviewed By:

Brian Braunstein
Senior Environmental Specialist

Approved By:



Robert N. Braunstein, C.P.G.
Principal



Source: USGS Map, Anchorage (A-8) NE, Alaska 1972, Revised 1993.

N

0 ¼ ½ ¾ 1

Approximate Scale in Miles

Hanna Car Care Center – 180 Muldoon Rd.

Anchorage, Alaska

Property Vicinity Map

BGES, INC	**February 2016**	**Figure 1**

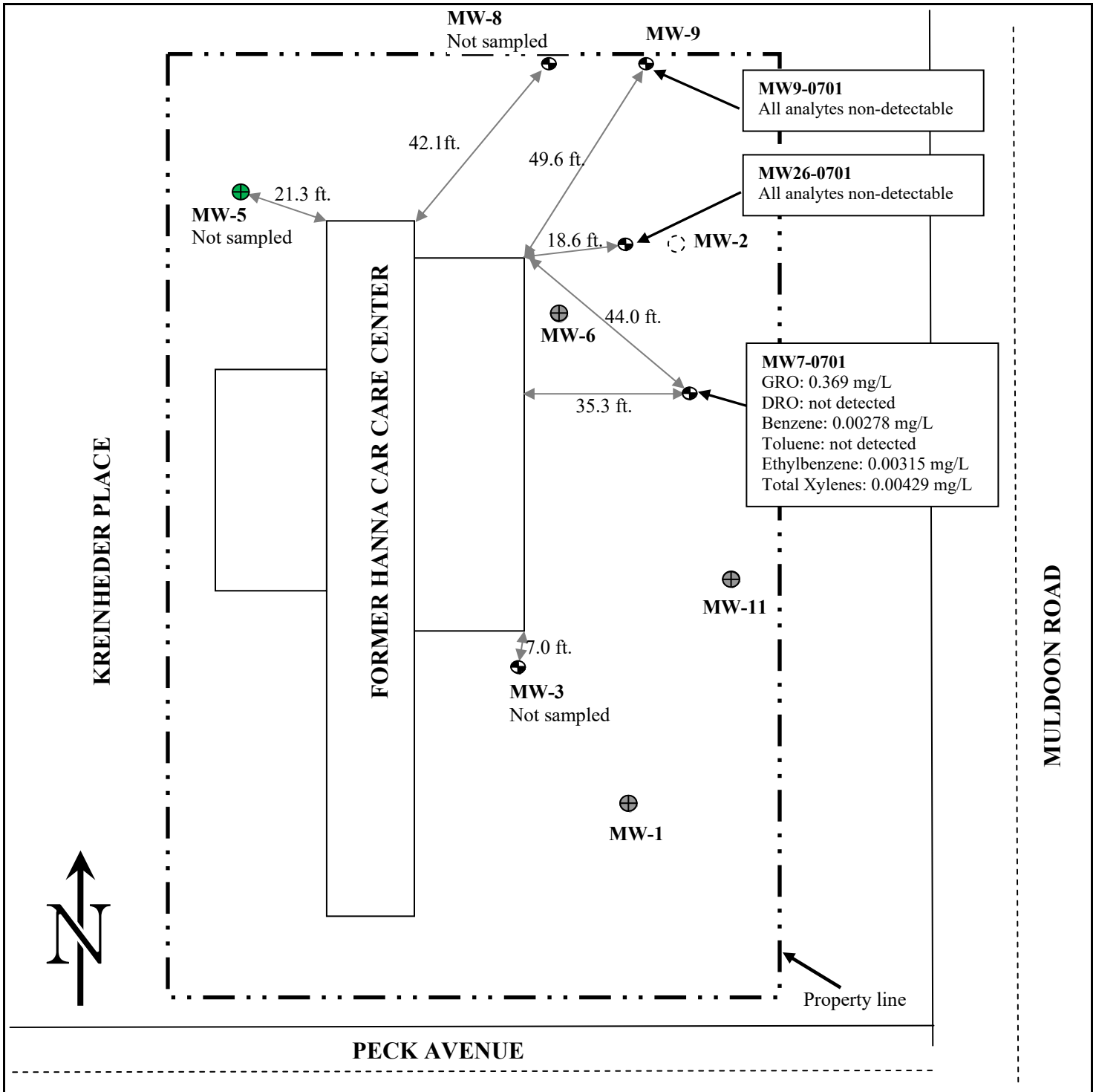


Figure adapted from Restoration Science and Engineering "2003 Soil and Groundwater Site Characterization" March 2003

Former Hanna Car Care Center
180 Muldoon Road

Monitoring Well Locations and Sample Results (July 2015)

BGES, INC.

February 2016

Figure 2

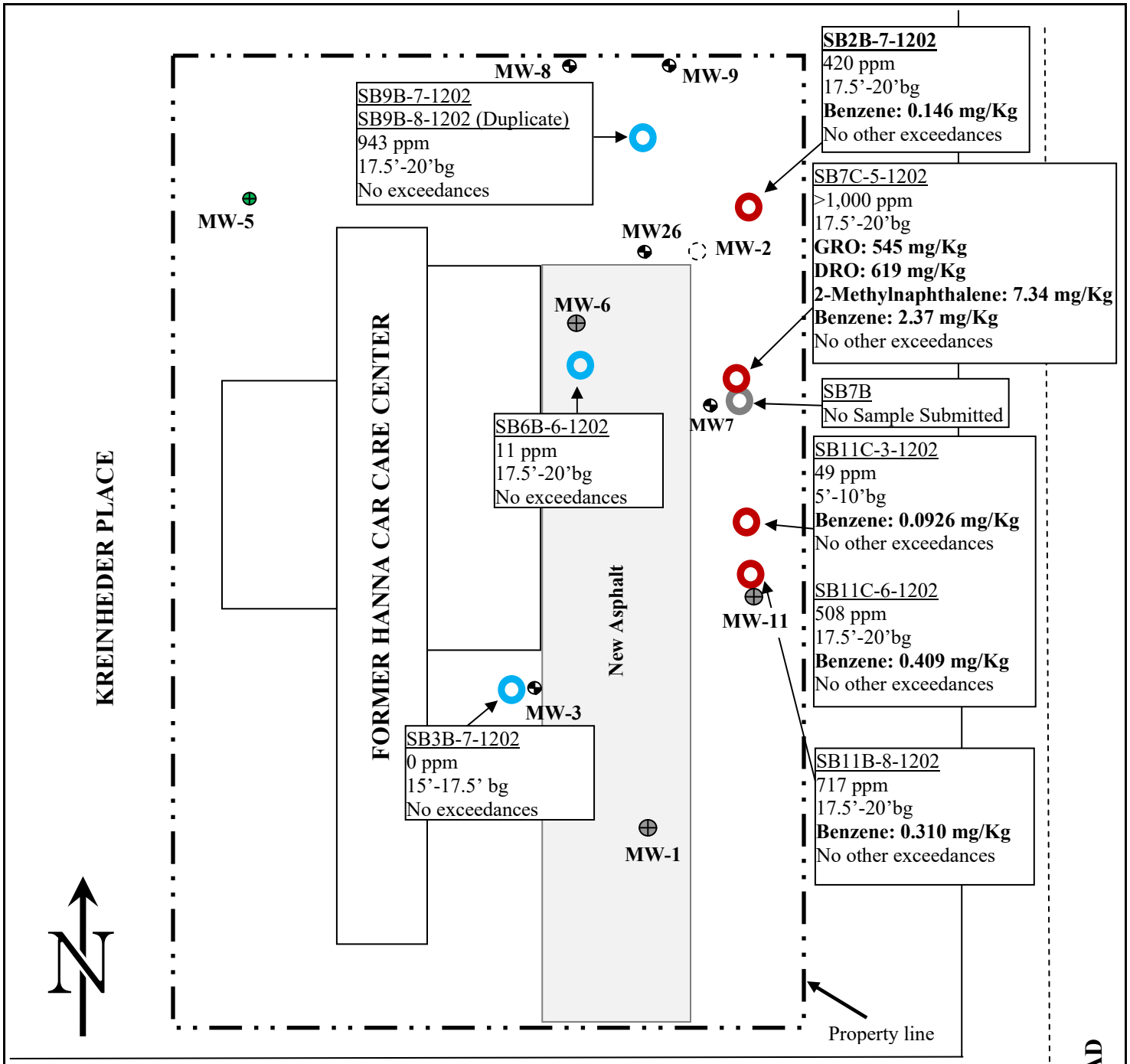


Figure adapted from Restoration Science and Engineering "2003 Soil and Groundwater Site Characterization" March 2003

- Monitoring well (Accessible)
- Monitoring well (decommissioned by BGES; June 2004)
- Approximate location of monitoring well (never located)
- Monitoring well (could not be accessed due to obstruction)
- Soil Boring Locations, (no ADEC cleanup criteria exceedances)
- Soil Boring Location (ADEC cleanup criteria exceedances)
- Soil Boring Location (no sample submitted)

0 15 30 60

Approximate Scale in Feet

Notes: ppm = parts per million; bg = below grade; mg/Kg = milligrams per Kilogram;

Former Hanna Car Care Center
180 Muldoon Road
Soil Boring Locations and Sample Results (December 2015)

BGES, INC. | **February 2016** | **Figure 3**

TABLE 1 **BGES, INC.**

FORMER HANNA CAR CARE CENTER
180 MULDOON ROAD
ANCHORAGE, ALASKA
MONITORING WELL SAMPLING DATA (July 2015)

Well Number	MW3	MW5	MW7	MW8	MW9	MW26
Date Sampled	N/A	N/A	07/01/15	N/A	07/01/15	07/01/15
Date of Depth and Elevation Measurement	N/A	N/A	07/01/15	07/01/15	07/01/15	07/01/15
Time of Depth to Water Measurement	N/A	N/A	10:37	10:28	10:32	10:40
Time Sample Collected	N/A	N/A	16:35	N/A	11:38	14:26
Top of Casing Elevation (feet)	N/A	N/A	250.66	251.03	N/A	250.92
Depth to Water (feet below top of casing)	N/A	N/A	13.37	13.39	13.84	13.61
Water Elevation (feet)	N/A	N/A	237.29	237.64	N/A	237.31
Total Depth of Well (feet below top of casing)	N/A	N/A	19.24	24.09	23.57	22.55
Well Casing Diameter (Inches)	N/A	N/A	2	2	2	2
Standing Water Well Volume (gallons)	N/A	N/A	0.96	1.75	1.59	1.46
Purge Volume-Actual (gallons)	N/A	N/A	3.0	N/A	4.75	4.5
Temperature (degrees Celsius)	N/A	N/A	11.7//10.5//10.7	N/A	10.8//10.0//10.0	10.5//10.5//10.9
pH (standard units)	N/A	N/A	6.74//6.77//6.71	N/A	6.66//6.68//6.25	6.91//7.04//6.77
Conductivity (millisiemans per centimeter)	N/A	N/A	228.9//214.0//214.9	N/A	277.7//265.5//267	255.1//264.2//262.5
Dissolved Oxygen	N/A	N/A	N/A	N/A	N/A	N/A
Oxidation Reduction Potential (ORP)	N/A	N/A	46.4//35.7//33.7	N/A	42.1//3.8//13.5	26.0//27.2//33.9
Notes: Values separated by // indicate readings for successive well volumes removed Sampler: K. Shippen Field parameters measured with a YSI Pro Plus N/A = Not Available Weather conditions on July 1, 2015 were partly cloudy and 64° F.	Well Could not be accessed because a vehicle was parked directly over the well. The owner could not be located.	Well could not be accessed because it is currently located under the corner of a temporary storage structure.		Monitoring Well MW8 was not sampled as part of this effort.		

TABLE 2 **BGES, INC.**

FORMER HANNA CAR CARE CENTER
180 MULDOON ROAD
ANCHORAGE, ALASKA
GROUNDWATER MONITORING ANALYTICAL RESULTS (July 2015)

Sample No.	Parameter	Results (mg/L)	LOQ (mg/L)	ADEC Cleanup Criteria (mg/L)[1]	Analytical Method
MW7-0701	Gasoline Range Organics	0.369	0.100	2.2	AK101
	Diesel Range Organics	ND	0.600	1.5	AK102
	Benzene	0.00278	0.000500	0.005	SW 8021B
	Toluene	ND	0.00100	1.0	SW 8021B
	Ethylbenzene	0.00315	0.00100	0.7	SW 8021B
	Xylenes (Total)	0.00429	0.00300	10	SW 8021B
MW9-0701	Gasoline Range Organics	ND	0.100	2.2	AK101
	Diesel Range Organics	ND	0.600	1.5	AK102
	Benzene	ND	0.000500	0.005	SW 8021B
	Toluene	ND	0.00100	1.0	SW 8021B
	Ethylbenzene	ND	0.00100	0.7	SW 8021B
	Xylenes (Total)	ND	0.00300	10	SW 8021B
MW26-0701	Gasoline Range Organics	ND	0.100	2.2	AK101
	Diesel Range Organics	ND	0.600	1.5	AK102
	Benzene	ND	0.000500	0.00500	SW 8021B
	Toluene	ND	0.00100	1.0	SW 8021B
	Ethylbenzene	ND	0.00100	0.7	SW 8021B
	Xylenes (Total)	ND	0.00300	10	SW 8021B

[1] Groundwater cleanup criteria obtained from ADEC 18 Alaska Administrative Code 75.345, Table C (June 17, 2015).
ADEC = Alaska Department of Environmental Conservation; mg/L = milligrams per liter
LOQ = limit of quantitation; ND = not detectable

TABLE 3
180 Muldoon Road
ANCHORAGE, ALASKA
ANALYTICAL RESULTS - SOIL SAMPLES

Sample No.	Parameter	Results (mg/Kg)	LOQ (mg/Kg)	ADEC Cleanup Criteria (mg/Kg)[1]	Analytical Method
SB2B-7-1202	GRO	43.1	2.03	300	AK 101
PID = 420 ppm	DRO	ND	21.9	250	AK 102
Depth = 17.5 to 20 feet	**Benzene**	**0.146**	0.0101	0.025	SW 8021B
	Toluene	0.191	0.0203	6.5	SW 8021B
	Ethylbenzene	0.0731	0.0203	6.9	SW 8021B
	Total Xylenes	0.2656	0.0609	63	SW 8021B
SB3B-7-1202	GRO	1.89	1.64	300	AK 101
PID = 0 ppm	DRO	ND	22.1	250	AK 102
Depth = 15 to 17.5 feet	Benzene	ND	0.00822	0.025	SW 8021B
	Toluene	0.0349	0.0164	6.5	SW 8021B
	Ethylbenzene	ND	0.0164	6.9	SW 8021B
	Total Xylenes	0.0543	0.0493	63	SW 8021B
SB6B-6-1202	GRO	2.15	1.97	300	AK 101
PID = 11 ppm	DRO	ND	22.4	250	AK 102
Depth = 17.5 to 20 feet	Benzene	ND	0.00985	0.025	SW 8021B
	Toluene	0.0400	0.0197	6.5	SW 8021B
	Ethylbenzene	ND	0.0197	6.9	SW 8021B
	Total Xylenes	0.0811	0.0591	63	SW 8021B
SB7C-5-1202	**GRO**	**545 J**	176	300	AK 101
PID = >1,000 ppm	**DRO**	**619**	22.0	250	AK 102
Depth = 17.5 to 20 feet	1-Methylnaphthalene	4.860	0.543	6.2	8270D SIMS
	2-Methylnaphthalene	**7.340**	0.543	6.1	8270D SIMS
	Acenaphthene	0.0365	0.00543	180	8270D SIMS
	Fluoranthene	0.00994	0.00543	1400	8270D SIMS
	Fluorene	0.0303	0.00543	220	8270D SIMS
	Naphthalene	2.150	0.543	20	8270D SIMS
	Phenanthrene	0.0377	0.00543	3000	8270D SIMS
	Pyrene	0.0152	0.00543	1000	8270D SIMS
	All other PAHs	ND	Varies	Varies	8270D SIMS
	Benzene	**2.37**	*0.0880*	0.025	SW 8021B
	Toluene	1.590	0.176	6.5	SW 8021B
	Ethylbenzene	3.670	0.176	6.9	SW 8021B
	Total Xylenes	7.670	0.528	63	SW 8021B
SB9B-7-1202	GRO	ND	1.77	300	AK 101
PID = 943 ppm	DRO	ND	21.9	250	AK 102
Depth = 17.5 to 20 feet	Benzene	ND	0.00885	0.025	SW 8021B
	Toluene	0.0517	0.0177	6.5	SW 8021B
	Ethylbenzene	0.0179	0.0177	6.9	SW 8021B
	Total Xylenes	0.0814	0.0531	63	SW 8021B
SB9B-8-1202					
Duplicate of SB9B-7-1202					
	GRO	ND	1.74	300	AK 101
	DRO	ND	22.0	250	AK 102
	Benzene	0.0123	0.00868	0.025	SW 8021B
RPD = 6%	Toluene	0.0547	0.0174	6.5	SW 8021B
RPD = 11%	Ethylbenzene	0.0200	0.0174	6.9	SW 8021B
RPD = 24%	Total Xylenes	0.104	0.0521	63	SW 8021B
SB11B-8-1202	GRO	99.1	19.0	300	AK 101
PID = 717 ppm	DRO	ND	22.6	250	AK 102
Depth = 17.5 to 20 feet	***Benzene***	***0.310***	*0.0949*	0.025	SW 8021B
	Toluene	0.319	0.190	6.5	SW 8021B
	Ethylbenzene	0.174	0.0190	6.9	SW 8021B
	Total Xylenes	0.151	0.0570	63	SW 8021B

TABLE 3
180 Muldoon Road
ANCHORAGE, ALASKA
ANALYTICAL RESULTS - SOIL SAMPLES

Sample No.	Parameter	Results (mg/Kg)	LOQ (mg/Kg)	ADEC Cleanup Criteria (mg/Kg)[1]	Analytical Method
SB11C-3-1202	GRO	61.3	3.81	300	AK 101
PID = 49 ppm	DRO	ND	84.3	250	AK 102
Depth = 5 to 10 feet	**Benzene**	**0.0926**	0.0191	0.025	SW 8021B
	Toluene	1.440	0.0381	6.5	SW 8021B
	Ethylbenzene	0.689	0.0381	6.9	SW 8021B
	Total Xylenes	14.810	0.1143	63	SW 8021B
SB11C-6-1202	GRO	195	18.7	300	AK 101
PID = 508 ppm	DRO	ND	22.7	250	AK 102
Depth = 17.5 to 20 feet	**Benzene**	**0.409**	0.00936	0.025	SW 8021B
	Toluene	0.237	0.0187	6.5	SW 8021B
	Ethylbenzene	0.119	0.0187	6.9	SW 8021B
	Total Xylenes	0.1328	0.0561	63	SW 8021B

[1] Soil sample results are compared to the ADEC Method 2 Cleanup Criteria listed in 18 Alaska Administrative Code (AAC) 75.341 – Tables B1 and B2 (migration to groundwater) for soils, as revised on June 17, 2015. The cleanup criteria were obtained from Table B1 from the migration to groundwater values for soils, except for GRO, DRO and RRO which are listed in Table B2 in the "under 40-inch zone" (referring to annual precipitation), where GRO and DRO are compared to the migration to groundwater values and where RRO is based on the more conservative cleanup criterion protective of the ingestion pathway.

ADEC = Alaska Department of Environmental Conservation; PID = photoionization detector
ppm = parts per million; mg/Kg = milligrams per kilogram; RPD = relative percent difference
DRO = diesel range organics; GRO = gasoline range organics; PAHs = Polynuclear Aromatic Hydrocarbons
LOQ = Limit of Quantitation; ND = not detectable

Bold = The concentration exceeds the applicable ADEC cleanup criterion.
Italics = The LOQ exceeds the applicable ADEC cleanup criterion.

TABLE 4
FORMER HANNA CAR CARE CENTER
180 MULDOON ROAD, ANCHORAGE, ALASKA
HISTORICAL GROUNDWATER MONITORING DATA

Sample Name	Parameter	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Analytical Method	ADEC Groundwater Cleanup Level (mg/L)[1]
	Date Collected	**4/13/2004**	**9/20/2004**	**6/20/2005**	**1/4/2006[2]**	**6/13/2006**	**12/6/2006[3]**	**10/17/2007**	**5/14/2008**	**7/1/2009**	**6/10/2010**	**10/31/2014**	**3/23/2015**	**7/1/2015**		
MW-6	GRO	0.119	0.166	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	AK101	2.2
	DRO	NA	<0.306	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	AK102	1.5
	Benzene	<0.000500	<0.000500	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	SW8021B	0.005
	Toluene	<0.00200	<0.00200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	SW8021B	1.0
	Ethylbenzene	<0.00200	<0.00200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	SW8021B	0.7
	Total Xylenes	<0.00200	<0.00200	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	SW8021B	10.0
MW-26	GRO	0.770	NA	<0.090	<0.090	<0.100	<0.100	<0.0500	<0.0500	<0.0500	<0.0500	<0.100	<0.100	<0.100	AK101	2.2
	DRO	NA	NA	<0.303	<0.300	<0.345	<0.312	<0.397	<0.400	NA	NA	<0.600	<0.600	<0.600	AK102	1.5
	RRO	NA	NA	<0.505	<0.500	<0.575	<0.519	<0.397	<0.400	NA	NA	NA	NA	NA	AK103	1.1
	Benzene	0.00433	NA	<0.0005	<0.0005	0.00167	<0.000500	<0.000500	<0.000500	<0.000500	<0.00500	<0.000500	<0.000500	<0.000500	SW8021B	0.005
	Toluene	<0.00200	NA	<0.00200	<0.00200	<0.002	<0.002	<0.000500	<0.000500	<0.00100	<0.00500	<0.00100	<0.00100	<0.00100	SW8021B	1.0
	Ethylbenzene	<0.00200	NA	<0.00200	<0.00200	<0.002	<0.002	<0.000500	<0.000500	<0.00100	<0.00500	<0.00100	<0.00100	<0.00100	SW8021B	0.7
	Total Xylenes	0.00515	NA	<0.00200	<0.00200	0.00380	<0.002	<0.00150	<0.00150	<0.00300	<0.00280	<0.00300	<0.00300	<0.00300	SW8021B	10.0
MW-7	GRO	**6.440**	**7.630**	**2.690**	**3.56J**	**3.340**	**2.20J**	2.06 J	**2.690**	**2.26 J**	**4.190**	0.135	0.307	0.369	AK101	2.2
	DRO	**4.18**	**2.49**	0.952	0.725J	1.38	1.07	0.868	0.807	0.804 J	1.42	<0.694	<0.694	<0.600	AK102	1.5
	RRO	NA	NA	<0.510	<0.549	<0.556	<0.517	<0.391	<0.397	NA	NA	NA	NA	NA	AK103	1.1
	Benzene	**0.0158**	**0.0342**	**0.00711**	**0.0151J**	**0.0118**	**0.0222J**	**0.0131**	0.00100	0.00099 J	**0.00821**	0.00104	0.00186	0.00278	SW8021B	0.005
	Toluene	<0.0200	0.0140	0.00403	0.00447J	0.00225	0.00940J	0.00162	0.00376	0.00108 J	0.00498	<0.00100	<0.00100	<0.00100	SW8021B	1.0
	Ethylbenzene	0.234	0.292	0.082	0.092J	0.1020	0.144J	0.0568	0.0944	0.0345 J	0.110	0.00151	0.00282	0.00315	SW8021B	0.7
	Total Xylenes	0.547	0.600	0.158	0.15547J	0.18087	0.23627J	0.0864	0.1770	0.0529 J	0.169	<0.00300	0.00503 J	0.00429	SW8021B	10.0
MW-8	GRO	<0.0900	0.319	0.113	0.102J	<0.100	<0.100	<0.0500	<0.0500	NA	NA	NA	NA	NA	AK101	2.2
	DRO	NA	<0.313	<0.306	<0.323J	<0.319	<0.309	<0.391	<0.397	NA	NA	NA	NA	NA	AK102	1.5
	RRO	NA	NA	<0.510	<0.538	<0.532	<0.515	<0.391	<0.397	NA	NA	NA	NA	NA	AK103	1.1
	Benzene	0.000653	0.00234	0.000606	0.000994	0.00122	<0.000500	<0.000500	<0.000500	NA	NA	NA	NA	NA	SW8021B	0.005
	Toluene	<0.00200	<0.00200	<0.00200	<0.00200J	<0.002	<0.002	<0.000500	<0.000500	NA	NA	NA	NA	NA	SW8021B	1.0
	Ethylbenzene	<0.00200	<0.00200	<0.00200	<0.00200	<0.002	<0.002	<0.000500	<0.000500	NA	NA	NA	NA	NA	SW8021B	0.7
	Total Xylenes	<0.00200	<0.00200	<0.00200	<0.00200J	<0.002	<0.002	<0.00150	<0.00150	NA	NA	NA	NA	NA	SW8021B	10.0
MW-9	GRO	<0.0900	0.711	<0.090	<0.090	0.111	<0.100	0.0656	0.0594	NA	NA	NA	NA	<0.100	AK101	2.2
	DRO	NA	0.404	<0.303	<0.300	<0.323	<0.311	<0.391	<0.403	NA	NA	NA	NA	<0.600	AK102	1.5
	RRO	NA	NA	<0.505	<0.500	<0.538	<0.518	<0.391	<0.403	NA	NA	NA	NA	NA	AK103	1.1
	Benzene	<0.000500	0.00356	0.000593	<0.0005	0.001080	<0.000500	<0.000500	<0.000500	NA	NA	NA	NA	<0.000500	SW8021B	0.005
	Toluene	<0.00200	<0.00200	<0.00200	<0.00200	<0.002	<0.002	<0.000500	<0.000500	NA	NA	NA	NA	<0.00100	SW8021B	1.0
	Ethylbenzene	<0.00200	<0.00200	<0.00200	<0.00200	<0.002	<0.002	<0.000500	<0.000500	NA	NA	NA	NA	<0.00100	SW8021B	0.7
	Total Xylenes	<0.00200	<0.00200	<0.00200	<0.00200	0.00221	<0.002	<0.00150	<0.00150	NA	NA	NA	NA	<0.00300	SW8021B	10.0

[1] = Groundwater cleanup criteria based on 18 Alaska Administrative Code 75.345, Table C (June 17, 2015).

[2] = Sample MW-26 was collected on 1/05/06 and samples MW-7 and MW-8 were collected on 1/10/06

[3] = Sample MW-7 was collected on 12/7/06

mg/L = milligrams per liter; GRO = Gasoline Range Organics; DRO = Diesel Range Organics; RRO = Residual Range Organics; NA = Not Analyzed

J = data are considered to be estimates.

Bold = Exceeds Applicable ADEC Cleanup Criterion

APPENDIX A
SITE PHOTOGRAPHS

Photo 1. MW7 (looking West)

Photo 2. MW9 (looking South)

Photo 3. MW26 (looking West)

Photo 4. Soil Boring SB6B (looking Northwest)

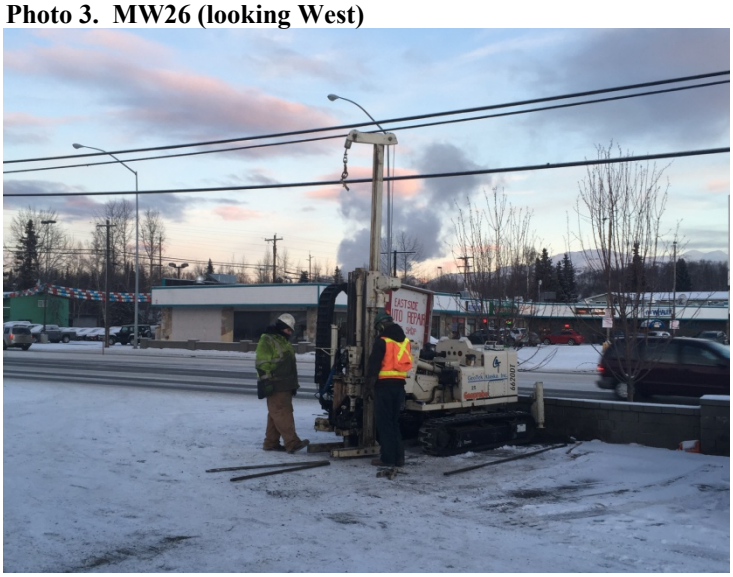


Photo 5. Soil Boring SB7C (Looking Northeast)

Photo 6. Soil Sample Collection Activities (looking South)

Hanna Car Care (Former)
180 Muldoon Road
Anchorage, Alaska
Site Photographs

BGES. INC.	**February 2016**	**Appendix A**

APPENDIX B
FIELD NOTES

3/23/15 28° Clear

09:25 BGES arrives on Site
1- Check GW levels in all wells
2- Sample MW 26
3- Sample MW 7 and collect Duplicate
4- Submit Samples for DRO, GRO, BTEX

MW #	DTW	TDW	Time of measurement	Notes
3	13.29	17.55	09:56	Well plug very rusted
7	12.98	19.43	11:17	Ice and Dirt under CI cap
8	13.46	24.10	10:58	
9	13.45	23.57	10:54	Ice under CI cap
26	13.26	22.70	10:15	Ice under CI cap
5	Not accessable (under corner of Temporary Structure			

12:00 Begin Purging MW 26
13:15 Collect Sample MW26-0323
14:19 Begin Purging MW 7
15:16 Collect Samples MW7-0323 and MW27-0323
16:49 Leave Site

7-1-15 64° Partly Cloudy

09:45 BGES on Site, Parking Lot Partially paved on 6-30-15. MO Monitoring wells were Covered.

- investigate & uncover MW's

	DTW	TDW	time
~~MW 7~~	~~13.94~~	~~19.42~~	~~10:32~~
~~MW 8~~	~~13.39~~	~~24.09~~	~~10:28~~
~~MW 9~~	~~13.38~~	~~24.10~~	~~10:34~~
~~MW 26~~	~~13.19~~	~~22.71~~	~~10:40~~

5

	DTW	TDW	Time
MW 7	13.37	19.24	10:37
MW 8	13.39	24.09	10:28
MW 9	13.84	23.57	10:32
MW 26	13.61	22.55	10:40

MW 5 and MW 3 Not accessible

12/2/15 Cloudy, 24°F

910 Pollock/Shippen (BGES) and GeoTek on site.

930 Setting up to drill SB6B approx. 7 feet south-southeast of MW6.

11:00 Begin drilling SB3B ≈ 3' west of MW3

12:00 Begin drilling SB11B in approx Location of Lost MW11 Strong odors detected @ 15' bg and to 20' bg

13:18 Begin drilling SB11C N of SB11B Strong odors detected @ 15' to 20' bg

14:30 Begin drilling SB7B E of MW7, Poor recovery bt 5' & 20' bg

15:10 begin drilling SB7C N of SB7B due to poor recovery in SB7B

Soil boring Locations

SB	NE corner	Middle Corner
SB3B	3.5 (from MW3)	7.5'
6B	23.7	63.0
9B	35.7	107.7
11B	81.0	43.6'
11C	70.2	50.8
2B	44.2	95.2
~~2C~~	—	—
7B	50.7	70.7
7C	49.0	72.7

1600 Begin drilling SB2B E of former MW2

1700 Begin drilling SB9B South Southwest of MW9 — Soil boring was placed in this Location due to Utility Conflicts Strong odors @ 17.5' - 20' bg

17:50 borings SB6B and SB3B were backfilled with bentonite and capped with asphalt the remainder

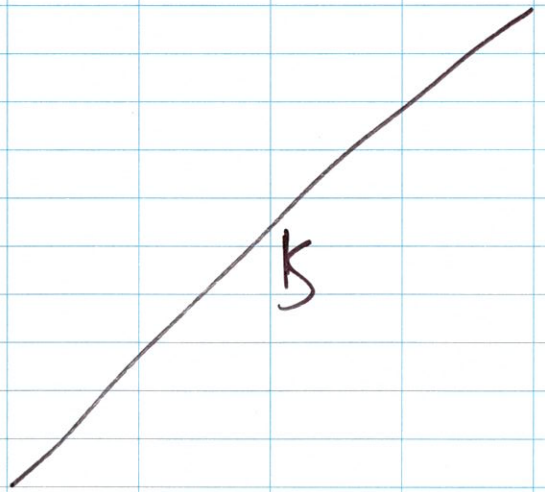
Rite in the Rain

12/2/15 Cont

– Cont from page 9. – were backfilled with bentonite and Capped with Gravel.

Drum w/ Cuttings was Labeled with Client information and placed @ the NW Corner of the building

18:25 BGES off site for day



APPENDIX C

GROUNDWATER MONITORING AND SOIL BORING LOGS

BGES, INC. MW7
ENVIRONMENTAL CONSULTANTS

GROUNDWATER MONITORING LOG

BGES, INC.

Well Number: ~~MW-9~~ 5
Date of Sampling Event: 7-01-15

Weather Conditions: 64°, P Cloudy
Time of Depth to Water Measurement: 1037
Date of Depth to Water Measurement: 07/01/15

Total Depth of Well (feet below TOC): 19.24'
Depth to Water (feet below TOC): 13.37'
Water Column (feet): 5.87'

Type of Sampling Equipment: NP50, 2" bladder pump, Bonded poly tubing, YSI PRO Plus

Volume of well (gals): 0.9 gal

=0.1632 X Water Column (For 2-inch well)
=0.6528 X Water Column (For 4-inch well)
=1.4688 X Water Column (For 6-inch well)

Time Purging Began: 15:05
Time of Sampling: 16:35
Volume purged: 3gal **PURGE A MINIMUM OF THREE WELL VOLUMES**

Temperature (°C)	11.7	Temperature (°C)		**Depth of Bladder intake:** 13.87'
Conductivity	228.9	Conductivity		
pH	6.74	pH		
ORP	46.4	ORP		
Volume Purged	1gal	Volume Purged		
Depth To Water	13.36	Depth To Water		
Time of Measurement	15:36	Time of Measurement		
Temperature (°C)	10.5	Temperature (°C)		**Purge Rate:** 150 mL/min
Conductivity	214.0	Conductivity		
pH	6.77	pH		
ORP	35.7	ORP		
Volume Purged	2gal	Volume Purged		
Depth To Water	13.39	Depth To Water		
Time of Measurement	1603	Time of Measurement		
Temperature (°C)	~~10~~ 10.7	Temperature (°C)		**Sample Rate:** 150 mL/min
Conductivity	214.9	Conductivity		
pH	6.71	pH		
ORP	33.7	ORP		**Sample ID:** ~~MW9-0701~~
Volume Purged	3gal	Volume Purged		
Depth To Water	13.39	Depth To Water		MW7-0701 5
Time of Measurement	16:26	Time of Measurement		
Temperature (°C)		Temperature (°C)		
Conductivity		Conductivity		
pH		pH		
ORP		ORP		
Volume Purged		Volume Purged		
Depth To Water		Depth To Water		
Time of Measurement		Time of Measurement		

Additional Notes:

BGES, INC.

GROUNDWATER MONITORING LOG

BGES, INC.

Well Number: MW9
Date of Sampling Event: 7-1-15

Weather Conditions: 64° P Cloudy
Time of Depth to Water Measurement: 10:32
Date of Depth to Water Measurement: 7-1-15

Total Depth of Well (feet below TOC): 23.57
Depth to Water (feet below TOC): 13.84
Water Column (feet): 9.73

Type of Sampling Equipment: MP50 Controller, 1.75" bladder pump
Poly tubing & bladder

Volume of well (gals): 1.6

=0.1632 X Water Column (For 2-inch well)
=0.6528 X Water Column (For 4-inch well)
=1.4688 X Water Column (For 6-inch well)

Time Purging Began: ~~15:05~~ 11:04
Time of Sampling: ~~16:35~~ 11:38
Volume purged: 4.75 **PURGE A MINIMUM OF THREE WELL VOLUMES**

Temperature (°C)	10.8°	Temperature (°C)	
Conductivity	277.7	Conductivity	
pH	6.66	pH	
ORP	42.1	ORP	
Volume Purged	1.5	Volume Purged	
Depth To Water	13.84	Depth To Water	
Time of Measurement	11:20	Time of Measurement	
Temperature (°C)	10.0	Temperature (°C)	
Conductivity	265.5	Conductivity	
pH	6.68	pH	
ORP	7.8	ORP	
Volume Purged	2.8	Volume Purged	
Depth To Water	13.85	Depth To Water	
Time of Measurement	11:28	Time of Measurement	
Temperature (°C)	10.0	Temperature (°C)	
Conductivity	267	Conductivity	
pH	6.25	pH	
ORP	13.5	ORP	
Volume Purged	4.75	Volume Purged	
Depth To Water	13.80	Depth To Water	
Time of Measurement	11:35	Time of Measurement	
Temperature (°C)		Temperature (°C)	
Conductivity		Conductivity	
pH		pH	
ORP		ORP	
Volume Purged		Volume Purged	
Depth To Water		Depth To Water	
Time of Measurement		Time of Measurement	

Depth of Bladder intake: 14.34

Purge Rate: 150 ml/min

Sample Rate: Same

Sample ID: MW9-0701

Additional Notes:

BGES, INC.
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GROUNDWATER MONITORING LOG

BGES, INC.

Well Number: MW 26
Date of Sampling Event: 7-1-15

Weather Conditions: 64° P Cloudy
Time of Depth to Water Measurement: 10:40
Date of Depth to Water Measurement: 7-1-15

Total Depth of Well (feet below TOC): 22.55'
Depth to Water (feet below TOC): 13.61'
Water Column (feet): 8.54'

Type of Sampling Equipment: MP50 Controller, 2" bladder pump, Bonded poly tubing, YSI Pro Plus

Volume of well (gals): 1.4 gal

=0.1632 X Water Column (For 2-inch well)
=0.6528 X Water Column (For 4-inch well)
=1.4688 X Water Column (For 6-inch well)

Time Purging Began: 12:22
Time of Sampling: 14:26
Volume purged: 4.5 gal **PURGE A MINIMUM OF THREE WELL VOLUMES**

Temperature (°C)	10.5	Temperature (°C)	
Conductivity	255.1	Conductivity	
pH	6.91	pH	
ORP	26.0	ORP	
Volume Purged	1.5 gal	Volume Purged	
Depth To Water	13.67	Depth To Water	
Time of Measurement	13:07	Time of Measurement	

Depth of Bladder intake: 14.11'

Temperature (°C)	10.5	Temperature (°C)	
Conductivity	264.2	Conductivity	
pH	7.04	pH	
ORP	27.2	ORP	
Volume Purged	3 gal	Volume Purged	
Depth To Water	13.62	Depth To Water	
Time of Measurement	13:42	Time of Measurement	

Purge Rate: 150 mL/min

Temperature (°C)	10.9	Temperature (°C)	
Conductivity	262.5	Conductivity	
pH	6.77	pH	
ORP	33.9	ORP	
Volume Purged	4.5 gal	Volume Purged	
Depth To Water	13.63	Depth To Water	
Time of Measurement	14:24	Time of Measurement	

Sample Rate: 150 mL/min

Sample ID: MW26-0701

Temperature (°C)		Temperature (°C)	
Conductivity		Conductivity	
pH		pH	
ORP		ORP	
Volume Purged		Volume Purged	
Depth To Water		Depth To Water	
Time of Measurement		Time of Measurement	

Additional Notes:

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING NUMBER: SB11C

SOIL BORING LOCATION: N of SB11B

Date: 12/2/15
Weather Conditions: Partly cloudy, 26°F
Start/End: 13:18-1420
Drilling Company/Rig Type: GeoTek / 6620 DT
Observer: Pollock/Shippen
Drilling/Sampling Method: Direct Push / Macro-Core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
SB11C-1	From: 0 to: 2.5 Time: 1322	0	2.2	Gravel, fine; with sand, fine to medium; trace silt; brown; dry; no odor.
-2	From: 2.5 to: 5 Time: 1323	2	2.2	Same as above
-3 *	From: 5 to: 10 Time: 1326	49	2.4	Same as above. Gas odor.
-4	From: 10 to: 15 Time: 1340	0	2.1	Gravel, fine; with sand, medium; brown; moist; light odor
-5	From: 15 to: 17.5 Time: 1357	4	1.8	Gravel, fine; with sand, medium; trace silt; dry 6" layer of fine sand at bottom; brown/dark brown; odor
-6 *	From: 17.5 to: 20 Time: 1358	508	1.8	Gravel, fine; with sand, medium; trace silt; brown; black staining; strong odor; moist
-7	From: 20 to: 22.5 Time: 1416	0	2.1	Gravel, fine; with sand, medium; trace silt; brown; saturated; no odor.
-8	From: 22.5 to: 25 Time: 1417	0	2.2	Same as above.
	From: to: Time:			end of boring at 25 feet
	From: to: Time:			
	From: to: Time:			

* not PAHs

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab 0 - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING LOCATION: E of MW2

SOIL BORING NUMBER: SB2B

Date: 12/2/15
Start/End: 1600 - 1650
Observer: Pollock/Shipper

Weather Conditions: Partly cloudy 25°F
Drilling Company/Rig Type: GeoTek / 6620 DT
Drilling/Sampling Method: Direct Push / Macro-Core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
-1	From: 0 to: 2.5 Time: 1608	0	2.5	Gravel, fine; with sand, coarse; brown; little silt; dry; no odor
-2	From: 2.5 to: 5 Time: 1611	0	2.5	Gravel, fine; with sand, coarse; brown; dry; no odor.
-3	From: 5 to: 7.5 Time: 1613	0	1.7	Gravel. fine; with sand, medium; brown; dry; no odor.
-4	From: 7.5 to: 10 Time: 1618	0	1.7	same as above.
-5	From: 10 to: 15 Time: 1622	0	2.5	Gravel, fine; with sand, fine to medium; brown; dry; no odor.
-6	From: 15 to: 17.5 Time: 1632	0	1.75	Gravel, fine; with sand, fine to medium; brown; saturated; no odor.
-7	From: 17.5 to: 20 Time: 1637	420	1.75	same as above with Light odor
-8	From: 20 to: 22.5 Time: 1648	3	2.0	Gravel, fine; with sand, medium; brown; saturated; light odor
-9	From: 22.5 to: 25 Time: 1653	0	2.0	same as above
	From: to: Time:			end of boring at 25 feet
	From: to: Time:			

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab 0 - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING LOCATION: W of MW3

SOIL BORING NUMBER: SB3B

Date: 12/2/15
Weather Conditions: Partly cloudy, 25°F
Start/End: 1100-1200
Drilling Company/Rig Type: GeoTek / 6620 DT
Observer: Pollock/Shippen
Drilling/Sampling Method: Direct Push / Macro-Core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
SB3B-1	From: 0 to: 2.5 Time: 1106	0	1.5	Gravel, fine; with sand, medium; little silt; brown; dry; no odor.
-2	From: 2.5 to: 5 Time: 1110	0	1.5	Gravel, fine; with sand, medium; some silt; brown; dry; no odor.
-3	From: 5 to: 7.5 Time: 1114	0	1.6	Gravel, fine; with sand, medium; trace silt; brown; dry; no odor
-4	From: 7.5 to: 10 Time: 1118	0	1.6	Same as above. (light odor.)
-5	From: 10 to: 12.5 Time: 1124	0	1.5	Gravel, fine; with sand, medium to coarse; trace silt; brown; dry; no odor.
-6	From: 12.5 to: 15 Time: 1128	0	1.6	Same (moist to saturated)
-7	From: 15 to: 17.5 Time: 1136	0	1.7	Gravel, fine; with sand, coarse; brown; saturated; no odor.
-8	From: 17.5 to: 20 Time: 1140	0	1.8	Same as above.
-9	From: 20 to: 22.5 Time: 1151	0	1.9	Gravel, fine; with sand, coarse; brown; saturated; no odor.
-10	From: 22.5 to: 25 Time: 1153	0	1.9	Same as above.
	From: to: Time:			end of boring at 25'

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab O - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING NUMBER: SB6B

SOIL BORING LOCATION: SE of NE corner of building

Date: 12/2/15

Weather Conditions: 24° F, cloudy

Start/End: 1000-1100

Drilling Company/Rig Type: GeoTek / 6620 DT

Observer: Pollock/Shippen

Drilling/Sampling Method: Macro-Core / Direct Push

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
SB6B1	From: 0 to: 2.5 Time: 1010	0	1.6'	Gravel, fine; with sand, medium; little silt; brown; dry; no odor.
SB6B-2	From: 2.5 to: 5 Time: 1014	0	1.6'	same as above.
-3	From: 5 to: 10 Time: 1021	0	2.4'	Gravel, fine; with sand, fine to medium; little silt; brown; dry; no odor.
-4	From: 10 to: 15 Time: 1027	0	2.4	Gravel, fine; with sand, fine to medium; little silt; brown; moist; no odor.
-5	From: 15 to: 17.5 Time: 1035	0	1.9	Gravel, fine; with sand, coarse; trace silt; brown; saturated; no odor
-6	From: 17.5 to: 20 Time: 1040	11	1.9	~~Gravel RP~~ Same as above. black staining at bottom 6"
-7	From: 20 to: 22.5 Time: 1049	0	2.0	Gravel, fine; with sand, coarse; brown; saturated; no odor
-8	From: 22.5 to: 25 Time: 1054	0	2.0	Same as above.
	From: to: Time:			end of boring at 25'
	From: to: Time:			
	From: to: Time:			

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab O - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Handah Muldoon

SOIL BORING LOCATION: E of MW7

SOIL BORING NUMBER: SB7B

Date: 12/2/15
Start/End: 1430 - 1505
Observer: Pollock/Shippen

Weather Conditions: Partly Cloudy, 26° F
Drilling Company/Rig Type: GeoTek / 6620 DT
Drilling/Sampling Method: Direct Push / Macro-Core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
SB7B-1	From: 0 to: 2.5 Time: 1432	0	2.2	Gravel, fine; with sand, fine to medium; trace silt; brown; dry; no odor
-2	From: 2.5 to: 5 Time: 1434	0	2.2	Same as above.
-3	From: 5 to: 10 Time: 1439	0	1.0	same as above. DRO jar not full (80% full)
-4	From: 10 to: 15 Time: 1453	0	0.5	Same as above DRO Jar 70% full
	From: 15 to: 20 Time:		Ø	No recovery
-5	From: 20 to: 25 Time: 1502	26	2.4	Gravel, fine; with sand, fine; brown; saturated; light odor
	From: to: Time:			end of boring at 25 feet
	From: to: Time:			
	From: to: Time:			
	From: to: Time:			
	From: to: Time:			

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense).

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab O - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING NUMBER: SB7C
SOIL BORING LOCATION: N of SB7B

Date: 12/2/15
Weather Conditions: Partly Cloudy 25°F

Start/End: 1510 - 1555
Drilling Company/Rig Type: GeoTek / 6620 DT

Observer: Pollock-Shipper
Drilling/Sampling Method: Direct Push / Macro-Core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
	From: 0 to: 5 Time: 1513	-	5.0	Gravel, fine; with sand, fine to medium; trace silt; brown; dry; light odor. No sample collected
SB7C-1	From: 5 to: 7.5 Time: 1523	0	1.7	same as above (no odor)
-2	From: 7.5 to: 10 Time: 1525	0	1.7	same as above
-3	From: 10 to: 15 Time: 1530	9	2.6	Gravel, fine; with sand, coarse; trace silt; brown; dry to moist; odor.
-4	From: 15 to: 17.5 Time: 1540	0	1.9	Gravel, fine; with sand, medium; trace silt; brown; moist; light odor.
☆ -5	From: 17.5 to: 20 Time: 1543	>1,000	1.9	Same as above (saturated, strong odor) PAH
-6	From: 20 to: 22.5 Time: 1554	2 / 11	2.5	Gravel, fine; with sand, medium; trace silt; brown; saturated; no odor.
-7	From: 22.5 to: 25 Time: 1558	2 / 9	2.5	Same as above
	From: to: Time:			end of boring at 25 feet
	From: to: Time:			
	From: to: Time:			

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab O - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING NUMBER: SB9B

SOIL BORING LOCATION: S-SW of MW9

Date: 12/2/15
Weather Conditions: Clear 23°F
Start/End: 1700 - 1745
Drilling Company/Rig Type: GeoTek / 6620 DT
Observer: Pollock/Shippen
Drilling/Sampling Method: Direct Push / Macro-core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
-1	From: 0 to: 2.5 Time:	0	1.8	Gravel, fine; with sand, coarse; trace silt; brown; dry; no odor.
-2	From: 2.5 to: 5 Time:	0	1.9	same as above (odor - rubber?)
-3	From: 5 to: 7.5 Time: 1714	0	1.7	Gravel, fine; with sand, medium; brown; dry; no odor
-4	From: 7.5 to: 10 Time: 1716	0	1.7	Same as above
-5	From: 10 to: 15 Time: 1721	0	2.5	Gravel, fine; with sand, medium; brown; dry; no odor
-6	From: 15 to: 17.5 Time: 1730	0	1.8	same as above (saturated)
-7 *	From: 17.5 to: 20 Time: 1730	943	1.8	same as above (odor) Duplicate SB9B-8 *
-9	From: 20 to: 22.5 Time: 1739	3 / 4	1.8	Gravel, fine; with sand, medium; brown; saturated; no odor
-10	From: 22.5 to: 25 Time: 1744	2 / 3	1.8	Same as above
	From: to: Time:			end of boring at 25 feet
	From: to: Time:			

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab 0 - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

BGES, INC.
ENVIRONMENTAL CONSULTANTS

BGES, INC.
SOIL BORING LOG

CLIENT: Tony Kim
PROJECT: Hannah Muldoon

SOIL BORING NUMBER: SB11B

SOIL BORING LOCATION: N of MW11

Date: 12/2/15

Weather Conditions: Partly cloudy, 26°F

Start/End: 1200 - 1300

Drilling Company/Rig Type: GeoTek / 6620 DT

Observer: Pollock / Shippen

Drilling/Sampling Method: Direct Push / Macro-Core

Sample Number	Depth (feet)	PID (ppm) Amb/H.S.	Recovery	Description
SB11B-1	From: 0 to: 2.5 Time: 1203	0	2.3	Gravel, fine; with sand, fine to medium; trace silt, brown; dry; odor. Duplicate SB11B-2
-3	From: 2.5 to: 5 Time: 1207	0	2.3	Same as above. (no odor)
-4	From: 5 to: 10 Time: 1210	0	1.0	Gravel, fine; with sand, medium; trace silt; brown; dry; light odor.
-5	From: 10 to: 12.5 Time: 1216	25	1.7	Same as above.
-6	From: 12.5 to: 15 Time: 1220	0	1.7	Same. (moist to saturated.)
-7	From: 15 to: 17.5 Time: 1224	159	1.9	Gravel, fine; with sand, coarse; dark brown to light brown; saturated; odor
-8	From: 17.5 to: 20 Time: 1229	2 / 717	1.9	Same as above. Duplicate SB11B-9
-10	From: 20 to: 22.5 Time: 1239	0	2.7	Gravel; fine; with sand, fine to medium; trace silt; brown; saturated; no odor.
-11	From: 22.5 to: 25 Time: 1240	0	2.8	Same as above.
	From: to: Time:			end of boring at 25 feet
	From: to: Time:			

Notes: Amb = ambient; H.S. = headspace; NC = not collected

Group Name (Estimated USCS Group Symbol), Group Descriptors; Constituents, and Constituent Descriptors; Color, Moisture, olfcatory or visual evidence of contamination), Relative Density/Consistency (ex: Well graded SAND (SW), fine; trace Gravel, fine; brown, moist, concrete fragments, 1" Silt layer at 12', Dense),

GRANULAR SOILS	TYPE OF SAMPLE	MOISTURE	Unified Soil Classification Symbol and Description
Blows / Ft-Density Use for SPT/MPT Methods Only 0 - 4 Very Loose 5 - 10 Loose 11 - 30 Medium Dense 31 - 50 Dense >50 Very Dense	SS - Split Spoon SSL - SS with Liner ST - Shelby Tube B - Bag GP - Geoprobe HA - Hand Auger G - Grab O - Other/Expl	DRY = No Free MOIST = Wet Hand WET = Free	CL - Lean Clay ML - Silt OL - Organic Clay/S CH - Fat Clay MH - Elastic Silt OH - Organic Clay/S PT - Peat GW - Well Graded Gravel GP - Poorly Graded Gravel GM - Silty Gravel GC - Clayey Gravel SW - Well Graded Sand SP - Poorly Graded Sand SM - Silty Sand SC - Clayey Sand

APPENDIX D
LABORATORY ANALYTICAL DATA

Laboratory Report of Analysis

To: BGES Inc.
1042 E 6th Avenue
Anchorage, AK 99501
(907) 644-2900

Report Number: **1153337**

Client Project: **Hanna Muldoon**

Dear Jayne Martin,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Victoria at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

SGS North America Inc.
Environmental Services – Alaska Division
Project Manager

Victoria Pennick
2015.07.17
17:04:31 -08'00'

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Print Date: 07/17/2015 3:23:55PM

Case Narrative

SGS Client: **BGES Inc.**
SGS Project: **1153337**
Project Name/Site: **Hanna Muldoon**
Project Contact: **Jayne Martin**

Refer to sample receipt form for information on sample condition.

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

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Laboratory Qualifiers

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

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

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

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
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., 1/2 of the LOQ)
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.

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Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MW9-0701	1153337001	07/01/2015	07/02/2015	Water (Surface, Eff., Ground)
MW26-0701	1153337002	07/01/2015	07/02/2015	Water (Surface, Eff., Ground)
MW7-0701	1153337003	07/01/2015	07/02/2015	Water (Surface, Eff., Ground)
Trip Blank	1153337004	07/01/2015	07/02/2015	Water (Surface, Eff., Ground)

Method	Method Description
AK101	AK101/8021 Combo.
SW8021B	AK101/8021 Combo.
AK102	DRO Low Volume (W)

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Detectable Results Summary

Client Sample ID: **MW7-0701**
Lab Sample ID: 1153337003
Volatile Fuels

Parameter	Result	Units
Benzene	2.78	ug/L
Ethylbenzene	3.15	ug/L
Gasoline Range Organics	0.369	mg/L
P & M -Xylene	4.29	ug/L

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Results of **MW9-0701**

Client Sample ID: **MW9-0701**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337001
Lab Project ID: 1153337

Collection Date: 07/01/15 11:38
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.600	U	0.600	0.180	mg/L	1		07/14/15 00:38
Surrogates								
5a Androstane (surr)	94.4		50-150		%	1		07/14/15 00:38

Batch Information

Analytical Batch: XFC11939
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 07/14/15 00:38
Container ID: 1153337001-D

Prep Batch: XXX33495
Prep Method: SW3520C
Prep Date/Time: 07/09/15 09:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 07/17/2015 3:23:59PM

Results of **MW9-0701**

Client Sample ID: **MW9-0701**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337001
Lab Project ID: 1153337

Collection Date: 07/01/15 11:38
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		07/07/15 19:21
Surrogates								
4-Bromofluorobenzene (surr)	103		50-150		%	1		07/07/15 19:21

Batch Information

Analytical Batch: VFC12507
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 07/07/15 19:21
Container ID: 1153337001-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.500	U	0.500	0.150	ug/L	1		07/07/15 19:21
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:21
o-Xylene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:21
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		07/07/15 19:21
Toluene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:21
Surrogates								
1,4-Difluorobenzene (surr)	84.4		77-115		%	1		07/07/15 19:21

Batch Information

Analytical Batch: VFC12507
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 07/07/15 19:21
Container ID: 1153337001-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Results of **MW26-0701**

Client Sample ID: **MW26-0701**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337002
Lab Project ID: 1153337

Collection Date: 07/01/15 14:26
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.600	U	0.600	0.180	mg/L	1		07/14/15 00:59
Surrogates								
5a Androstane (surr)	96.4		50-150		%	1		07/14/15 00:59

Batch Information

Analytical Batch: XFC11939
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 07/14/15 00:59
Container ID: 1153337002-D

Prep Batch: XXX33495
Prep Method: SW3520C
Prep Date/Time: 07/09/15 09:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 07/17/2015 3:23:59PM

Results of **MW26-0701**

Client Sample ID: **MW26-0701**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337002
Lab Project ID: 1153337

Collection Date: 07/01/15 14:26
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		07/07/15 19:40
Surrogates								
4-Bromofluorobenzene (surr)	102		50-150		%	1		07/07/15 19:40

Batch Information

Analytical Batch: VFC12507
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 07/07/15 19:40
Container ID: 1153337002-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.500	U	0.500	0.150	ug/L	1		07/07/15 19:40
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:40
o-Xylene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:40
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		07/07/15 19:40
Toluene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:40
Surrogates								
1,4-Difluorobenzene (surr)	84.3		77-115		%	1		07/07/15 19:40

Batch Information

Analytical Batch: VFC12507
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 07/07/15 19:40
Container ID: 1153337002-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:59PM

Results of **MW7-0701**

Client Sample ID: **MW7-0701**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337003
Lab Project ID: 1153337

Collection Date: 07/01/15 16:35
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	0.600	U	0.600	0.180	mg/L	1		07/14/15 01:19
Surrogates								
5a Androstane (surr)	99.3		50-150		%	1		07/14/15 01:19

Batch Information

Analytical Batch: XFC11939
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 07/14/15 01:19
Container ID: 1153337003-D

Prep Batch: XXX33495
Prep Method: SW3520C
Prep Date/Time: 07/09/15 09:55
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

Print Date: 07/17/2015 3:23:59PM

Results of **MW7-0701**

Client Sample ID: **MW7-0701**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337003
Lab Project ID: 1153337

Collection Date: 07/01/15 16:35
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.369		0.100	0.0310	mg/L	1		07/07/15 19:59
Surrogates								
4-Bromofluorobenzene (surr)	127		50-150		%	1		07/07/15 19:59

Batch Information

Analytical Batch: VFC12507
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 07/07/15 19:59
Container ID: 1153337003-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	2.78		0.500	0.150	ug/L	1		07/07/15 19:59
Ethylbenzene	3.15		1.00	0.310	ug/L	1		07/07/15 19:59
o-Xylene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:59
P & M -Xylene	4.29		2.00	0.620	ug/L	1		07/07/15 19:59
Toluene	1.00	U	1.00	0.310	ug/L	1		07/07/15 19:59
Surrogates								
1,4-Difluorobenzene (surr)	88.8		77-115		%	1		07/07/15 19:59

Batch Information

Analytical Batch: VFC12507
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 07/07/15 19:59
Container ID: 1153337003-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:59PM

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1153337004
Lab Project ID: 1153337

Collection Date: 07/01/15 11:38
Received Date: 07/02/15 08:36
Matrix: Water (Surface, Eff., Ground)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	0.100	U	0.100	0.0310	mg/L	1		07/07/15 18:43
Surrogates								
4-Bromofluorobenzene (surr)	103		50-150		%	1		07/07/15 18:43

Batch Information

Analytical Batch: VFC12507
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 07/07/15 18:43
Container ID: 1153337004-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.500	U	0.500	0.150	ug/L	1		07/07/15 18:43
Ethylbenzene	1.00	U	1.00	0.310	ug/L	1		07/07/15 18:43
o-Xylene	1.00	U	1.00	0.310	ug/L	1		07/07/15 18:43
P & M -Xylene	2.00	U	2.00	0.620	ug/L	1		07/07/15 18:43
Toluene	1.00	U	1.00	0.310	ug/L	1		07/07/15 18:43
Surrogates								
1,4-Difluorobenzene (surr)	85		77-115		%	1		07/07/15 18:43

Batch Information

Analytical Batch: VFC12507
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 07/07/15 18:43
Container ID: 1153337004-A

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 07/07/15 08:00
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:23:59PM

Method Blank

Blank ID: MB for HBN 1712748 [VXX/27546]
Blank Lab ID: 1275537

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1153337001, 1153337002, 1153337003, 1153337004

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.0500U	0.100	0.0310	mg/L
Surrogates				
4-Bromofluorobenzene (surr)	104	50-150		%

Batch Information

Analytical Batch: VFC12507
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 7/7/2015 4:49:00PM

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 7/7/2015 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1153337 [VXX27546]
Blank Spike Lab ID: 1275540
Date Analyzed: 07/07/2015 17:46

Spike Duplicate ID: LCSD for HBN 1153337 [VXX27546]
Spike Duplicate Lab ID: 1275541
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153337001, 1153337002, 1153337003, 1153337004

Results by **AK101**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	1.00	1.02	102	1.00	0.980	98	(60-120)	3.70	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.0500	107	107	0.0500	107	107	(50-150)	0.80	

Batch Information

Analytical Batch: **VFC12507**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX27546**
Prep Method: **SW5030B**
Prep Date/Time: **07/07/2015 08:00**
Spike Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 1.00 mg/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1712748 [VXX/27546]
Blank Lab ID: 1275537

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1153337001, 1153337002, 1153337003, 1153337004

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.250U	0.500	0.150	ug/L
Ethylbenzene	0.500U	1.00	0.310	ug/L
o-Xylene	0.500U	1.00	0.310	ug/L
P & M -Xylene	1.00U	2.00	0.620	ug/L
Toluene	0.500U	1.00	0.310	ug/L
Surrogates				
1,4-Difluorobenzene (surr)	83.2	77-115		%

Batch Information

Analytical Batch: VFC12507
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 7/7/2015 4:49:00PM

Prep Batch: VXX27546
Prep Method: SW5030B
Prep Date/Time: 7/7/2015 8:00:00AM
Prep Initial Wt./Vol.: 5 mL
Prep Extract Vol: 5 mL

Print Date: 07/17/2015 3:24:05PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1153337 [VXX27546]
Blank Spike Lab ID: 1275538
Date Analyzed: 07/07/2015 17:27

Spike Duplicate ID: LCSD for HBN 1153337 [VXX27546]
Spike Duplicate Lab ID: 1275539
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153337001, 1153337002, 1153337003, 1153337004

Results by **SW8021B**

	Blank Spike (ug/L)			Spike Duplicate (ug/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	100	98.1	98	100	96.2	96	(80-120)	1.90	(< 20)
Ethylbenzene	100	104	104	100	100	100	(75-125)	3.50	(< 20)
o-Xylene	100	105	105	100	101	101	(80-120)	3.40	(< 20)
P & M -Xylene	200	210	105	200	203	101	(75-130)	3.50	(< 20)
Toluene	100	101	101	100	99.0	99	(75-120)	2.30	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	50	94.6	95	50	98.8	99	(77-115)	4.40	

Batch Information

Analytical Batch: **VFC12507**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX27546**
Prep Method: **SW5030B**
Prep Date/Time: **07/07/2015 08:00**
Spike Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL
Dupe Init Wt./Vol.: 100 ug/L Extract Vol: 5 mL

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Method Blank

Blank ID: MB for HBN 1712836 [XXX/33495]
Blank Lab ID: 1275742

Matrix: Water (Surface, Eff., Ground)

QC for Samples:
1153337001, 1153337002, 1153337003

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	0.300U	0.600	0.180	mg/L
Surrogates				
5a Androstane (surr)	99.4	60-120		%

Batch Information

Analytical Batch: XFC11935
Analytical Method: AK102
Instrument: HP 7890A FID SV E F
Analyst: NLL
Analytical Date/Time: 7/12/2015 11:59:00AM

Prep Batch: XXX33495
Prep Method: SW3520C
Prep Date/Time: 7/9/2015 9:55:04AM
Prep Initial Wt./Vol.: 250 mL
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1153337 [XXX33495]
Blank Spike Lab ID: 1275743
Date Analyzed: 07/12/2015 12:20

Spike Duplicate ID: LCSD for HBN 1153337 [XXX33495]
Spike Duplicate Lab ID: 1275744
Matrix: Water (Surface, Eff., Ground)

QC for Samples: 1153337001, 1153337002, 1153337003

Results by **AK102**

	Blank Spike (mg/L)			Spike Duplicate (mg/L)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	20	21.7	108	20	23.0	115	(75-125)	5.80	(< 20)
Surrogates									
5a Androstane (surr)	0.4	105	105	0.4	118	118	(60-120)	11.80	

Batch Information

Analytical Batch: **XFC11935**
Analytical Method: **AK102**
Instrument: **HP 7890A FID SV E F**
Analyst: **NLL**

Prep Batch: **XXX33495**
Prep Method: **SW3520C**
Prep Date/Time: **07/09/2015 09:55**
Spike Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL
Dupe Init Wt./Vol.: 20 mg/L Extract Vol: 1 mL

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

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECO

1153337

Locations Nationwide

Alaska	Maryland
New Jersey	New York
North Carolina	Indiana
West Virgina	Kentucky

www.us.sgs.com

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

Section 1

CLIENT: BGES

CONTACT: Jayne Martin PHONE NO: 907 644 2900

PROJECT NAME: Hanna Muldoon PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Jayne Martin E-MAIL: Jayne@bgesinc.com

INVOICE TO: Jayne Martin QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative HCL GRO/BTEX AK101 / 8021B	Preservative HCL DRO (LV) / AK102 MV								REMARKS/ LOC ID
(1) A-E	~~MW7-0701~~ 5	07/01/15	11:38	Water	5	G	X	X								
(2) A-E	MW26-0701	07/01/15	14:26	Water	5	G	X	X								
(3) A-E	~~MW9-0701~~ MW7-0701 5	07/01/15	16:35	Water	5	G	X	X								
(4) A-C	Trip blank			Water	1		X									

Section 5

	Date	Time	
Relinquished By: (1)	7/2/15	08:36	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	7/2/15	0830	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: Level II

Requested Turnaround Time and/or Special Instructions:

Std 10 day

Temp Blank °C: 3.5/2.40

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

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

F083-Kit_Request_and_COC_Templates-Blank
Revised 2013-03-24

Sample IDs on COC
AND samples were
incorrect, per client.

IDs for 001/003 were
corrected, per client, need
to be updated in LIMS.

Client labeled on containers is
incorrect, but LIMS labels
are correct JAN 7/2/15

1153337

SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	☐ ☑	☑ ☐	☐ ☐	***Exemption permitted if sampler hand carries/delivers.***
Temperature blank compliant* (i.e., 0-6°C after CF)? *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: [1] _____ @ 3.5 _____ w/ Therm.ID: 240 _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ 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."	☑ ☐ ☐	☐ ☑ ☑	☐ ☐ ☐	***Exemption permitted if chilled & collected <8 hrs ago.*** ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery method (specify all that apply): ☑Client (hand carried) ☐USPS ☐Lynden ☐AK Air ☐Alert Courier ☐UPS ☐FedEx ☐RAVN ☐C&D Delivery ☐Carlile ☐Pen Air ☐Warp Speed ☐Other: _____ → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	☐	☑	☐	
	Yes	N/A	No	
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	☑ ☑ ☑	☐ ☐ ☐	☐ ☐ ☐	***Note: Refer to form F-083 "Sample Guide" for hold times.*** ***Note: If times differ <1hr, record details and login per COC.***
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): ☑Bubble Wrap ☐Separate plastic bags ☐Vermiculite ☐Other:	☑	☐	☐	
Were **proper containers** (type/mass/volume/preservative*) used? Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	☑ ☑ ☐ ☐	☐ ☐ ☐ ☑	☐ ☐ ☑ ☐	☐ ***Exemption permitted for metals (e.g., 200.8/6020A).*** Sample 1153337004C has a bubble of 6mm.
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	☑ ☐	☐ ☑	☐ ☐	
For **special handling** (e.g., "MI" soils, foreign soils, lab filter for dissolved…, lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	☐	☑	☐	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	☐	☑	☐	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	☐	☑	☐	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	☐	☑	☐	SRF Completed by: D.C 07/02/2015 PM notified:
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	☑	☐	☐	Peer Reviewed by: EDJ

Additional notes (if applicable):

7/2/15 JAN/VLP: Samples -1 and -3 sample ID were inverted. Client came in and changed the COC.

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

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1153337001-A	HCL to pH < 2	OK			
1153337001-B	HCL to pH < 2	OK			
1153337001-C	HCL to pH < 2	OK			
1153337001-D	HCL to pH < 2	OK			
1153337001-E	HCL to pH < 2	OK			
1153337002-A	HCL to pH < 2	OK			
1153337002-B	HCL to pH < 2	OK			
1153337002-C	HCL to pH < 2	OK			
1153337002-D	HCL to pH < 2	OK			
1153337002-E	HCL to pH < 2	OK			
1153337003-A	HCL to pH < 2	OK			
1153337003-B	HCL to pH < 2	OK			
1153337003-C	HCL to pH < 2	OK			
1153337003-D	HCL to pH < 2	OK			
1153337003-E	HCL to pH < 2	OK			
1153337004-A	HCL to pH < 2	OK			
1153337004-B	HCL to pH < 2	OK			
1153337004-C	HCL to pH < 2	BU			

Container Condition Glossary

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

OK - The container was received at an acceptable pH for the analysis requested.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
BU - The container was received with headspace greater than 6mm.

Laboratory Report of Analysis

To: BGES Inc.
1042 E 6th Avenue
Anchorage, AK 99501
(907) 644-2900

Report Number: **1156988**

Client Project: **Hanna Muldoon**

Dear Jayne Martin,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Victoria at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

SGS North America Inc.
Environmental Services – Alaska Division
Project Manager

Victoria Pennick
2015.12.16
17:15:20 -09'00'

Victoria Pennick Date
Project Manager
Victoria.Pennick@sgs.com

Print Date: 12/16/2015 12:19:20PM

Case Narrative

SGS Client: **BGES Inc.**
SGS Project: **1156988**
Project Name/Site: **Hanna Muldoon**
Project Contact: **Jayne Martin**

Refer to sample receipt form for information on sample condition.

SB2B-7-1202 (1156988001) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (173%) does not meet QC criteria due to matrix interference.

SB7C-5-1202 (1156988004) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (1860%) does not meet QC criteria due to matrix interference.

SB11B-8-1202 (1156988007) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (237%) does not meet QC criteria due to matrix interference.

SB11C-3-1202 (1156988008) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (186%) does not meet QC criteria due to matrix interference.

SB11C-6-1202 (1156988009) PS

AK101 - Surrogate recovery for 4-bromofluorobenzene (337%) does not meet QC criteria due to matrix interference.

1156988004MS (1306670) MS

8270D SIM - MS recovery for several analytes does not meet QC criteria. See LCS for accuracy requirements.

1156988004MSD (1306671) MSD

8270D SIM - MSD recovery for several analytes does not meet QC criteria. See LCS for accuracy requirements.

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

Report of Manual Integrations

Laboratory ID	Client Sample ID	Analytical Batch	Analyte	Reason
8270D SIMS (PAH)				
1156988004	SB7C-5-1202	XMS9114	Benzo[b]Fluoranthene	BLC
1306669	LCS for HBN 1726027 [XXX/34719	XMS9114	Benzo[k]fluoranthene	PNF

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

Print Date: 12/16/2015 12:19:21PM

Laboratory Qualifiers

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

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

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

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
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., 1/2 of the LOQ)
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.

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
SB2B-7-1202	1156988001	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB3B-7-1202	1156988002	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB6B-6-1202	1156988003	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB7C-5-1202	1156988004	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB9B-7-1202	1156988005	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB9B-8-1202	1156988006	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB11B-8-1202	1156988007	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB11C-3-1202	1156988008	12/02/2015	12/03/2015	Soil/Solid (dry weight)
SB11C-6-1202	1156988009	12/02/2015	12/03/2015	Soil/Solid (dry weight)
Trip Blank	1156988010	12/02/2015	12/03/2015	Soil/Solid (dry weight)

Method	Method Description
8270D SIMS (PAH)	8270 PAH SIM Semi-Volatiles GC/MS
AK101	AK101/8021 Combo. (S)
SW8021B	AK101/8021 Combo. (S)
AK102	Diesel Range Organics (S)
SM21 2540G	Percent Solids SM2540G

Detectable Results Summary

Client Sample ID: **SB2B-7-1202**
Lab Sample ID: 1156988001

	Parameter	Result	Units
Volatile Fuels	Benzene	146	ug/Kg
	Ethylbenzene	73.1	ug/Kg
	Gasoline Range Organics	43.1	mg/Kg
	o-Xylene	56.6	ug/Kg
	P & M -Xylene	209	ug/Kg
	Toluene	191	ug/Kg

Client Sample ID: **SB3B-7-1202**
Lab Sample ID: 1156988002

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	1.89	mg/Kg
	P & M -Xylene	54.3	ug/Kg
	Toluene	34.9	ug/Kg

Client Sample ID: **SB6B-6-1202**
Lab Sample ID: 1156988003

	Parameter	Result	Units
Volatile Fuels	Gasoline Range Organics	2.15	mg/Kg
	P & M -Xylene	81.1	ug/Kg
	Toluene	40.0	ug/Kg

Client Sample ID: **SB7C-5-1202**
Lab Sample ID: 1156988004

	Parameter	Result	Units
Polynuclear Aromatics GC/MS	1-Methylnaphthalene	4860	ug/Kg
	2-Methylnaphthalene	7340	ug/Kg
	Acenaphthene	36.5	ug/Kg
	Fluoranthene	9.94	ug/Kg
	Fluorene	30.3	ug/Kg
	Naphthalene	2150	ug/Kg
	Phenanthrene	37.7	ug/Kg
	Pyrene	15.2	ug/Kg
Semivolatile Organic Fuels	Diesel Range Organics	619	mg/Kg
Volatile Fuels	Benzene	2370	ug/Kg
	Ethylbenzene	3670	ug/Kg
	Gasoline Range Organics	545	mg/Kg
	o-Xylene	310	ug/Kg
	P & M -Xylene	7360	ug/Kg
	Toluene	1590	ug/Kg

Client Sample ID: **SB9B-7-1202**
Lab Sample ID: 1156988005

	Parameter	Result	Units
Volatile Fuels	Ethylbenzene	17.9	ug/Kg
	P & M -Xylene	81.4	ug/Kg
	Toluene	51.7	ug/Kg

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Detectable Results Summary

Client Sample ID: **SB9B-8-1202**
Lab Sample ID: 1156988006
Volatile Fuels

Parameter	Result	Units
Benzene	12.3	ug/Kg
Ethylbenzene	20.0	ug/Kg
o-Xylene	20.0	ug/Kg
P & M -Xylene	84.0	ug/Kg
Toluene	54.7	ug/Kg

Client Sample ID: **SB11B-8-1202**
Lab Sample ID: 1156988007
Volatile Fuels

Parameter	Result	Units
Benzene	310	ug/Kg
Ethylbenzene	174	ug/Kg
Gasoline Range Organics	99.1	mg/Kg
o-Xylene	48.0	ug/Kg
P & M -Xylene	103	ug/Kg
Toluene	319	ug/Kg

Client Sample ID: **SB11C-3-1202**
Lab Sample ID: 1156988008
Volatile Fuels

Parameter	Result	Units
Benzene	92.6	ug/Kg
Ethylbenzene	689	ug/Kg
Gasoline Range Organics	61.3	mg/Kg
o-Xylene	4820	ug/Kg
P & M -Xylene	9990	ug/Kg
Toluene	1440	ug/Kg

Client Sample ID: **SB11C-6-1202**
Lab Sample ID: 1156988009
Volatile Fuels

Parameter	Result	Units
Benzene	409	ug/Kg
Ethylbenzene	119	ug/Kg
Gasoline Range Organics	195	mg/Kg
o-Xylene	23.8	ug/Kg
P & M -Xylene	109	ug/Kg
Toluene	237	ug/Kg

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Results of **SB2B-7-1202**

Client Sample ID: **SB2B-7-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988001
Lab Project ID: 1156988

Collection Date: 12/02/15 16:37
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):89.7
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	21.9	U	21.9	6.80	mg/Kg	1		12/07/15 20:51
Surrogates								
5a Androstane (surr)	80.2		50-150		%	1		12/07/15 20:51

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 20:51
Container ID: 1156988001-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.484 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB2B-7-1202**

Client Sample ID: **SB2B-7-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988001
Lab Project ID: 1156988

Collection Date: 12/02/15 16:37
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):89.7
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	43.1		2.03	0.609	mg/Kg	1		12/07/15 17:19
Surrogates								
4-Bromofluorobenzene (surr)	173	*	50-150		%	1		12/07/15 17:19

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 17:19
Container ID: 1156988001-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 16:37
Prep Initial Wt./Vol.: 95.725 g
Prep Extract Vol: 34.8582 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	146		10.1	3.25	ug/Kg	1		12/07/15 17:19
Ethylbenzene	73.1		20.3	6.33	ug/Kg	1		12/07/15 17:19
o-Xylene	56.6		20.3	6.33	ug/Kg	1		12/07/15 17:19
P & M -Xylene	209		40.6	12.2	ug/Kg	1		12/07/15 17:19
Toluene	191		20.3	6.33	ug/Kg	1		12/07/15 17:19
Surrogates								
1,4-Difluorobenzene (surr)	89.8		72-119		%	1		12/07/15 17:19

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 17:19
Container ID: 1156988001-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 16:37
Prep Initial Wt./Vol.: 95.725 g
Prep Extract Vol: 34.8582 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB3B-7-1202**

Client Sample ID: **SB3B-7-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988002
Lab Project ID: 1156988

Collection Date: 12/02/15 11:36
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.1
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	22.1	U	22.1	6.85	mg/Kg	1		12/07/15 21:20
Surrogates								
5a Androstane (surr)	85.7		50-150		%	1		12/07/15 21:20

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 21:20
Container ID: 1156988002-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.143 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB3B-7-1202**

Client Sample ID: **SB3B-7-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988002
Lab Project ID: 1156988

Collection Date: 12/02/15 11:36
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.1
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.89		1.64	0.493	mg/Kg	1		12/07/15 17:38
Surrogates								
4-Bromofluorobenzene (surr)	121		50-150		%	1		12/07/15 17:38

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 17:38
Container ID: 1156988002-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 11:36
Prep Initial Wt./Vol.: 126.415 g
Prep Extract Vol: 37.4806 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	8.22	U	8.22	2.63	ug/Kg	1		12/07/15 17:38
Ethylbenzene	16.4	U	16.4	5.13	ug/Kg	1		12/07/15 17:38
o-Xylene	16.4	U	16.4	5.13	ug/Kg	1		12/07/15 17:38
P & M -Xylene	54.3		32.9	9.87	ug/Kg	1		12/07/15 17:38
Toluene	34.9		16.4	5.13	ug/Kg	1		12/07/15 17:38
Surrogates								
1,4-Difluorobenzene (surr)	82.7		72-119		%	1		12/07/15 17:38

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 17:38
Container ID: 1156988002-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 11:36
Prep Initial Wt./Vol.: 126.415 g
Prep Extract Vol: 37.4806 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB6B-6-1202**

Client Sample ID: **SB6B-6-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988003
Lab Project ID: 1156988

Collection Date: 12/02/15 10:40
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):88.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	22.4	U	22.4	6.95	mg/Kg	1		12/07/15 21:30
Surrogates								
5a Androstane (surr)	81.7		50-150		%	1		12/07/15 21:30

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 21:30
Container ID: 1156988003-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.203 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB6B-6-1202**

Client Sample ID: **SB6B-6-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988003
Lab Project ID: 1156988

Collection Date: 12/02/15 10:40
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):88.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.15		1.97	0.591	mg/Kg	1		12/07/15 17:57
Surrogates								
4-Bromofluorobenzene (surr)	136		50-150		%	1		12/07/15 17:57

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 17:57
Container ID: 1156988003-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 10:40
Prep Initial Wt./Vol.: 106.278 g
Prep Extract Vol: 37.0969 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	9.85	U	9.85	3.15	ug/Kg	1		12/07/15 17:57
Ethylbenzene	19.7	U	19.7	6.14	ug/Kg	1		12/07/15 17:57
o-Xylene	19.7	U	19.7	6.14	ug/Kg	1		12/07/15 17:57
P & M -Xylene	81.1		39.4	11.8	ug/Kg	1		12/07/15 17:57
Toluene	40.0		19.7	6.14	ug/Kg	1		12/07/15 17:57
Surrogates								
1,4-Difluorobenzene (surr)	84.5		72-119		%	1		12/07/15 17:57

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 17:57
Container ID: 1156988003-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 10:40
Prep Initial Wt./Vol.: 106.278 g
Prep Extract Vol: 37.0969 mL

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

Results of **SB7C-5-1202**

Client Sample ID: **SB7C-5-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988004
Lab Project ID: 1156988

Collection Date: 12/02/15 15:43
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.9
Location:

Results by **Polynuclear Aromatics GC/MS**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
1-Methylnaphthalene	4860		543	163	ug/Kg	100		12/11/15 22:07
2-Methylnaphthalene	7340		543	163	ug/Kg	100		12/11/15 22:07
Acenaphthene	36.5		5.43	1.63	ug/Kg	1		12/09/15 21:53
Acenaphthylene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Anthracene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Benzo(a)Anthracene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Benzo[a]pyrene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Benzo[b]Fluoranthene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Benzo[g,h,i]perylene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Benzo[k]fluoranthene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Chrysene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Dibenzo[a,h]anthracene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Fluoranthene	9.94		5.43	1.63	ug/Kg	1		12/09/15 21:53
Fluorene	30.3		5.43	1.63	ug/Kg	1		12/09/15 21:53
Indeno[1,2,3-c,d] pyrene	5.43	U	5.43	1.63	ug/Kg	1		12/09/15 21:53
Naphthalene	2150		543	163	ug/Kg	100		12/11/15 22:07
Phenanthrene	37.7		5.43	1.63	ug/Kg	1		12/09/15 21:53
Pyrene	15.2		5.43	1.63	ug/Kg	1		12/09/15 21:53
Surrogates								
2-Fluorobiphenyl (surr)	72.4		46-115		%	1		12/09/15 21:53
Terphenyl-d14 (surr)	101		58-133		%	1		12/09/15 21:53

Batch Information

Analytical Batch: XMS9114
Analytical Method: 8270D SIMS (PAH)
Analyst: MCM
Analytical Date/Time: 12/09/15 21:53
Container ID: 1156988004-A

Prep Batch: XXX34719
Prep Method: SW3550C
Prep Date/Time: 12/08/15 10:37
Prep Initial Wt./Vol.: 22.802 g
Prep Extract Vol: 1 mL

Analytical Batch: XMS9117
Analytical Method: 8270D SIMS (PAH)
Analyst: NRB
Analytical Date/Time: 12/11/15 22:07
Container ID: 1156988004-A

Prep Batch: XXX34719
Prep Method: SW3550C
Prep Date/Time: 12/08/15 10:37
Prep Initial Wt./Vol.: 22.802 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB7C-5-1202**

Client Sample ID: **SB7C-5-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988004
Lab Project ID: 1156988

Collection Date: 12/02/15 15:43
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	619		22.0	6.81	mg/Kg	1		12/07/15 21:40
Surrogates								
5a Androstane (surr)	85.5		50-150		%	1		12/07/15 21:40

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 21:40
Container ID: 1156988004-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.056 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB7C-5-1202**

Client Sample ID: **SB7C-5-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988004
Lab Project ID: 1156988

Collection Date: 12/02/15 15:43
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	545		176	52.8	mg/Kg	100		12/09/15 13:21
Surrogates								
4-Bromofluorobenzene (surr)	1860	*	50-150		%	100		12/09/15 13:21

Batch Information

Analytical Batch: VFC12847
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 12/09/15 13:21
Container ID: 1156988004-B

Prep Batch: VXX28343
Prep Method: SW5035A
Prep Date/Time: 12/02/15 15:43
Prep Initial Wt./Vol.: 109.364 g
Prep Extract Vol: 34.9888 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	2370		88.0	28.2	ug/Kg	10		12/09/15 13:40
Ethylbenzene	3670		176	54.9	ug/Kg	10		12/09/15 13:40
o-Xylene	310		176	54.9	ug/Kg	10		12/09/15 13:40
P & M -Xylene	7360		352	106	ug/Kg	10		12/09/15 13:40
Toluene	1590		176	54.9	ug/Kg	10		12/09/15 13:40
Surrogates								
1,4-Difluorobenzene (surr)	86.8		72-119		%	10		12/09/15 13:40

Batch Information

Analytical Batch: VFC12847
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 12/09/15 13:40
Container ID: 1156988004-B

Prep Batch: VXX28343
Prep Method: SW5035A
Prep Date/Time: 12/02/15 15:43
Prep Initial Wt./Vol.: 109.364 g
Prep Extract Vol: 34.9888 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB9B-7-1202**

Client Sample ID: **SB9B-7-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988005
Lab Project ID: 1156988

Collection Date: 12/02/15 17:30
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.6
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	21.9	U	21.9	6.79	mg/Kg	1		12/07/15 21:50
Surrogates								
5a Androstane (surr)	86.4		50-150		%	1		12/07/15 21:50

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 21:50
Container ID: 1156988005-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.246 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB9B-7-1202**

Client Sample ID: **SB9B-7-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988005
Lab Project ID: 1156988

Collection Date: 12/02/15 17:30
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):90.6
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.77	U	1.77	0.531	mg/Kg	1		12/09/15 12:24
Surrogates								
4-Bromofluorobenzene (surr)	125		50-150		%	1		12/09/15 12:24

Batch Information

Analytical Batch: VFC12847
Analytical Method: AK101
Analyst: CRD
Analytical Date/Time: 12/09/15 12:24
Container ID: 1156988005-B

Prep Batch: VXX28343
Prep Method: SW5035A
Prep Date/Time: 12/02/15 17:30
Prep Initial Wt./Vol.: 110.516 g
Prep Extract Vol: 35.4211 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	8.85	U	8.85	2.83	ug/Kg	1		12/09/15 12:24
Ethylbenzene	17.9		17.7	5.52	ug/Kg	1		12/09/15 12:24
o-Xylene	17.7	U	17.7	5.52	ug/Kg	1		12/09/15 12:24
P & M -Xylene	81.4		35.4	10.6	ug/Kg	1		12/09/15 12:24
Toluene	51.7		17.7	5.52	ug/Kg	1		12/09/15 12:24
Surrogates								
1,4-Difluorobenzene (surr)	84.4		72-119		%	1		12/09/15 12:24

Batch Information

Analytical Batch: VFC12847
Analytical Method: SW8021B
Analyst: CRD
Analytical Date/Time: 12/09/15 12:24
Container ID: 1156988005-B

Prep Batch: VXX28343
Prep Method: SW5035A
Prep Date/Time: 12/02/15 17:30
Prep Initial Wt./Vol.: 110.516 g
Prep Extract Vol: 35.4211 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB9B-8-1202**

Client Sample ID: **SB9B-8-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988006
Lab Project ID: 1156988

Collection Date: 12/02/15 17:30
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):89.9
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	22.0	U	22.0	6.81	mg/Kg	1		12/07/15 22:00
Surrogates								
5a Androstane (surr)	85.6		50-150		%	1		12/07/15 22:00

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 22:00
Container ID: 1156988006-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.354 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB9B-8-1202**

Client Sample ID: **SB9B-8-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988006
Lab Project ID: 1156988

Collection Date: 12/02/15 17:30
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):89.9
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.74	U	1.74	0.521	mg/Kg	1		12/08/15 17:26
Surrogates								
4-Bromofluorobenzene (surr)	117		50-150		%	1		12/08/15 17:26

Batch Information

Analytical Batch: VFC12845
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/08/15 17:26
Container ID: 1156988006-B

Prep Batch: VXX28341
Prep Method: SW5035A
Prep Date/Time: 12/02/15 17:30
Prep Initial Wt./Vol.: 118.24 g
Prep Extract Vol: 36.9031 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	12.3		8.68	2.78	ug/Kg	1		12/08/15 17:26
Ethylbenzene	20.0		17.4	5.41	ug/Kg	1		12/08/15 17:26
o-Xylene	20.0		17.4	5.41	ug/Kg	1		12/08/15 17:26
P & M -Xylene	84.0		34.7	10.4	ug/Kg	1		12/08/15 17:26
Toluene	54.7		17.4	5.41	ug/Kg	1		12/08/15 17:26
Surrogates								
1,4-Difluorobenzene (surr)	83.1		72-119		%	1		12/08/15 17:26

Batch Information

Analytical Batch: VFC12845
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/08/15 17:26
Container ID: 1156988006-B

Prep Batch: VXX28341
Prep Method: SW5035A
Prep Date/Time: 12/02/15 17:30
Prep Initial Wt./Vol.: 118.24 g
Prep Extract Vol: 36.9031 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB11B-8-1202**

Client Sample ID: **SB11B-8-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988007
Lab Project ID: 1156988

Collection Date: 12/02/15 12:29
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):87.5
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	22.6	U	22.6	7.01	mg/Kg	1		12/07/15 22:10
Surrogates								
5a Androstane (surr)	87.8		50-150		%	1		12/07/15 22:10

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 22:10
Container ID: 1156988007-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.35 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB11B-8-1202**

Client Sample ID: **SB11B-8-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988007
Lab Project ID: 1156988

Collection Date: 12/02/15 12:29
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):87.5
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	99.1		19.0	5.70	mg/Kg	10		12/07/15 19:12
Surrogates								
4-Bromofluorobenzene (surr)	237	*	50-150		%	10		12/07/15 19:12

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 19:12
Container ID: 1156988007-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 12:29
Prep Initial Wt./Vol.: 120.74 g
Prep Extract Vol: 40.1157 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	310		94.9	30.4	ug/Kg	10		12/07/15 19:12
Ethylbenzene	174		19.0	5.92	ug/Kg	1		12/10/15 19:52
o-Xylene	48.0		19.0	5.92	ug/Kg	1		12/10/15 19:52
P & M -Xylene	103		38.0	11.4	ug/Kg	1		12/10/15 19:52
Toluene	319		190	59.2	ug/Kg	10		12/07/15 19:12
Surrogates								
1,4-Difluorobenzene (surr)	87.4		72-119		%	10		12/07/15 19:12

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 19:12
Container ID: 1156988007-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 12:29
Prep Initial Wt./Vol.: 120.74 g
Prep Extract Vol: 40.1157 mL

Analytical Batch: VFC12848
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/10/15 19:52
Container ID: 1156988007-B

Prep Batch: VXX28347
Prep Method: SW5035A
Prep Date/Time: 12/02/15 12:29
Prep Initial Wt./Vol.: 120.74 g
Prep Extract Vol: 40.1157 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB11C-3-1202**

Client Sample ID: **SB11C-3-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988008
Lab Project ID: 1156988

Collection Date: 12/02/15 13:26
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	84.3	U	84.3	26.1	mg/Kg	4		12/07/15 22:30
Surrogates								
5a Androstane (surr)	91.2		50-150		%	4		12/07/15 22:30

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 22:30
Container ID: 1156988008-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.18 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB11C-3-1202**

Client Sample ID: **SB11C-3-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988008
Lab Project ID: 1156988

Collection Date: 12/02/15 13:26
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):94.4
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	61.3		3.81	1.14	mg/Kg	2		12/07/15 19:31
Surrogates								
4-Bromofluorobenzene (surr)	186	*	50-150		%	2		12/07/15 19:31

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 19:31
Container ID: 1156988008-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 13:26
Prep Initial Wt./Vol.: 82.407 g
Prep Extract Vol: 29.643 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	92.6		19.1	6.10	ug/Kg	2		12/07/15 19:31
Ethylbenzene	689		38.1	11.9	ug/Kg	2		12/07/15 19:31
o-Xylene	4820		38.1	11.9	ug/Kg	2		12/07/15 19:31
P & M -Xylene	9990		76.2	22.9	ug/Kg	2		12/07/15 19:31
Toluene	1440		38.1	11.9	ug/Kg	2		12/07/15 19:31
Surrogates								
1,4-Difluorobenzene (surr)	85.1		72-119		%	2		12/07/15 19:31

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 19:31
Container ID: 1156988008-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 13:26
Prep Initial Wt./Vol.: 82.407 g
Prep Extract Vol: 29.643 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB11C-6-1202**

Client Sample ID: **SB11C-6-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988009
Lab Project ID: 1156988

Collection Date: 12/02/15 13:58
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):87.8
Location:

Results by **Semivolatile Organic Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	22.7	U	22.7	7.05	mg/Kg	1		12/07/15 22:20
Surrogates								
5a Androstane (surr)	85.8		50-150		%	1		12/07/15 22:20

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Analyst: NLL
Analytical Date/Time: 12/07/15 22:20
Container ID: 1156988009-A

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/04/15 10:24
Prep Initial Wt./Vol.: 30.046 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:25PM

Results of **SB11C-6-1202**

Client Sample ID: **SB11C-6-1202**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988009
Lab Project ID: 1156988

Collection Date: 12/02/15 13:58
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):87.8
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	195		18.7	5.61	mg/Kg	10		12/07/15 19:50
Surrogates								
4-Bromofluorobenzene (surr)	337	*	50-150		%	10		12/07/15 19:50

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 19:50
Container ID: 1156988009-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 13:58
Prep Initial Wt./Vol.: 120.737 g
Prep Extract Vol: 39.6947 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	409		9.36	2.99	ug/Kg	1		12/07/15 20:46
Ethylbenzene	119		18.7	5.84	ug/Kg	1		12/07/15 20:46
o-Xylene	23.8		18.7	5.84	ug/Kg	1		12/07/15 20:46
P & M -Xylene	109		37.4	11.2	ug/Kg	1		12/07/15 20:46
Toluene	237		18.7	5.84	ug/Kg	1		12/07/15 20:46
Surrogates								
1,4-Difluorobenzene (surr)	118		72-119		%	1		12/07/15 20:46

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 20:46
Container ID: 1156988009-B

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 13:58
Prep Initial Wt./Vol.: 120.737 g
Prep Extract Vol: 39.6947 mL

Print Date: 12/16/2015 12:19:25PM

Results of **Trip Blank**

Client Sample ID: **Trip Blank**
Client Project ID: **Hanna Muldoon**
Lab Sample ID: 1156988010
Lab Project ID: 1156988

Collection Date: 12/02/15 10:40
Received Date: 12/03/15 14:09
Matrix: Soil/Solid (dry weight)
Solids (%):
Location:

Results by **Volatile Fuels**

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	2.49	U	2.49	0.747	mg/Kg	1		12/07/15 16:04
Surrogates								
4-Bromofluorobenzene (surr)	97.2		50-150		%	1		12/07/15 16:04

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Analyst: S.P
Analytical Date/Time: 12/07/15 16:04
Container ID: 1156988010-A

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 10:40
Prep Initial Wt./Vol.: 50.228 g
Prep Extract Vol: 25 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	12.4	U	12.4	3.98	ug/Kg	1		12/07/15 16:04
Ethylbenzene	24.9	U	24.9	7.76	ug/Kg	1		12/07/15 16:04
o-Xylene	24.9	U	24.9	7.76	ug/Kg	1		12/07/15 16:04
P & M -Xylene	49.8	U	49.8	14.9	ug/Kg	1		12/07/15 16:04
Toluene	24.9	U	24.9	7.76	ug/Kg	1		12/07/15 16:04
Surrogates								
1,4-Difluorobenzene (surr)	87		72-119		%	1		12/07/15 16:04

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Analyst: S.P
Analytical Date/Time: 12/07/15 16:04
Container ID: 1156988010-A

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/02/15 10:40
Prep Initial Wt./Vol.: 50.228 g
Prep Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1725985 [SPT/9804]
Blank Lab ID: 1306510

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988001, 1156988002, 1156988003, 1156988004, 1156988005, 1156988006, 1156988007, 1156988008, 1156988009

Results by **SM21 2540G**

Parameter	Results	LOQ/CL	DL	Units
Total Solids	100			%

Batch Information

Analytical Batch: SPT9804
Analytical Method: SM21 2540G
Instrument:
Analyst: MEV
Analytical Date/Time: 12/4/2015 4:27:00PM

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Duplicate Sample Summary

Original Sample ID: 1156988009
Duplicate Sample ID: 1306511

Analysis Date: 12/04/2015 16:27
Matrix: Soil/Solid (dry weight)

QC for Samples:

1156988001, 1156988002, 1156988003, 1156988004, 1156988005, 1156988006, 1156988007, 1156988008, 1156988009

Results by **SM21 2540G**

NAME	Original	Duplicate	Units	RPD (%)	RPD CL
Total Solids	87.8	90.7	%	3.20	(< 15)

Batch Information

Analytical Batch: SPT9804
Analytical Method: SM21 2540G
Instrument:
Analyst: MEV

Print Date: 12/16/2015 12:19:29PM

Method Blank

Blank ID: MB for HBN 1726040 [VXX/28332]
Blank Lab ID: 1306706

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988001, 1156988002, 1156988003, 1156988004, 1156988007, 1156988008, 1156988009, 1156988010

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	84	50-150		%

Batch Information

Analytical Batch: VFC12844
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/7/2015 12:36:00PM

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/7/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28332]
Blank Spike Lab ID: 1306709
Date Analyzed: 12/07/2015 13:33

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28332]
Spike Duplicate Lab ID: 1306710
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988001, 1156988002, 1156988003, 1156988004, 1156988007, 1156988008, 1156988009, 1156988010

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.4	107	12.5	12.8	102	(60-120)	4.80	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	90.5	91	1.25	86.6	87	(50-150)	4.40	

Batch Information

Analytical Batch: **VFC12844**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **S.P**

Prep Batch: **VXX28332**
Prep Method: **SW5035A**
Prep Date/Time: **12/07/2015 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1726040 [VXX/28332]
Blank Lab ID: 1306706

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988001, 1156988002, 1156988003, 1156988004, 1156988007, 1156988008, 1156988009, 1156988010

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	16.8J	50.0	15.0	ug/Kg
Toluene	10.8J	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	85.3	72-119		%

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/7/2015 12:36:00PM

Prep Batch: VXX28332
Prep Method: SW5035A
Prep Date/Time: 12/7/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28332]
Blank Spike Lab ID: 1306707
Date Analyzed: 12/07/2015 12:55

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28332]
Spike Duplicate Lab ID: 1306708
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988001, 1156988002, 1156988003, 1156988004, 1156988007, 1156988008, 1156988009, 1156988010

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1380	111	1250	1470	118	(75-125)	6.30	(< 20)
Ethylbenzene	1250	1360	109	1250	1410	113	(75-125)	3.60	(< 20)
o-Xylene	1250	1280	103	1250	1350	108	(75-125)	4.70	(< 20)
P & M -Xylene	2500	2680	107	2500	2770	111	(80-125)	3.30	(< 20)
Toluene	1250	1370	110	1250	1420	114	(70-125)	3.80	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	87.9	88	1250	91.7	92	(72-119)	4.20	

Batch Information

Analytical Batch: **VFC12844**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **S.P**

Prep Batch: **VXX28332**
Prep Method: **SW5035A**
Prep Date/Time: **12/07/2015 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1156992001
MS Sample ID: 1306711 MS
MSD Sample ID: 1306712 MSD

Analysis Date: 12/07/2015 16:23
Analysis Date: 12/07/2015 16:42
Analysis Date: 12/07/2015 17:01
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988001, 1156988002, 1156988003, 1156988004, 1156988007, 1156988008, 1156988009, 1156988010

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	207U	5577	6155	110	5577	6141	110	75-125	0.20	(< 20)
Ethylbenzene	414U	5577	5739	103	5577	5958	107	75-125	3.80	(< 20)
o-Xylene	414U	5577	5514	99	5577	5796	104	75-125	4.90	(< 20)
P & M -Xylene	827U	11127	11197	101	11127	11761	105	80-125	4.70	(< 20)
Toluene	414U	5577	5901	106	5577	6028	108	70-125	2.00	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		5577	5028	90	5577	5007	90	72-119	0.47	

Batch Information

Analytical Batch: VFC12844
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/7/2015 4:42:00PM

Prep Batch: VXX28332
Prep Method: AK101 Extraction (S)
Prep Date/Time: 12/7/2015 8:00:00AM
Prep Initial Wt./Vol.: 78.96g
Prep Extract Vol: 25.00mL

Print Date: 12/16/2015 12:19:37PM

Method Blank

Blank ID: MB for HBN 1726080 [VXX/28341]
Blank Lab ID: 1306835

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988006

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	84.8	50-150		%

Batch Information

Analytical Batch: VFC12845
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/8/2015 1:21:00PM

Prep Batch: VXX28341
Prep Method: SW5035A
Prep Date/Time: 12/8/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28341]
Blank Spike Lab ID: 1306838
Date Analyzed: 12/08/2015 14:17

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28341]
Spike Duplicate Lab ID: 1306839
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988006

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	12.5	13.1	105	12.5	13.8	110	(60-120)	5.00	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	1.25	88.1	88	1.25	89.6	90	(50-150)	1.70	

Batch Information

Analytical Batch: **VFC12845**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **S.P**

Prep Batch: **VXX28341**
Prep Method: **SW5035A**
Prep Date/Time: **12/08/2015 08:00**
Spike Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 12.5 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1726080 [VXX/28341]
Blank Lab ID: 1306835

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988006

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	6.25U	12.5	4.00	ug/Kg
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	25.0U	50.0	15.0	ug/Kg
Toluene	8.25J	25.0	7.80	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	84.4	72-119		%

Batch Information

Analytical Batch: VFC12845
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/8/2015 1:21:00PM

Prep Batch: VXX28341
Prep Method: SW5035A
Prep Date/Time: 12/8/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 12/16/2015 12:19:41PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28341]
Blank Spike Lab ID: 1306836
Date Analyzed: 12/08/2015 13:40

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28341]
Spike Duplicate Lab ID: 1306837
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988006

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	1250	1360	109	1250	1350	108	(75-125)	0.76	(< 20)
Ethylbenzene	1250	1340	107	1250	1330	106	(75-125)	0.41	(< 20)
o-Xylene	1250	1270	102	1250	1290	103	(75-125)	1.50	(< 20)
P & M -Xylene	2500	2620	105	2500	2620	105	(80-125)	0.23	(< 20)
Toluene	1250	1340	107	1250	1330	107	(70-125)	0.65	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	89.4	89	1250	88.3	88	(72-119)	1.30	

Batch Information

Analytical Batch: **VFC12845**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **S.P**

Prep Batch: **VXX28341**
Prep Method: **SW5035A**
Prep Date/Time: **12/08/2015 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1306834
MS Sample ID: 1306840 MS
MSD Sample ID: 1306841 MSD

Analysis Date: 12/08/2015 16:29
Analysis Date: 12/08/2015 16:48
Analysis Date: 12/08/2015 17:07
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1156988006

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	6.22	566	619	108	566	616	108	75-125	0.57	(< 20)
Ethylbenzene	10.4J	566	621	108	566	617	107	75-125	0.64	(< 20)
o-Xylene	8.60J	566	581	101	566	579	101	75-125	0.41	(< 20)
P & M -Xylene	48.6	1130	1240	105	1130	1230	104	80-125	0.65	(< 20)
Toluene	37.0	566	623	104	566	631	105	70-125	1.30	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		566	485	86	566	488	86	72-119	0.60	

Batch Information

Analytical Batch: VFC12845
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/8/2015 4:48:00PM

Prep Batch: VXX28341
Prep Method: AK101 Extraction (S)
Prep Date/Time: 12/8/2015 8:00:00AM
Prep Initial Wt./Vol.: 110.52g
Prep Extract Vol: 25.00mL

Print Date: 12/16/2015 12:19:43PM

Method Blank

Blank ID: MB for HBN 1726101 [VXX/28343]
Blank Lab ID: 1306922

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988004, 1156988005

Results by **AK101**

Parameter	Results	LOQ/CL	DL	Units
Gasoline Range Organics	0.00885U	0.0177	0.00531	mg/Kg
Surrogates				
4-Bromofluorobenzene (surr)	87.3	50-150		%

Batch Information

Analytical Batch: VFC12847
Analytical Method: AK101
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 12/9/2015 10:50:00AM

Prep Batch: VXX28343
Prep Method: SW5035A
Prep Date/Time: 12/9/2015 8:00:00AM
Prep Initial Wt./Vol.: 7057.22 g
Prep Extract Vol: 25 mL

Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28343]
Blank Spike Lab ID: 1306925
Date Analyzed: 12/09/2015 11:47

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28343]
Spike Duplicate Lab ID: 1306926
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988004, 1156988005

Results by **AK101**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Gasoline Range Organics	0.0886	0.0903	102	0.0886	0.0935	106	(60-120)	3.50	(< 20)
Surrogates									
4-Bromofluorobenzene (surr)	0.00886	88.9	89	0.00886	88.4	88	(50-150)	0.61	

Batch Information

Analytical Batch: **VFC12847**
Analytical Method: **AK101**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX28343**
Prep Method: **SW5035A**
Prep Date/Time: **12/09/2015 08:00**
Spike Init Wt./Vol.: 0.0886 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 0.0886 mg/Kg Extract Vol: 25 mL

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Method Blank

Blank ID: MB for HBN 1726101 [VXX/28343]
Blank Lab ID: 1306922

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988004, 1156988005

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Benzene	0.0443U	0.0886	0.0283	ug/Kg
Ethylbenzene	0.0885U	0.177	0.0553	ug/Kg
o-Xylene	0.0885U	0.177	0.0553	ug/Kg
P & M -Xylene	0.113J	0.354	0.106	ug/Kg
Toluene	0.0638J	0.177	0.0553	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	85.9	72-119		%

Batch Information

Analytical Batch: VFC12847
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 12/9/2015 10:50:00AM

Prep Batch: VXX28343
Prep Method: SW5035A
Prep Date/Time: 12/9/2015 8:00:00AM
Prep Initial Wt./Vol.: 7057.22 g
Prep Extract Vol: 25 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28343]
Blank Spike Lab ID: 1306923
Date Analyzed: 12/09/2015 11:09

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28343]
Spike Duplicate Lab ID: 1306924
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988004, 1156988005

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	8.86	9.75	110	8.86	9.59	108	(75-125)	1.60	(< 20)
Ethylbenzene	8.86	9.81	111	8.86	9.69	109	(75-125)	1.30	(< 20)
o-Xylene	8.86	9.45	107	8.86	9.37	106	(75-125)	0.87	(< 20)
P & M -Xylene	17.7	19.5	110	17.7	19.3	109	(80-125)	0.98	(< 20)
Toluene	8.86	9.72	110	8.86	9.59	108	(70-125)	1.30	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	8.86	88.8	89	8.86	89	89	(72-119)	0.25	

Batch Information

Analytical Batch: **VFC12847**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **CRD**

Prep Batch: **VXX28343**
Prep Method: **SW5035A**
Prep Date/Time: **12/09/2015 08:00**
Spike Init Wt./Vol.: 8.86 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 8.86 ug/Kg Extract Vol: 25 mL

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Matrix Spike Summary

Original Sample ID: 1156988005
MS Sample ID: 1306927 MS
MSD Sample ID: 1306928 MSD

Analysis Date: 12/09/2015 12:24
Analysis Date: 12/09/2015 12:43
Analysis Date: 12/09/2015 13:02
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988004, 1156988005

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Benzene	8.85U	625	690	109	625	680	108	75-125	1.50	(< 20)
Ethylbenzene	17.9	625	705	110	625	692	108	75-125	1.90	(< 20)
o-Xylene	17.7U	625	680	106	625	663	104	75-125	2.30	(< 20)
P & M -Xylene	81.4	1247	1435	108	1247	1402	106	80-125	2.10	(< 20)
Toluene	51.7	625	717	107	625	704	105	70-125	1.80	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		625	563	90	625	541	87	72-119	4.10	

Batch Information

Analytical Batch: VFC12847
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: CRD
Analytical Date/Time: 12/9/2015 12:43:00PM

Prep Batch: VXX28343
Prep Method: AK101 Extraction (S)
Prep Date/Time: 12/9/2015 8:00:00AM
Prep Initial Wt./Vol.: 110.52g
Prep Extract Vol: 25.00mL

Print Date: 12/16/2015 12:19:50PM

Method Blank

Blank ID: MB for HBN 1726168 [VXX/28347]
Blank Lab ID: 1307194

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988007

Results by **SW8021B**

Parameter	Results	LOQ/CL	DL	Units
Ethylbenzene	12.5U	25.0	7.80	ug/Kg
o-Xylene	12.5U	25.0	7.80	ug/Kg
P & M -Xylene	16.8J	50.0	15.0	ug/Kg
Surrogates				
1,4-Difluorobenzene (surr)	84.3	72-119		%

Batch Information

Analytical Batch: VFC12848
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/10/2015 5:59:00PM

Prep Batch: VXX28347
Prep Method: SW5035A
Prep Date/Time: 12/10/2015 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL

Print Date: 12/16/2015 12:19:51PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [VXX28347]
Blank Spike Lab ID: 1307195
Date Analyzed: 12/10/2015 18:17

Spike Duplicate ID: LCSD for HBN 1156988 [VXX28347]
Spike Duplicate Lab ID: 1307196
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988007

Results by **SW8021B**

	Blank Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Ethylbenzene	1250	1420	114	1250	1350	108	(75-125)	5.10	(< 20)
o-Xylene	1250	1360	109	1250	1300	104	(75-125)	4.80	(< 20)
P & M -Xylene	2500	2810	113	2500	2670	107	(80-125)	5.20	(< 20)
Surrogates									
1,4-Difluorobenzene (surr)	1250	88.7	89	1250	90.3	90	(72-119)	1.80	

Batch Information

Analytical Batch: **VFC12848**
Analytical Method: **SW8021B**
Instrument: **Agilent 7890A PID/FID**
Analyst: **S.P**

Prep Batch: **VXX28347**
Prep Method: **SW5035A**
Prep Date/Time: **12/10/2015 08:00**
Spike Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1250 ug/Kg Extract Vol: 25 mL

Matrix Spike Summary

Original Sample ID: 1156988007
MS Sample ID: 1307197 MS
MSD Sample ID: 1307198 MSD

QC for Samples: 1156988007

Analysis Date: 12/10/2015 19:52
Analysis Date: 12/10/2015 20:10
Analysis Date: 12/10/2015 20:29
Matrix: Soil/Solid (dry weight)

Results by **SW8021B**

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Ethylbenzene	174	592	750	97	592	746	97	75-125	0.47	(< 20)
o-Xylene	48.0	592	688	108	592	713	112	75-125	3.70	(< 20)
P & M -Xylene	103	1189	1429	112	1189	1440	113	80-125	0.46	(< 20)
Surrogates										
1,4-Difluorobenzene (surr)		592	587	99	592	585	99	72-119	0.34	

Batch Information

Analytical Batch: VFC12848
Analytical Method: SW8021B
Instrument: Agilent 7890A PID/FID
Analyst: S.P
Analytical Date/Time: 12/10/2015 8:10:00PM

Prep Batch: VXX28347
Prep Method: AK101 Extraction (S)
Prep Date/Time: 12/10/2015 8:00:00AM
Prep Initial Wt./Vol.: 120.74g
Prep Extract Vol: 25.00mL

Print Date: 12/16/2015 12:19:52PM

Method Blank

Blank ID: MB for HBN 1725885 [XXX/34711]
Blank Lab ID: 1306375

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988001, 1156988002, 1156988003, 1156988004, 1156988005, 1156988006, 1156988007, 1156988008, 1156988009

Results by **AK102**

Parameter	Results	LOQ/CL	DL	Units
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane (surr)	85.9	60-120		%

Batch Information

Analytical Batch: XFC12221
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: NLL
Analytical Date/Time: 12/7/2015 8:21:00PM

Prep Batch: XXX34711
Prep Method: SW3550C
Prep Date/Time: 12/4/2015 10:24:08AM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [XXX34711]
Blank Spike Lab ID: 1306376
Date Analyzed: 12/07/2015 20:31

Spike Duplicate ID: LCSD for HBN 1156988 [XXX34711]
Spike Duplicate Lab ID: 1306377
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988001, 1156988002, 1156988003, 1156988004, 1156988005, 1156988006, 1156988007, 1156988008, 1156988009

Results by **AK102**

	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)					
Parameter	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Diesel Range Organics	167	146	88	167	151	91	(75-125)	3.20	(< 20)
Surrogates									
5a Androstane (surr)	3.33	95.9	96	3.33	100	100	(60-120)	4.60	

Batch Information

Analytical Batch: **XFC12221**
Analytical Method: **AK102**
Instrument: **HP 6890 Series II FID SV D R**
Analyst: **NLL**

Prep Batch: **XXX34711**
Prep Method: **SW3550C**
Prep Date/Time: **12/04/2015 10:24**
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

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Method Blank

Blank ID: MB for HBN 1726027 [XXX/34719]
Blank Lab ID: 1306668

Matrix: Soil/Solid (dry weight)

QC for Samples:
1156988004

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

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	2.50U	5.00	1.50	ug/Kg
2-Methylnaphthalene	1.98J	5.00	1.50	ug/Kg
Acenaphthene	2.50U	5.00	1.50	ug/Kg
Acenaphthylene	2.50U	5.00	1.50	ug/Kg
Anthracene	2.50U	5.00	1.50	ug/Kg
Benzo(a)Anthracene	2.50U	5.00	1.50	ug/Kg
Benzo[a]pyrene	2.50U	5.00	1.50	ug/Kg
Benzo[b]Fluoranthene	2.50U	5.00	1.50	ug/Kg
Benzo[g,h,i]perylene	2.50U	5.00	1.50	ug/Kg
Benzo[k]fluoranthene	2.50U	5.00	1.50	ug/Kg
Chrysene	2.50U	5.00	1.50	ug/Kg
Dibenzo[a,h]anthracene	2.50U	5.00	1.50	ug/Kg
Fluoranthene	2.50U	5.00	1.50	ug/Kg
Fluorene	2.50U	5.00	1.50	ug/Kg
Indeno[1,2,3-c,d] pyrene	2.50U	5.00	1.50	ug/Kg
Naphthalene	2.50U	5.00	1.50	ug/Kg
Phenanthrene	2.50U	5.00	1.50	ug/Kg
Pyrene	2.50U	5.00	1.50	ug/Kg
Surrogates				
2-Fluorobiphenyl (surr)	66.8	46-115		%
Terphenyl-d14 (surr)	103	58-133		%

Batch Information

Analytical Batch: XMS9114
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: MCM
Analytical Date/Time: 12/9/2015 9:25:00PM

Prep Batch: XXX34719
Prep Method: SW3550C
Prep Date/Time: 12/8/2015 10:37:11AM
Prep Initial Wt./Vol.: 22.5 g
Prep Extract Vol: 1 mL

Print Date: 12/16/2015 12:19:57PM

Blank Spike Summary

Blank Spike ID: LCS for HBN 1156988 [XXX34719]
Blank Spike Lab ID: 1306669
Date Analyzed: 12/09/2015 21:39

Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988004

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

Blank Spike (ug/Kg)

Parameter	Spike	Result	Rec (%)	CL
1-Methylnaphthalene	22.2	18.3	82	(43-111)
2-Methylnaphthalene	22.2	18.7	84	(39-114)
Acenaphthene	22.2	15.9	72	(44-111)
Acenaphthylene	22.2	15.9	71	(39-116)
Anthracene	22.2	17.2	77	(50-114)
Benzo(a)Anthracene	22.2	19.9	90	(54-122)
Benzo[a]pyrene	22.2	15.9	72	(50-125)
Benzo[b]Fluoranthene	22.2	18.7	84	(53-128)
Benzo[g,h,i]perylene	22.2	18.7	84	(49-127)
Benzo[k]fluoranthene	22.2	19.1	86	(56-123)
Chrysene	22.2	22.1	100	(57-118)
Dibenzo[a,h]anthracene	22.2	19.3	87	(50-129)
Fluoranthene	22.2	21.8	98	(55-119)
Fluorene	22.2	17.6	79	(47-114)
Indeno[1,2,3-c,d] pyrene	22.2	18.7	84	(49-130)
Naphthalene	22.2	16.9	76	(38-111)
Phenanthrene	22.2	19.7	89	(49-113)
Pyrene	22.2	23.1	104	(55-117)
Surrogates				
2-Fluorobiphenyl (surr)	22.2	75.7	76	(46-115)
Terphenyl-d14 (surr)	22.2	104	104	(58-133)

Batch Information

Analytical Batch: **XMS9114**
Analytical Method: **8270D SIMS (PAH)**
Instrument: **HP 6890/5973 MS SVQA**
Analyst: **MCM**

Prep Batch: **XXX34719**
Prep Method: **SW3550C**
Prep Date/Time: **12/08/2015 10:37**
Spike Init Wt./Vol.: 22.2 ug/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: Extract Vol:

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Matrix Spike Summary

Original Sample ID: 1156988004
MS Sample ID: 1306670 MS
MSD Sample ID: 1306671 MSD

Analysis Date: 12/09/2015 21:53
Analysis Date: 12/09/2015 22:08
Analysis Date: 12/09/2015 22:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1156988004

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

		Matrix Spike (ug/Kg)			Spike Duplicate (ug/Kg)					
Parameter	Sample	Spike	Result	Rec (%)	Spike	Result	Rec (%)	CL	RPD (%)	RPD CL
Acenaphthene	36.5	24.4	53.1	68	24.3	49.8	55	44-111	6.50	(< 20)
Acenaphthylene	5.43U	24.4	34.0	139 *	24.3	32.3	133 *	39-116	4.70	(< 20)
Anthracene	5.43U	24.4	22.3	92	24.3	22.1	91	50-114	1.40	(< 20)
Benzo(a)Anthracene	5.43U	24.4	24.5	100	24.3	24.1	99	54-122	1.70	(< 20)
Benzo[a]pyrene	5.43U	24.4	20.9	86	24.3	21.1	87	50-125	0.64	(< 20)
Benzo[b]Fluoranthene	5.43U	24.4	19.7	80	24.3	20.7	85	53-128	5.20	(< 20)
Benzo[g,h,i]perylene	5.43U	24.4	20.7	85	24.3	20.6	85	49-127	0.65	(< 20)
Benzo[k]fluoranthene	5.43U	24.4	18.0	74	24.3	19.8	81	56-123	9.30	(< 20)
Chrysene	5.43U	24.4	26.0	106	24.3	26.2	108	57-118	1.10	(< 20)
Dibenzo[a,h]anthracene	5.43U	24.4	19.0	78	24.3	19.0	78	50-129	0.04	(< 20)
Fluoranthene	9.94	24.4	31.4	88	24.3	30.6	85	55-119	2.60	(< 20)
Fluorene	30.3	24.4	46.4	66	24.3	44.6	59	47-114	4.30	(< 20)
Indeno[1,2,3-c,d] pyrene	5.43U	24.4	18.8	77	24.3	18.8	77	49-130	0.08	(< 20)
Phenanthrene	37.7	24.4	53.6	65	24.3	51.6	57	49-113	3.70	(< 20)
Pyrene	15.2	24.4	37.4	91	24.3	36.3	87	55-117	2.90	(< 20)
1-Methylnaphthalene	4860	24.4	4664	-806 *	24.3	4257	-2490 *	43-111	9.20	(< 20)
2-Methylnaphthalene	7340	24.4	7074	-1080 *	24.3	6359	-4010 *	39-114	10.60	(< 20)
Naphthalene	2150	24.4	2068	-315 *	24.3	1837	-1280 *	38-111	12.10	(< 20)
Surrogates										
2-Fluorobiphenyl (surr)		24.4	18.0	74	24.3	17.7	73	46-115	2.20	
Terphenyl-d14 (surr)		24.4	24.5	100	24.3	24.4	100	58-133	0.38	

Batch Information

Analytical Batch: XMS9114
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: MCM
Analytical Date/Time: 12/9/2015 10:08:00PM

Prep Batch: XXX34719
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 12/8/2015 10:37:11AM
Prep Initial Wt./Vol.: 22.51g
Prep Extract Vol: 1.00mL

Analytical Batch: XMS9117
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890/5973 MS SVQA
Analyst: NRB
Analytical Date/Time: 12/11/2015 10:21:00PM

Prep Batch: XXX34719
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 12/8/2015 10:37:11AM
Prep Initial Wt./Vol.: 22.51g
Prep Extract Vol: 1.00mL

Print Date: 12/16/2015 12:20:00PM

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1156988

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

Page 1 of 1

Section 1

CLIENT: BGES

CONTACT: Jayne PHONE NO: 644-2900

PROJECT NAME: Hannah Muldoon PROJECT/ PWSID/ PERMIT#: /

REPORTS TO: Jayne E-MAIL: Jayne@bgesinc.com

INVOICE TO: Jayne QUOTE #: 12658 P.O. #: -

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incremental Soils	Preservative: MeOH / GRO AK101	4°±2°C / DRO AK102	MeOH / BTEX 8021B	4°±2°C / PAH 8270	REMARKS/ LOC ID
(1) A-B	SB2B-7-1202	12/2/15	1637	Soil	2	G	X	X	X		
(2) A-B	SB3B-7-1202		1136				X	X	X		
(3) A-B	SB6B-6-1202		1040				X	X	X		
(4) A-B	SB7C-5-1202		1543				X	X	X	X	
(5) A-B	SB9B-7-1202		1730				X	X	X		
(6) A-B	SB9B-8-1202		1730				X	X	X		
(7) A-B	SB11B-8-1202		1229				X	X	X		
(8) A-B	SB11C-3-1202		1326				X	X	X		
(9) A-B	SB11C-6-1202		1358				X	X	X		
(10) A	Trip Blank	-	-		1	-	X		X		

Section 5

	Date	Time	
Relinquished By: (1)	12/3/15	1409	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	12/3/15	1405	Received For Laboratory By:

Section 4

DOD Project? Yes (No)

Cooler ID:

Data Deliverable Requirements: Level 2

Requested Turnaround Time and/or Special Instructions:

10-day

Temp Blank °C: 4.2 #238

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle)

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

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

SGS

Returned Bottles Inventory

Name of individual returning bottles: Jayne

Date Received: 12/3/15

Client Name: BGES

Received by: EDT

Project Name: Hannah Muldoon

SGS PM: VLP

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

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

Amount to Invoice Client $: 240

WO#: 6988

SGS

1156988

1156988

SAMPLE RECEIPT FORM

Review Criteria:	Yes	N/A	No	Comments/Action Taken:
Were **custody seals** intact? Note # & location, if applicable. COC accompanied samples?	☐ ☑	☑ ☐	☐ ☐	***Exemption permitted if sampler hand carries/delivers.***
Temperature blank compliant* (i.e., 0-6°C after CF)? *If >6°C, were samples collected <8 hours ago?* *If <0°C, were all sample containers ice free?* Cooler ID: [1] _____ @ 4.2 _____ w/ Therm.ID: 238 _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ 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."	☑ ☐ ☐	☐ ☑ ☑	☐ ☐ ☐	***Exemption permitted if chilled & collected <8 hrs ago.*** ***Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.***
Delivery method (specify all that apply): ☑Client (hand carried) ☐USPS ☐Lynden ☐AK Air ☐Alert Courier ☐UPS ☐FedEx ☐RAVN ☐C&D Delivery ☐Carlile ☐Pen Air ☐Warp Speed ☐Other: _____ → *For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?*	☐	☑	☐	
	Yes	**N/A**	**No**	
Were samples received within hold time? Do samples **match COC*** (i.e., sample IDs, dates/times collected)? Were analyses requested unambiguous?	☑ ☑ ☑	☐ ☐ ☐	☐ ☐ ☐	***Note: Refer to form F-083 "Sample Guide" for hold times.*** ***Note: If times differ <1hr, record details and login per COC.***
Were samples in **good condition** (no leaks/cracks/breakage)? Packing material used (specify all that apply): ☐Bubble Wrap ☐Separate plastic bags ☐Vermiculite ☐Other:	☑	☐	☐	
Were **proper containers** (type/mass/volume/preservative*) used? Were **Trip Blanks** (i.e., VOAs, LL-Hg) in cooler with samples? Were all VOA vials **free of headspace** (i.e., bubbles ≤6 mm)? Were all soil VOAs **field extracted** with MeOH+BFB?	☑ ☐ ☐ ☐	☐ ☑ ☑ ☑	☐ ☐ ☐ ☐	☐ ***Exemption permitted for metals (e.g., 200.8/6020A).***
For preserved waters (other than VOA vials, LL-Mercury or microbiological analyses), was **pH verified and compliant**? If pH was adjusted, were bottles flagged (i.e., stickers)?	☐ ☐	☑ ☑	☐ ☐	
For **special handling** (e.g., "MI" soils, foreign soils, lab filter for dissolved…, lab extract for volatiles, Ref Lab, limited volume), were bottles/paperwork flagged (e.g., sticker)?	☐	☑	☐	
For **RUSH/SHORT Hold Time**, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	☐	☑	☐	
For **SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP**, were containers / paperwork flagged accordingly?	☐	☑	☐	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	☐	☑	☐	SRF Completed by: EDJ PM notified:
Was **PEER REVIEW** of ***sample numbering/labeling completed?***	☑	☐	☐	Peer Reviewed by: VLP
Additional notes (if applicable):				

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

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1156988001-A	No Preservative Required	OK			
1156988001-B	Methanol field pres. 4 C	OK			
1156988002-A	No Preservative Required	OK			
1156988002-B	Methanol field pres. 4 C	OK			
1156988003-A	No Preservative Required	OK			
1156988003-B	Methanol field pres. 4 C	OK			
1156988004-A	No Preservative Required	OK			
1156988004-B	Methanol field pres. 4 C	OK			
1156988005-A	No Preservative Required	OK			
1156988005-B	Methanol field pres. 4 C	OK			
1156988006-A	No Preservative Required	OK			
1156988006-B	Methanol field pres. 4 C	OK			
1156988007-A	No Preservative Required	OK			
1156988007-B	Methanol field pres. 4 C	OK			
1156988008-A	No Preservative Required	OK			
1156988008-B	Methanol field pres. 4 C	OK			
1156988009-A	No Preservative Required	OK			
1156988009-B	Methanol field pres. 4 C	OK			
1156988010-A	Methanol field pres. 4 C	OK			

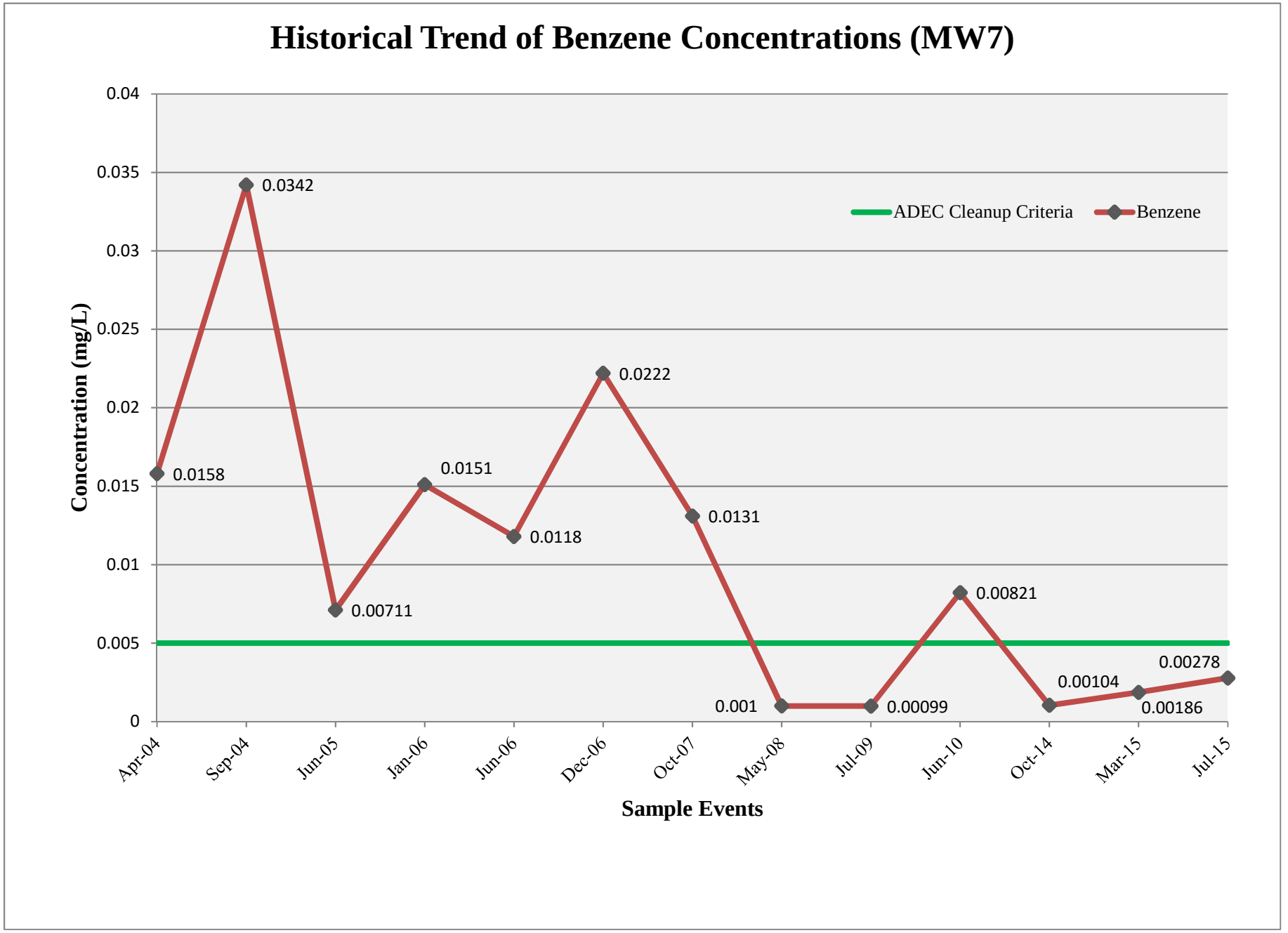
Container Condition Glossary

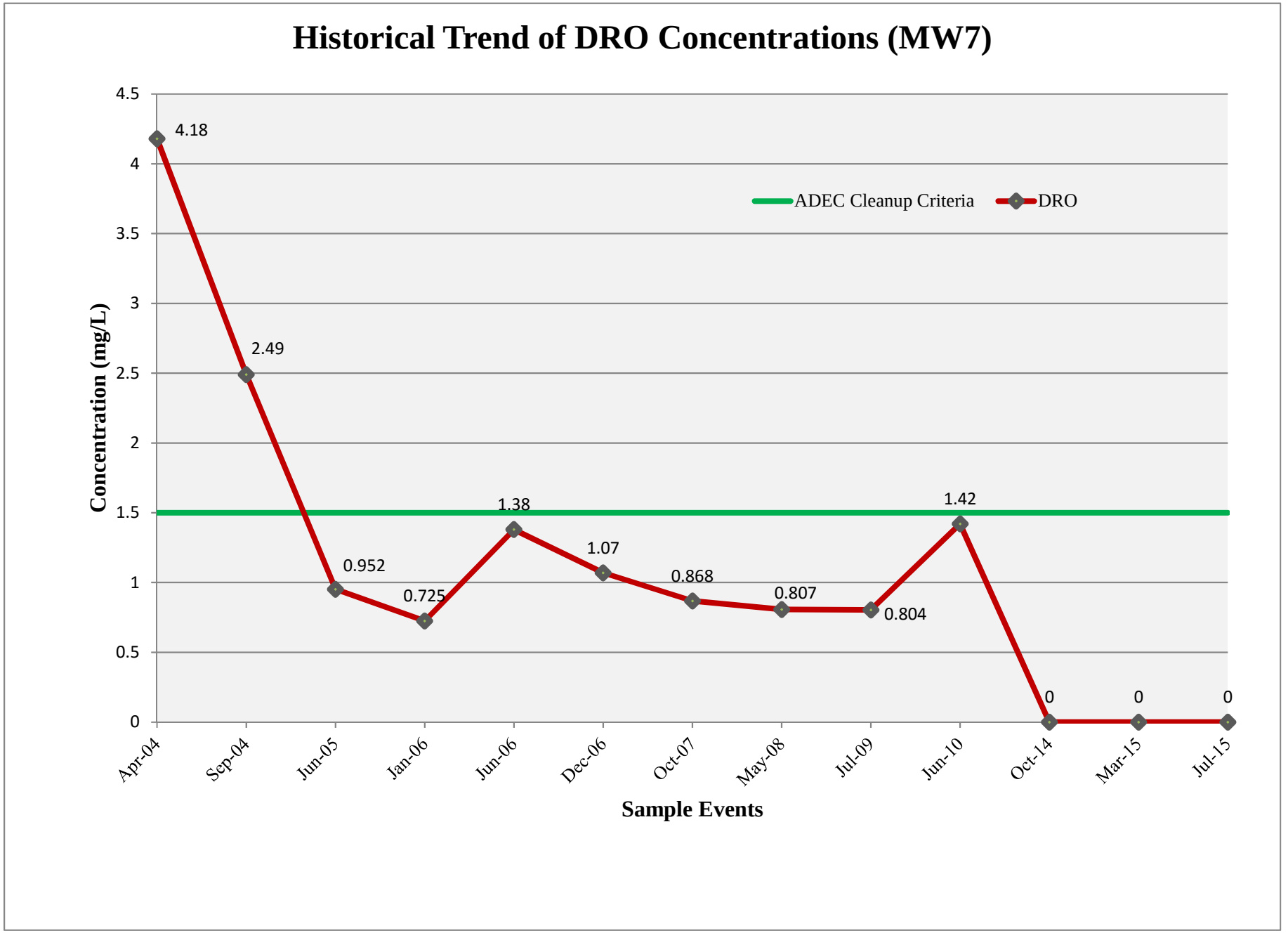
Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

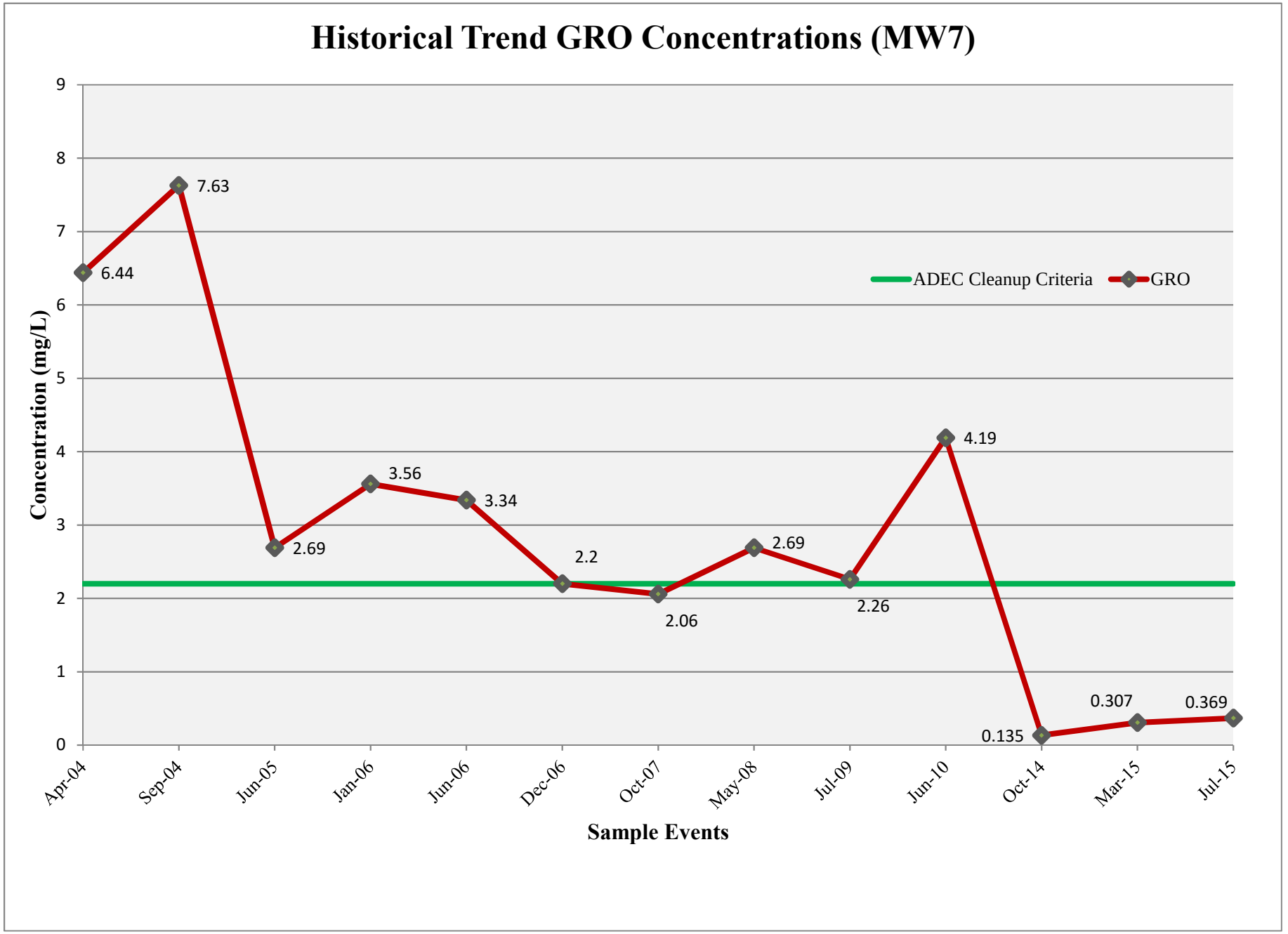
OK - The container was received at an acceptable pH for the analysis requested.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
BU - The container was received with headspace greater than 6mm.

APPENDIX E

GRAPHS OF HISTORICAL CONTAMINANT CONCENTRATIONS IN MW7


Historical Trend of Benzene Concentrations (MW7)
Concentration (mg/L)
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
ADEC Cleanup Criteria
Benzene
0.0158
0.0342
0.00711
0.0151
0.0118
0.0222
0.0131
0.001
0.00099
0.00821
0.00104
0.00186
0.00278
Apr-04
Sep-04
Jun-05
Jan-06
Jun-06
Dec-06
Oct-07
May-08
Jul-09
Jun-10
Oct-14
Mar-15
Jul-15
Sample Events


Historical Trend of DRO Concentrations (MW7)
Concentration (mg/L)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
ADEC Cleanup Criteria
DRO
4.18
2.49
0.952
0.725
1.38
1.07
0.868
0.807
0.804
1.42
0
0
0
Apr-04
Sep-04
Jun-05
Jan-06
Jun-06
Dec-06
Oct-07
May-08
Jul-09
Jun-10
Oct-14
Mar-15
Jul-15
Sample Events


Historical Trend GRO Concentrations (MW7)
Concentration (mg/L)
Sample Events
ADEC Cleanup Criteria
GRO
9
8
7
6
5
4
3
2
1
0
6.44
7.63
2.69
3.56
3.34
2.2
2.06
2.69
2.26
4.19
0.135
0.307
0.369
Apr-04
Sep-04
Jun-05
Jan-06
Jun-06
Dec-06
Oct-07
May-08
Jul-09
Jun-10
Oct-14
Mar-15
Jul-15

APPENDIX F
LABORATORY DATA REVIEW CHECKLISTS

Laboratory Data Review Checklist

Completed by: Kris Shippen

Title: Environmental Scientist I Date: January 15, 2016

CS Report Name: Groundwater Monitoring and Soil Sampling Report Report Date: February 2015

Consultant Firm: BGES, Inc.

Laboratory Name: SGS North America, Inc., Alaska Division Laboratory Report Number: 1153337

ADEC File Number: 2100.26.204 ADEC Hazard ID: 23821

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform 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?
      Yes No (NA) (Please explain.) Comments:

   Samples were not transferred to a network laboratory.

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

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

3. Laboratory Sample Receipt Documentation

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

   The temperature of the sample cooler that contained the water samples was measured at the laboratory at the time of receipt to be 3.5 degrees Celsius (C). The temperature in the cooler was within the prescribed optimal temperature range of 4 degrees Celsius +/- 2 degrees.

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

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

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

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

No irregularities or abnormalities with respect to sample containers were reported.

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

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

Samples MW7-0701 and MW9-0701 had their labeles inadvertently transposed. This was corrected, by K. Shippen, at the Laboratory, prior to the performance of analyses.

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

Comments:

No

4. Case Narrative

a. Present and understandable?

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

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

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

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

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

No discrepancies, errors, or QC failures identified by the lab.

Comments:

5. Samples Results

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

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

b. All applicable holding times met?

(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 the minimum required detection level for the project?

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

e. Data quality or usability affected?

N/A

6. QC Samples

a. Method Blank

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

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

ii. All method blank results less than PQL?

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

iii. If above PQL, what samples are affected?

Comments:

N/A

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

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

N/A

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

Comments:

N/A

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

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

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

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

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

Analysis for metals was not part of the approved scope of work for this portion of the project.

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

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

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

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

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

Comments:

N/A

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

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

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

Comments:

N/A

c. Surrogates – Organics Only

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

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

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

Samples do not have failed surrogate recoveries.

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

N/A

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

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

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

All soil samples for volatiles analysis were transported in the same cooler.

iii. All results less than PQL?
(Yes) No NA (Please explain.) Comments:

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

N/A

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

Comments:

N/A

e. Field Duplicate

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

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

A field duplicate was inadvertently not collected at the time of sampling activities.

ii. Submitted blind to lab?

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

See 6. e. i. above

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

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

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

See 6. e. i. above

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

Comments:

N/A

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

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

Not applicable. A decontamination or equipment blank was not collected; not part of our approved scope of work.

i. All results less than PQL?

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

Not applicable. A decontamination or equipment blank was not collected; not part of our approved scope of work.

ii. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)
   a. Defined and appropriate?
      Yes No (NA) (Please explain.) Comments:

Not applicable for this project.

Laboratory Data Review Checklist

Completed by: Kris Shippen

Title: Environmental Scientist I Date: January 18, 2016

CS Report Name: Groundwater Monitoring and Soil Sampling Report Report Date: February 2015

Consultant Firm: BGES, Inc.

Laboratory Name: SGS North America, Inc., Alaska Division Laboratory Report Number: 1156988

ADEC File Number: 2100.26.204 ADEC Hazard ID: 23821

1. Laboratory
   a. Did an ADEC CS approved laboratory receive and perform 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?
      Yes No (NA) (Please explain.) Comments:

   Samples were not transferred to a network laboratory.

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

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

3. Laboratory Sample Receipt Documentation

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

   The temperature of the sample cooler that contained the water samples was measured at the laboratory at the time of receipt to be 4.2 degrees Celsius (C). The temperature in the cooler was within the prescribed optimal temperature range of 4 degrees Celsius +/- 2 degrees.

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

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

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

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

No irregularities or abnormalities with respect to sample containers were reported.

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

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

No irregularities were reported or observed.

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

Comments:

N/A

4. Case Narrative

a. Present and understandable?

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

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

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

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

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

The recoveries of the surrogate 4-bromofluorobenzene (BFB) in Laboratory Samples SB2B-7-1202, SB7C-5-1202, SB11B-8-1202, SB11C-3-1202, and SB11C-6-1202, related to the analysis of GRO within the samples, exceeded the laboratory's QC acceptance range (reportedly due to "matrix interference"). For this reason, the detectable concentration of GRO within Sample SB7C-5-1202 is qualified "J", and should be considered an estimate. Because of this, the reported concentrations of GRO within these samples are potentially biased high. While it is possible the reported concentration of GRO within Sample SB7C-5-1202 may exceed the applicable ADEC cleanup criterion due to this potential bias, because the sample contains other analytes at concentrations that significantly exceed their respective cleanup criteria, it is our opinion that the data are acceptable for their intended use. Because the remaining samples listed above did not exhibit concentrations of GRO in excess of the ADEC cleanup criterion, it is our opinion that this data QC failure does not affect the acceptability of the data for their intended use.

The recovery of several spiked PAH compounds within the matrix spike (MS) and matrix spike duplicate (MSD) , derived from parent sample SB7C-5-1202 did not meet the laboratory's QC criteria. The recovery of Acenaphthylene was above the laboratory's QC criteria, indicating that the reported concentration of this analyte may be biased high within the parent sample; however because this analyte was not detected above the laboratory's LOQ for this analysis, and the LOQ did not exceed the applicable ADEC cleanup criterion, it is our opinion that this data QC failure does not affect the datum for its intended use. The recoveries of 1-Methylnaphthalene, 2-Methylnaphthalene, and Naphthalene were below the laboratory's QC criteria, indicating that the reported concentrations of these analytes within the parent sample may be biased low. Because the reported concentration of 2-Methylnaphthalene was above the applicable ADEC cleanup criterion for this analyte, it is our opinion that this data QC error does not affect the usability of the datum for its intended use. Because the reported concentration of Naphthalene within the parent sample was one order of magnitude below the applicable ADEC cleanup criterion, it is our opinion that this data QC error does not affect the usability of the datum for its intended use. Because the reported concentration of 1-Methylnaphthalene within the parent sample was less than one order of magnitude below the applicable ADEC cleanup criterion for this analyte, it is our opinion that this data QC error may affect the usability of the datum for its intended use. No other data QC errors were noted by the laboratory.

Comments:

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

   b. All applicable holding times met?
      (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 the minimum required detection level for the project?
      Yes (No) NA (Please explain.) Comments:

      The LOQs (PQLs) for benzene in samples SB7C-5-1202 and SB11B-8-1202 were above the applicable ADEC cleanup criterion for this analyte; however because the reported concentrations of benzene within these samples exceeded the ADEC cleanup criterion for this analyte, it is our opinion that this data QC error does not affect the usability of the data for their intended use.

   e. Data quality or usability affected?
      No

6. QC Samples

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

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

      iii. If above PQL, what samples are affected?

Comments:

iv. Do the affected sample(s) have data flags and if so, are the data flags clearly defined?
Yes No (NA) (Please explain.) Comments:

N/A

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

N/A

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)
(Yes) No NA (Please explain.) Comments:

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
Yes No (NA) (Please explain.) Comments:

Analysis for metals was not part of the approved scope of work for this project.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)
(Yes) No NA (Please explain.) Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)
(Yes) No NA (Please explain.) Comments:

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

N/A

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
Yes No (NA) (Please explain.) Comments:

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

N/A

c. Surrogates – Organics Only

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

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

See 4 b above

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

See 4 b above

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

See 4 b above

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

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

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

All soil samples for volatiles analysis were transported in the same cooler.

iii. All results less than PQL?

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

iv. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

e. Field Duplicate

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

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

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: $\frac{(R_1-R_2)}{((R_1+R_2)/2)} \times 100$

Where R_1 = Sample Concentration
R_2 = Field Duplicate Concentration

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

Soil Sample SB9B-8-1202 was a duplicate of Soil Sample SB9B-7-1202 and was collected to evaluate sampling precision. The RPDs could not be calculated for GRO or DRO, because these analytes were not detected in either sample; the RPD could not be calculated for benzene because this anlyte was not detected in sample SB9B-7-1202. The RPDs for toluene, ethylbenzene, and total xylenes were less than the acceptable limit of 50 percent, and ranged from 6 to 24 percent. This indicates excellent sampling precision for this soil sampling event.

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

Comments:

N/A

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

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

Not applicable. A decontamination or equipment blank was not collected; not part of our approved scope of work.

i. All results less than PQL?

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

Not applicable. A decontamination or equipment blank was not collected; not part of our approved scope of work.

ii. If above PQL, what samples are affected?

Comments:

N/A

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

Comments:

N/A

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

a. Defined and appropriate?

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

Not applicable for this project.