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Chugiak, Alaska**

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ACRONYMS AND ABBREVIATIONS

%.....	percent
AAC.....	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
bgs.....	below ground surface
BTEX.....	benzene, toluene, ethylbenzene and xylene
°C.....	degrees Celsius
COPC.....	contaminant of potential concern
CSM	conceptual site model
Discovery	Discovery Drilling, Inc.
DL	detection limit
DQO.....	data quality objectives
DRO	diesel range organics
EMI	Environmental Management, Inc.
ERM	ERM Alaska, Inc.
GRO	gasoline range organics
LCS/LCSD.....	laboratory control sample/laboratory control sample duplicate
MOA.....	Municipality of Anchorage
MS/MSD.....	matrix spike/matrix spike duplicate
PAH.....	polynuclear aromatic hydrocarbons
PPE.....	personal protective equipment
QA.....	quality assurance
QC.....	quality control
RL.....	reporting limit
RPD.....	relative percent difference
SDG.....	sample delivery group
SGS.....	SGS North America, Inc.
SIM.....	selective ion monitoring
USEPA.....	U.S. Environmental Protection Agency
UST	underground storage tank

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1. INTRODUCTION

ERM Alaska, Inc. (ERM) is submitting this report to Berkley Specialty Underwriting Managers presenting the findings of the environmental site investigation conducted at the former Circle S Grocery located at 22189 Birchwood Loop Road, Chugiak, Alaska (Figure 1), Alaska Department of Environmental Conservation (ADEC) File Number 2106.26.004, Hazard ID 24797. The current property owner is Ms. Pomposa Porterfield. The building and property are currently occupied by a secondhand store, Priceless Treasures. Field work for this project was performed on 14 and 15 January 2014.

This report summarizes the site investigation activities (Section 2); site observations (Section 3); investigation results (Section 4); quality assurance review (QAR; Section 5); conclusions and recommendations (Section 6); and references (Section 7).

1.1. Site Background

Chugiak is located in south-central Alaska, approximately 20 miles north of Anchorage, as shown in Figure 1. Chugiak is part of the Municipality of Anchorage (MOA), located between the communities of Eagle River and Peters Creek.

Circle S Grocery previously operated a gas station and a small convenience store at the site (Figure 2). In June 1995, two underground storage tanks (UST), a 10,000-gallon gasoline UST and a 5,000-gallon diesel UST, were removed from the site. The soil beneath the USTs was impacted with fuel and some of the impacted soil was excavated at the time of the UST removals. According to the 1995 *UST Permanent Closure Site Assessment Report* (New Horizons Telecom, Inc. 1995), not all of the impacted soil was excavated, and the excavation area was lined with a fuel resistant liner before the installation of a replacement UST. The closure report stated that the 5,000-gallon diesel UST was used to store gasoline until 1994, when the product was switched to diesel. These tanks were replaced by an 11,000-gallon dual compartment tank in 1995, which held both gasoline and diesel fuel for the gas station's fuel sales until the store's closing. In August 2012, the dual compartment UST was removed (reported as 15,000 gallons in the UST removal report; Environmental Management, Inc. [EMI] 2012).

Soil sampling was performed during the 1995 and 2012 UST removal actions, and a limited site investigation was conducted in 1999 to characterize fuel releases from the USTs. The reports documenting these activities indicate that petroleum hydrocarbons remain in the soil at the site at concentrations that exceed the State of Alaska cleanup levels. In June 2013, the ADEC sent a letter to Ms. Porterfield, which outlined the State of Alaska regulations concerning contaminated sites and responsibilities as a landowner (ADEC 2013a). The letter requested that a work plan be developed to define the nature and extent of the remaining contamination, and submitted to the ADEC.

Soils in the immediate vicinity of the UST were reportedly mostly pea gravel (EMI 2012). The soils surrounding the pea gravel consisted of brown sandy silt with gravel. No groundwater was encountered during either the 1995 or the 2012 UST removal actions.

Groundwater levels are reported to be greater than 70 feet below ground surface (bgs) in the Chugiak, Alaska area.

1.2. Previous Investigations

In 1995, the USTs were emptied of fuel before removal (New Horizons Telecom, Inc. 1995). The final excavation measured 22 feet by 37 feet by 16 feet deep. Fuel-contaminated soil was encountered throughout the excavation to a depth of 15 feet bgs. Field screening performed during tank removal indicated high levels of petroleum contamination (New Horizons Telecom, Inc. 1995). Laboratory analysis of soil samples collected from the bottom of the excavation indicated that remaining soil was impacted above applicable ADEC-cleanup levels for petroleum hydrocarbons. A fuel resistant liner was placed in the excavation prior to the installation of a new UST and clean backfill.

In August 1999, a limited site investigation was conducted to characterize the extent of petroleum hydrocarbon impacts to the subsurface at the site (TELLUS Ltd. 1999a). Two soil boreholes were advanced to approximately 67 feet bgs. Laboratory results of soil samples collected from the boreholes indicated that benzene and gasoline-range organics (GRO) concentrations exceeded the ADEC soil cleanup levels found in *Title 18 of the Alaska Administrative Code (AAC), Chapter 75 (18 AAC 75), Oil and Other Hazardous Substances Pollution Control* (ADEC 2012). Although no groundwater was encountered in the boreholes, groundwater monitoring wells were installed. The monitoring wells were checked in September 1999 and no groundwater was detected in the wells (TELLUS Ltd. 1999b).

In August 2012, the dual compartment UST was removed. The excavation conducted to remove the UST did not extend past the liner placed in 1995, when the tank was installed. Laboratory results for soil samples collected from the excavation bottom indicated that benzene and diesel-range organics (DRO) exceeded the ADEC 18 AAC 75 soil cleanup levels (EMI 2012). Soil removed from the excavation was stockpiled and sampled. Review of results for the soil stockpile samples indicated that this soil was not impacted above the ADEC soil cleanup levels. The closure report did not state what material was used to backfill the excavation.

1.3. Project Objective

The primary objective of this project was to delineate the extent of soil contamination remaining at the property caused by the UST removed in 2012. Given the history of the site and that contamination from the USTs removed in 1995 apparently remains, it is likely that the contaminant plumes from the USTs are comingled. In addition, the letter from the ADEC (ADEC 2013a) requested that the remaining contamination at the property be characterized. Therefore, the scope of work included investigation below the likely extent of the 2012 UST contaminant plume to obtain data that may distinguish between the two plumes.

1.4. Contaminants of Potential Concern

The contaminants of potential concern (COPC) at the site are volatile and semi-volatile petroleum hydrocarbons associated with gasoline and diesel fuel. As the original sources are gone, and a significant portion of the secondary source has also been removed, it is assumed that the contaminant concentrations present at the property are stable or decreasing.

1.5. Conceptual Site Model

The conceptual site model (CSM) for the site was developed by ERM during the project planning phase and updated using the results of this site investigation. The updated human health scoping form and graphical form are provided in Appendix A. The CSM conservatively assumes that there are completed exposure pathways between remaining contamination identified in site soils and future site receptors through incidental soil ingestion and inhalation of outdoor air. Additional assessment of the potential exposure pathways for current and future residents through ingestion, dermal absorption and inhalation of contaminants present in groundwater is needed to fully ascertain whether or not these pathways are complete. The CSM conservatively assumes that these groundwater exposure pathways are complete; however, given the depth to groundwater and the observed contaminant concentrations at depth, exposure is likely to be insignificant.

1.5.1. Source Area

The primary sources of the contamination at the site were fuel storage tanks, fuel dispenser islands, and associated piping, which have been removed. The secondary source is the contaminated soils at the site. Some of the contaminated soil was removed during the 1995 and 2012 UST removal actions; however, contaminated soil remained in place after both UST removals. The depth to the remaining contamination is approximately 14 feet bgs.

1.5.2. Geology/Hydrogeology

The site is located between Knik Arm and the Chugach Mountains. Soils at the site are either imported fill or consist of glacial till and outwash which were deposited during the Eklutna Glaciation (United States Geological Survey 1959). Groundwater was not encountered in boreholes advanced to depths of 67 feet bgs in 1999 (TELLUS Ltd. 1999a) or in the borehole advanced to a depth of 82 feet bgs during this investigation.

Four private drinking water wells were identified in the vicinity of the site, the nearest of which serves both the secondhand store at the site and the private residence of the site owner, Ms. Porterfield. The depth to the static water level in these wells is unknown. Groundwater flow direction is also unknown at this time, but is hypothesized to be toward the north/northeast, toward Peters Creek and Knik Arm, which coincides with the general ground slope in the area.

1.5.3. Buildings (Receptors)

One occupied building is located at the site and is currently in use as a secondhand store. There are several private residences and a church located in the vicinity of the site.

Site receptors include current and future residents, personnel who currently work at the secondhand store and who could potentially work at the site in the future, visitors to the site (both current and future), and any future construction worker conducting subsurface work at the site.

1.6. Regulatory Framework

The regulatory framework for this project was developed using the following regulations and guidance documents:

- 18 AAC 75, *Oil and Other Hazardous Substances Pollution Control* (ADEC 2012a).
- 18 AAC 78, *Underground Storage Tanks* (ADEC 2013b).
- *ADEC Policy Guidance on Developing Conceptual Site Models* (ADEC 2010b).
- *ADEC Site Characterization Work Plan and Reporting Guidance for Investigation of Contaminated Sites* (ADEC 2009b).

Soil samples collected as part of this investigation were submitted to the project laboratory for the analyses listed below.

- Benzene, toluene, ethylbenzene and xylenes (BTEX) by United States Environmental Protection Agency (USEPA) Method 8021B.
- GRO by Alaska Method AK101.
- DRO by Alaska Method AK102.

In addition, two of the samples (20 percent [%]) were analyzed for polynuclear aromatic hydrocarbons (PAH) using USEPA Method 8270 selective ion monitoring (SIM).

2. SITE INVESTIGATION ACTIVITIES AND METHODS

This section describes the site investigation activities completed at the former Circle S Grocery site. Two ERM employees, Mike Hauser and Sarah Christiansen, conducted the site investigation in accordance with the approved project work plan (ERM 2014). Both Mr. Hauser and Ms. Christiansen meet the definition of "qualified person" as per 18 AAC 75.990(100). Discovery Drilling, Inc. (Discovery) of Anchorage, Alaska performed the drilling activities for this project. SGS North America, Inc. (SGS) in Anchorage, Alaska, an ADEC-approved laboratory, provided analytical services for this project. Copies of the field notebook can be found in Appendix B. Photographs taken during the investigation are provided in Appendix C.

2.1. Pre-Investigation Activities

Before conducting the site investigation, ERM coordinated site access with Ms. Porterfield. ERM also notified the ADEC project manager (Mr. Robert Weimer) via email on 9 January 2014. Additional pre-investigation activities were performed as described in the subsections that follow.

2.1.1. *Utility Locates and Subsurface Clearance*

Before ground disturbance activities, ERM took precautions to prevent damage to subsurface utilities by strict adherence to our rigorous subsurface clearance process. Proposed borehole locations were reviewed with Ms. Porterfield prior to conducting any drilling work. A site walk was also conducted to visually survey the proposed borehole locations to identify signs of potential underground obstructions and utilities. Underground utilities in the vicinity of the proposed borehole locations were located using the Alaska DIGLINE public utility location service.

2.1.2. *Overhead Utility Clearance*

Overhead utilities are present at the site in the vicinity of the borehole locations. ERM confirmed overhead clearances with Discovery to ensure safe deployment of the drill rig to the borehole locations. Spotters were used to ensure safe distances while moving the drill rig and setting up the drill mast. A minimum distance of 10 feet between the energized lines and any part of the drill rig was maintained during drilling operations.

2.1.3. *Subcontractor Coordination*

Drilling was coordinated with Discovery and sample kits were obtained from SGS prior to commencing the investigation.

2.1.4. *Private Well Survey*

ERM confirmed the presence of drinking water wells at the residences and businesses in the immediate vicinity of the site. Where possible ERM obtained data regarding the

depth to static water level and the total well depth. ERM also noted the well's location relative to the site (i.e. north, south, east and west). The residences with private drinking water wells within the vicinity of the site are noted on Figure 2.

2.2. Borehole Installation

Three soil boreholes were advanced at the former Circle S Grocery site, centered on the approximate location of the former UST, within the 2012 excavation footprint (Figure 2). The two shallower boreholes, BH-2 and BH03, were both advanced to a depth of 26 feet bgs. Borehole BH01 was advanced to a depth of 82 feet bgs.

The boreholes were installed with a drill rig equipped with a hollow stem auger with solid auger flights. Samples were collected during borehole installation using a split-spoon sampler for the purposes of lithologic description, field screening and laboratory analysis. Borehole logs depicting the lithologic observations, sample intervals, field screening results and depths of analytical samples can be found in Appendix D.

2.3. Subsurface Soil Sampling

ERM supervised the advancement of soil boreholes. At each desired sampling depth, a split-spoon sampler was attached to the leading length of the drill rods and lowered to the bottom of the borehole. Split-spoon samples were collected for lithology identification and field screening using a photoionization detector (PID) as described in the paragraphs that follow.

Subsurface soil samples were collected continuously between 10 feet bgs and 22 feet bgs in the boreholes BH-2 and BH-3. One additional sample was collected between 22 feet bgs and 26 feet bgs in each of these boreholes. Soil samples were collected continuously between 10 feet bgs and 22 feet bgs in borehole BH-1, and then collected at 5-foot intervals until the borehole reached a depth of 30 feet bgs. Samples were then collected at 10-foot intervals thereafter. All samples were field screened with a PID and a lithologic soil classification was determined. PID readings were noted in the field notes and can be found in Table 1. The depths and locations of both field screening and analytical samples are also provided in Table 1.

Four subsurface soil samples were collected and submitted for laboratory analysis from borehole BH-1. One sample was collected from soils just above the liner (14-CGS-01-SS). Two samples were collected from depths exhibiting high field screening results (14-CGS-02-SS and 14-CGS-03-SS). The fourth sample was collected from the bottom of the borehole (14-CGS-04-SS). Sample depths and field screening results are presented in Table 1.

Three primary subsurface samples and one duplicate sample were collected and submitted for laboratory analysis from borehole BH-2. One sample was collected from soils above the liner (14-CGS-05-SS). Another sample was collected from soils below the liner (14-CGS-06-SS). The third sample and a duplicate sample were collected from the

bottom of the borehole (14-CGS-07-SS and 14-CGS-08-SS). Table 1 provides sample depths and field screening results for these samples.

Three primary samples were collected and submitted for laboratory analysis from borehole BH-3. One sample was collected from soils above the liner (14-CGS-09-SS). Another sample was collected from soils below the liner that exhibited high field screening results (14-CGS-10-SS). The third sample was collected from the bottom of the borehole (14-CGS-11-SS). Field screening results and sample depths for these samples are provided on Table 1.

2.4. Investigation-Derived Waste Management

Investigation-derived waste generated during this investigation included soil cuttings, decontamination water, and disposable sampling equipment and personal protective equipment (PPE).

Soil cuttings from the boreholes were used to backfill the boreholes upon completion, with cuttings being placed back into the hole they were removed from. Excess cuttings that could not be placed back into the boreholes were placed in a Super Sack® and stored on site pending receipt of analytical results. After analytical results were received, ERM compared the results to the thresholds established in the MOA's *Contaminated Soil, Spill Residue, Tanks and Associated Product Piping Disposal Policy* (MOA 2008) and determined that concentrations of GRO and total BTEX exceeded their applicable thresholds for disposal in the Anchorage Regional Landfill. ERM plans to seek approval from the ADEC to transport the soil cuttings to Alaska Soil Recycling in Anchorage, Alaska, for treatment and disposal.

Decontamination water was filtered through granular activated carbon and discharged to the ground at the site. Treated decontamination water was not discharged to the ground within 100 feet of any drinking water well or surface water body in the vicinity of the site.

Disposable sample equipment and PPE was collected in a garbage bag, taped shut and disposed of as solid waste in the Anchorage Regional Landfill.

2.5. Deviations from the Work Plan

Site conditions encountered during the investigation necessitated one deviation from the project work plan. Minor adjustments were made to the proposed borehole locations to allow for adequate subsurface and overhead utility clearance. Despite these adjustments, the boreholes were installed within the footprint of the former fuel dispenser island and with approximately the same spacing as proposed in the project work plan (ERM 2014).

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3. SITE INVESTIGATION RESULTS

The following subsections present the observations and results of the 2014 site investigation performed at the former Circle S Grocery.

3.1. Private Well Survey Findings

ERM performed a limited inspection of private drinking water wells in the vicinity of the former Circle S Grocery site during the field effort. It appears as though all residences and businesses in the immediate vicinity of the site use private wells. The approximate location of the well located at 22179 Birchwood Loop Road, the property owner's residence, is shown on Figure 2. The addresses of other residences and commercial properties in the vicinity of the site that have private drinking water wells are also shown on Figure 2.

The closest well to the site serves both the property owner's residence (22179 Birchwood Loop Road) and the secondhand store operating at the former Circle S Grocery. Ms. Porterfield could not provide the static water level or the total well depth for this well.

The Birchwood Christian School/Crossing Church (22208 Birchwood Loop Road) and two private residences across the street from the site (22186 Birchwood Loop Road and 22111 McKinley View Avenue) also use private wells. The owner of the residence at 22111 McKinley View Avenue (Mr. Steve Northcutt) stated that his well is approximately 150 feet deep. Mr. Northcutt was unable to provide the static water level for his well, or documentation of the well depth.

3.2. Site Geology

Gravel was present in all boreholes from surface depth to approximately 10 feet bgs. Soils below 15 feet bgs were predominantly Gravelly Sand, with some layers of Sandy Gravel and Silty Sand, which is typical of the glacial till and outwash present in this area of Alaska. Occasional cobble-sized rock units were encountered during borehole installation.

3.3. Field Observations

Damp soil was noted in all boreholes at depths of approximately 18 to 20 feet bgs; however, there was insufficient groundwater present to warrant well installation. Damp soil was also observed in borehole BH-1 intermittently at depths between 50 feet bgs and 70 feet bgs.

A petroleum odor was observed in borehole BH-1 at the following depth intervals: 16 feet bgs to 22 feet bgs, 50 feet bgs to 51.5 feet bgs, and 60 feet bgs to 62 feet bgs. Petroleum odor was observed in borehole BH-2 at the following depth intervals: 20 feet bgs to 22 feet bgs, and 25 feet bgs to 26 feet bgs. No observations of petroleum odor were recorded for borehole BH-3.

3.4. Analytical Results

Analytical results for soil samples were compared to the soil cleanup levels in 18 AAC 75, Tables B1 and B2, Migration to Groundwater pathway (ADEC 2012a). Table 2 presents a summary of analytical results, along with applicable soil cleanup levels. Concentration of detected analytes that exceeded their applicable ADEC soil cleanup levels are shown on Figure 3. The complete analytical report is provided in Appendix E.

Three of the 10 soil samples collected exceeded the ADEC Table B2 Method Two (ADEC 2012a) soil cleanup level for GRO. All GRO exceedances were in samples collected at depths below the liner; 18 to 20 feet bgs in BH-1, and 25 to 26 feet bgs in both BH-2 and BH-3. GRO were detected in all other soil samples submitted to the project laboratory for analyses as part of this investigation; however, none of the other detected GRO concentrations exceeded the ADEC soil cleanup level.

One soil sample collected from borehole BH-1 (14 to 16 feet bgs) exceeded the ADEC Table B2 Method Two soil cleanup level for DRO (ADEC 2012a). Subsequent samples collected in borehole BH-1 had DRO concentrations well below the cleanup level or were non-detect for DRO (80 to 82 feet bgs). DRO were detected in several other samples collected as part of this project; however, none of the other DRO concentrations exceeded the ADEC soil cleanup level.

Benzene, toluene and total xylenes were detected in all soil samples collected and submitted to the project laboratory for analyses. Ethylbenzene was detected in all samples with the exception of the sample collected from BH-2 at 18 to 20 feet bgs. Benzene concentrations exceeded the ADEC Table B1 Migration to Groundwater soil cleanup level (ADEC 2012a) in all samples collected from borehole BH-1, the sample collected at 25 to 26 feet bgs in borehole BH-2, and the samples collected from 16 to 18 feet bgs and 25 to 26 feet bgs in borehole BH-3. Toluene detections exceeded the ADEC Table B1 Method Two Migration to Groundwater soil cleanup level (ADEC 2012a) in three samples: BH-1 at 18 to 20 feet bgs and both BH-2 and BH-3 at 25 to 26 feet bgs. Ethylbenzene was detected at concentrations above the ADEC Table B1 Method Two Migration to Groundwater soil cleanup level (ADEC 2012a) in the same samples that toluene was detected above the cleanup level in. Exceedances of the ADEC Table B1 Method Two Migration to Groundwater soil cleanup level (ADEC 2012a) for total xylenes followed a similar pattern with the exception of the sample collected from borehole BH-2 at 25 to 26 feet bgs, which did not exceed the cleanup level.

The PAH compounds 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected at low concentrations in all soil samples submitted for PAH analysis. Fluorene and phenanthrene were detected in both the primary and duplicate samples collected from borehole BH-2 at 25 to 26 feet bgs. These detections did not exceed their applicable ADEC Table B1 Method Two soil cleanup levels.

3.5. Chromatogram Review

Chromatograms associated with samples analyzed for DRO (Alaska Method AK 102) were evaluated by an ERM senior chemist to identify the source of the contamination observed in the soil samples collected during this investigation. The chromatogram data review, as well as a review of the cross-section of the investigation area presented in Figure 4, determined that the DRO patterns in the samples collected from borehole BH-1 at 14 to 16 feet bgs and borehole BH-2 at 18 to 20 feet bgs (Figure 4) show evenly spaced alkanes which are typical of fresh fuel. The narrative in the analytical report (Appendix E) indicates that that the DRO patterns for the samples from boreholes BH-1 at 14 to 16 feet bgs, BH-2 at 18 to 20 feet bgs, and BH-2 at 25 to 26 feet bgs were consistent with a weathered middle distillate. The chromatograms for those samples showed a mix of some light-end fuel (GRO) with DRO.

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4. QUALITY ASSURANCE REVIEW

Laboratory quality assurance/quality control (QA/QC) data associated with the analysis of project samples have been reviewed to evaluate the integrity of the analytical data generated during the January 2014 soil sampling event at the former Circle S Grocery in Chugiak, Alaska for the site investigation. Samples were collected, reported and shipped in general accordance with the ADEC-approved work plan (ERM 2014).

All data were reviewed in accordance with appropriate the USEPA procedural guidance documents (USEPA 2009) and the ADEC regulatory guidance documents (ADEC 2009a; 2012b). An ADEC laboratory checklist was performed (ADEC 2010a) and is attached to this report as Appendix F. This data review focuses on criteria for the following QA/QC parameters and their effect on the quality of data and usability: sample handling and chain-of-custody (CoC) documentation; holding time compliance; field QA/QC (trip blanks, field duplicate) results; laboratory QA/QC (method blanks, laboratory control samples (LCS), surrogates, matrix spike/matrix spike duplicate [MS/MSD]); results and analytical methods; method reporting limits; precision and accuracy; and completeness.

The details of this review and qualification of the data are summarized in the following sections.

4.1. Sample Handling

Soil samples were delivered to SGS in Anchorage, Alaska for analysis. Samples were analyzed for the following:

- GRO, Alaska Method 101.
- BTEX, USEPA Method 8021B.
- DRO, Alaska Method 102.
- PAH - SIM, USEPA Method 8270D-SIM.
- Percent Solids, Standard Method 21-2540G.

SGS analytical results were reported in one sample delivery group (SDG), 1140195.

The sample cooler was shipped with custody seals intact. The CoC form, laboratory sample receipt form and case narratives were reviewed to evaluate the integrity of the samples and the quality of the associated data.

The sample containers in the sample cooler were received at the laboratory intact and within the specified temperature range of 4 degrees Celsius (°C) +/- 2°C, with the following exception. Upon laboratory receipt, the cooler temperature was recorded at a temperature of 1.5°C. No results were qualified due to temperature.

4.2. Holding Time Compliance

All samples were extracted, digested and analyzed within the holding time criteria for the applicable analytical methods and in accordance with work plan specifications.

4.3. Field QA/QC

Field QA/QC protocols are designed to measure for potential sample bias as a result of sampling procedures and possible contamination during collection and transport of samples. Collection and analysis of field duplicates facilitates an evaluation of precision that takes into account potential variables associated with sampling procedures, site heterogeneity and laboratory analyses. Trip blanks are used to monitor sample containers and possible cross-contamination of samples. For this project, both trip blank and field duplicate samples were submitted.

4.3.1. Trip Blanks

Trip blanks were prepared by the laboratory, shipped to the site with the empty sample bottles/containers, stored with sample containers during the field event, and transported with the collected samples back to the laboratory for analysis.

Trip blanks were placed in the cooler with associated matrix-specific volatile organics samples. The concentrations of all analytes were below the detection limit (DL) in all associated project trip blank samples.

4.3.2. Field Duplicate Samples

Out of a total of 10 primary soil samples submitted, there was 1 field duplicate sample submitted - primary 14-CGS-07-SS with duplicate 14-CGS-08-SS.

When analytes were detected in both duplicate pairs above the reporting limit (RL), the relative percent differences (RPD) between the analytes were calculated. All RPDs between primary and duplicate met the ADEC recommended limit of RPDs <50% for soil samples, with the following exceptions.

The RPD between the primary and duplicate sample exceeded the ADEC recommended limit of <50% for soil samples in the following analytes: GRO (131.15%); DRO (51.39%); benzene (100.17%); toluene (111.78%); ethylbenzene (125.65%); total xylenes (127.79%); naphthalene (50.62%); and phenanthrene (52.52%). Associated results were qualified as estimated (JD).

4.4. Laboratory QA/QC

4.4.1. Laboratory Blanks

Laboratory/ Method blanks were analyzed concurrent with an analytical batch of 20 or fewer primary samples for each of the analytical methods performed on project samples. Target analytes were not detected (U) in any laboratory blanks.

4.4.2. Surrogates

System Monitoring Compounds (surrogates) are specified for organic chromatographic analytical procedures. Surrogates are compounds similar to target analytes and are added to each sample prior to collection or extraction. Subsequent surrogate recovery indicates overall method performance. Surrogate recoveries were within prescribed control limits for all primary samples, method blanks, laboratory control samples/laboratory control sample duplicates (LCSD), MS/MSD and other QA/QC samples, with one exception. The GRO surrogate 4-bromofluorobenzene was above the limits in samples 14-CGS-02-SS, 14-CGS-03-SS, 14-CGS-07-SS and 14-CGS-11-SS. GRO results were qualified as estimated (J).

4.4.3. Laboratory Control Samples

The laboratory monitors internal precision and accuracy for each analytical batch with a set of LCS/LCSD. Two sample aliquots of the same sample are taken in the analytical laboratory and analyzed separately with identical procedures. Analyses of the sample and duplicate give a measure of the precision associated with laboratory procedures but not with sample collection, preservation or storage procedures. A known quantity of target analytes are added to blank laboratory control samples prior to extraction, and analysis and recoveries are calculated. Acceptable recovery criteria vary with each analytical method and matrix. All LCS/LCSD samples met laboratory and project QC goals for target analytes in all SDGs.

4.4.4. Matrix Spike Samples

MS/MSD analyses were performed. Matrix spikes have a known quantity of target analytes added (spiked) to field samples. Spike recoveries are calculated and are used to evaluate both site conditions and laboratory quality control. Matrix spikes met recovery percentages (%R) and RPD limits, with one exception.

The MS/MSD %R and RPDs were outside the limits in 8270D-SIM analysis due to sample dilution. The associated results include 14-CGS-02-SS, 14-CGS-07-SS, and 14-CGS-08-SS. The associated LCS/LCSD was within limits and used to determine accuracy of results for these samples. No data was qualified.

4.4.5. Detection Limits (Sensitivity)

Sample results that were between the DL and the Limit of Quantitation were qualified as estimated (J). Sample results that were below the DL were qualified as not detected (U) at the Limit of Detection, which is twice the DL. The laboratory established detection limits (DL) were below the ADEC cleanup levels.

4.5. Precision and Accuracy

Precision criteria monitor analytical reproducibility. Accuracy criteria monitor agreement of measured results with "true values" established by spiking applicable

samples with a known quantity of analyte or surrogate. Precision and accuracy were evaluated by comparing LCS/LCSDs, MS/MSDs, and field duplicate pairs for this project. Field duplicate samples and MS/MSD samples were collected in accordance with work plan specifications. Field duplicate RPDs met applicable control limits, with the exceptions noted in Section 4.3 Field QA/QC. Recoveries and RPDs for all LCS/LCSD and MS/MSD samples were within required limits except as noted in the Laboratory QC section.

4.6. Completeness

Data completeness is defined as the percentage of usable data (usable data divided by the total possible data). The overall project completeness goal is 90%:

$$\% \text{ completeness} = \frac{\text{number of valid (i.e., non-R flagged) results}}{\text{number of possible results}}$$

All requested analyses were performed in accordance with Work Plan specifications. No samples were qualified as unusable (i.e., "R"). Completeness for this project is 100.0%.

4.7. Representativeness

Data representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, or environmental condition. The number and selection of samples were specified in the work plan and verified in the field to account accurately for site variations and sample matrices. The data quality objective (DQO) for representativeness was met.

4.8. Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared to another. Data produced for this project followed applicable field sampling techniques and specific analytical methodology. The DQO for comparability was met.

4.9. Data Summary

In general, the overall quality of the data was acceptable. The data quality was determined as acceptable or estimated. Acceptable data are associated with QC data, which meet all QC criteria or with QC samples, which did not meet QC criteria but DQOs were not affected. Estimated J results are considered inaccurate or estimated QC acceptance criteria, which were not met. No results were rejected. The USEPA National Functional Guidelines (USEPA 2008) were used to evaluate the acceptability of the data.

Data quality meets the DQOs established for this project. With the exceptions noted above, all data are suitable for their intended use.

5. CONCLUSIONS AND RECOMMENDATIONS

Review of site investigation results supports that petroleum hydrocarbons remain in the subsurface soil at concentrations exceeding applicable ADEC Table B1 and B2 soil cleanup levels within the footprint of the former UST location. Petroleum hydrocarbon concentrations in excess of ADEC soil cleanup levels were detected in samples as shallow as 14 feet bgs and as deep as 82 feet bgs (both from borehole BH-1).

With the exception of the sample collected from borehole BH-1 at the 14 to 16 feet bgs interval, there were no exceedances of applicable ADEC soil cleanup levels in soils above the liner, which was installed at a depth of approximately 15 to 16 feet bgs (New Horizons Telecom, Inc. 1995). Review of the data and associated chromatograms from this investigation indicates that the UST removed in 2012 may be the potential source for the DRO contamination remaining in soils within the lined excavation area. The USTs removed in 1995 are the likely source of GRO and BTEX contamination remaining in deeper (below the liner) soils at the site.

On-site interpretation of field screening readings taken at depth in borehole BH-1 indicated that volatile contaminant concentrations at 80 feet bgs would likely be below applicable soil cleanup levels. Consequently, the borehole was terminated before groundwater was encountered, and a monitoring well was not installed. However, analytical results for the sample collected from borehole BH-1 at 80 to 82 feet bgs document that benzene is present in the soil at concentrations in excess of the migration-to-groundwater soil cleanup level. Considering these results, a potentially completed exposure pathway to current receptors exists via ingestion of groundwater.

ERM recommends sampling the closest drinking water well to the site (Ms. Porterfield's well located at 22179 Birchwood Loop Road), and testing the sample for BTEX to determine if the benzene contamination observed at depth in borehole BH-1 has impacted the local aquifer. We also recommend measuring the depth to water and the total well depth in Ms. Porterfield's well, if possible. While it could be possible to excavate and thermally remediate the contaminated soil remaining above the liner in the vicinity of borehole BH-1, this effort would not eliminate the one potentially complete exposure pathway to current receptors (ingestion of groundwater) simply because the excavation could not extend to the depth necessary to remove a substantial portion of the remaining contaminated soils.

ERM recommends re-paving the area excavated during the 2012 UST removal to minimize the infiltration of precipitation. This site modification would reduce the potential for downward migration (leaching) of petroleum hydrocarbons in the footprint of the paved area.

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6. REFERENCES

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- United States Environmental Protection Agency. 2008. Contract Laboratory Program National Functional Guidelines for Organic Superfund Data Review. June. (EPA 540-R-08-01).
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TABLES

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**TABLE 1: SOIL SAMPLE SUMMARY
SITE INVESTIGATION
JANUARY 2014
FORMER CIRCLE S GROCERY SITE, CHUGIAK, ALASKA**

Location ID	Sample Depth (ft.)		Laboratory Sample ID	Field Screening Result (ppm)	Sample Type	Sample Date	Parameters & Method			
	Start	End					GRO AK101	DRO AK102	BTEX SW8021B	PAHs SW8270C SIM
BH-1	10	12		3.6		1/14/2014				
	12	14		3.0		1/14/2014				
	14	16	14-CSG-01-SS	58.6	primary	1/14/2014	✓	✓	✓	
	16	18		1,390		1/14/2014				
	18	20	14-CSG-02-SS	3,337	primary	1/14/2014	✓	✓	✓	✓
	20	22		1,585		1/14/2014				
	25	27		303		1/14/2014				
	30	32		590		1/14/2014				
	40	40.5		360.4		1/14/2014				
	50	51.5		52		1/14/2014				
	60	62	14-CSG-03-SS	1,858	primary	1/14/2014	✓	✓	✓	
70	71		1,875		1/14/2014					
80	82	14-CSG-04-SS	42.7	primary	1/14/2014	✓	✓	✓		
BH-2	10	12		7.8		1/15/2014				
	12	14	14-CSG-05-SS	0.0	primary	1/15/2014	✓	✓	✓	
	14	16		70.9		1/15/2014				
	16	18		N/A		1/15/2014				
	18	20	14-CSG-06-SS	24.6	primary	1/15/2014	✓	✓	✓	
	20	22		619		1/15/2014				
	25	26	14-CSG-07-SS	1,050	primary	1/15/2014	✓	✓	✓	✓
25	26	14-CSG-08-SS	same as above	duplicate	1/15/2014	✓	✓	✓	✓	
BH-3	10	12	14-CSG-09-SS	1.7	primary	1/15/2014	✓	✓	✓	
	12	13		7.0		1/15/2014				
	14	16		5.9		1/15/2014				
	16	18	14-CSG-10-SS	85	primary	1/15/2014	✓	✓	✓	
	18	20		44.8		1/15/2014				
	20	22		21.2		1/15/2014				
25	26	14-CSG-11-SS	3,974	primary	1/15/2014	✓	✓	✓		

Key:

BTEX - Benzene, toluene, ethylbenzene, and total xylenes.

DRO - Diesel range organics.

ft. - feet

GRO - Gasoline range organics.

ID - Identification

N/A - Not available.

PAH - Polynuclear aromatic hydrocarbons.

ppm - Parts per million.

SIM - Selective ion monitoring.

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TABLE 2: SOIL SAMPLE ANALYTICAL RESULTS
 SITE INVESTIGATION
 JANUARY 2014
 FORMER CIRCLE S GROCERY SITE, CHUGIAK, ALASKA

Analyte	ADEC Method 2 Soil Cleanup Levels ¹ (mg/kg)	Sample ID	Soil Samples										QA/QC Samples	
			14-CSG-01-SS	14-CSG-02-SS	14-CSG-03-SS	14-CSG-04-SS	14-CSG-05-SS	14-CSG-06-SS	14-CSG-07-SS	14-CSG-09-SS	14-CSG-10-SS	14-CSG-11-SS	14-CSG-08-SS	TB-01
			Location ID	BH-1			BH-2			BH-3				BH-2
Sample Depth Interval (ft. bgs)	14-16	18-20	60-62	80-82	12-14	18-20	25-26	10-12	16-18	25-26	25-26	NA		
<i>Fuels - AK101/AK102/USEPA 8021B</i>														
GRO	300		69.5	620 JS	70.7 JS	5.99	1.76 J	3.23 J	303 JD,JS	2.99	89.1	762 JS	63 JD	ND (1.23)
DRO	250		713	21.7	7.52 J	ND (10.7)	39.4	243	93.4 JD	ND (10.6)	12.8 J	33.3	158 JD	--
Benzene	0.025		0.201	8.16	0.553	0.323	0.0146 J	0.0174 J	0.448 JD	0.0209 J	0.0482	2.98	0.149 JD	ND (0.00615)
Toluene	6.5		1.46	85.4	3.85	1.01	0.0634	0.0672	6.75 JD	0.164	0.288	38.2	1.91 JD	ND (0.0123)
Ethylbenzene	6.9		1.69	21.2	2.58	0.14	0.0172 J	ND (0.028)	10.6 JD	0.306 J	0.219	21.1	2.42 JD	ND (0.0123)
Total Xylenes	63		7.77	120.3	13.78	0.74	0.1133 J	0.1098 J	49.3 JD	0.308	10.58	164.1	10.86 JD	ND (0.0369)
<i>Polynuclear Aromatic Hydrocarbons - USEPA 8270C SIM</i>														
Fluorene	220		--	ND (0.0261)	--	--	--	--	0.0264 J	--	--	--	0.0421 J	--
1-Methylnaphthalene	6.2		--	0.0728	--	--	--	--	0.089	--	--	--	0.141	--
2-Methylnaphthalene	6.1		--	0.128	--	--	--	--	0.122	--	--	--	0.192	--
Naphthalene	20		--	0.142	--	--	--	--	0.0509 J JD	--	--	--	0.0854 JD	--
Phenanthrene	3,000		--	ND (0.0261)	--	--	--	--	0.049 J JD	--	--	--	0.0839 JD	--

Note: All analytical results are in mg/kg.

Key:

Bold values indicate that the result exceeds the cleanup level.

¹ - 18 AAC 75 Method 2 Soil Cleanup Levels, Tables B1 and B2, Migration to Groundwater pathway (ADEC 2012a).

bgs = Below ground surface.

DRO = Diesel range organics.

ft. = Feet.

GRO = Gasoline range organics.

ID = Identification number.

J = Estimated value.

JD = Result is estimated due to RPD between primary and duplicate exceeding ADEC recommended limits of <50% for soil samples.

JS = Result is estimated due to surrogate percent recovery exceeding the quality control limits.

mg/kg = Milligrams per kilogram.

NA = Not applicable.

ND = Not detected above the method detection limit shown in parentheses.

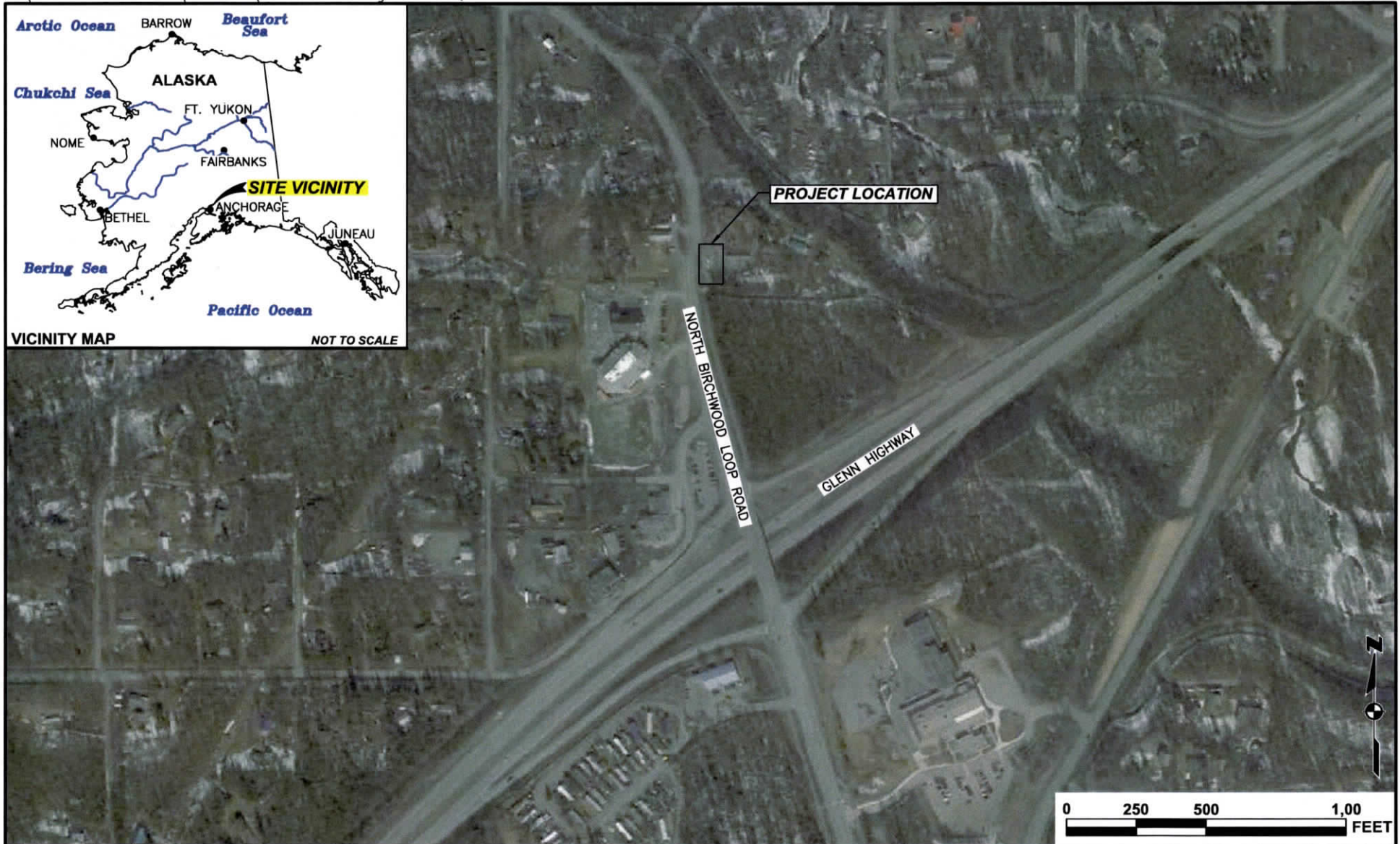
SIM = Selective ion monitoring.


USEPA = United States Environmental Protection Agency.

-- = Not Analyzed.

FIGURES

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	DATE: NOV. 2013
	CHKD: C.O.
	DRAWN: D.R.F.
	PROJ. No.: 0223618
	825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

SITE LOCATION MAP
22189 BIRCHWOOD LOOP ROAD

CIRCLE S GROCERY SITE INVESTIGATION
BERKLEY SPECIALTY UNDERWRITING MANAGERS
Chugiak, Alaska

FIGURE
1

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M:\GIS\Projects\0223618_Circle S Grocery\Fig2_Site_Layout.mxd



DATE: JAN 2014
 CHKD: C.O.
 DRWN: S.M.C.
 PROJ. No.: 0223618
 825 W. 8th Ave., Anchorage,
 AK 99501, (907) 258-4880

SITE LAYOUT

CIRCLE S GROCERY SITE INVESTIGATION
 BERKLEY SPECIALTY UNDERWRITING MANAGERS
 Chugiak, Alaska

FIGURE

2

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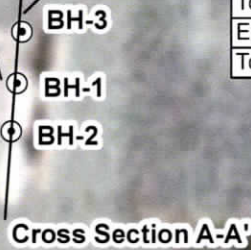




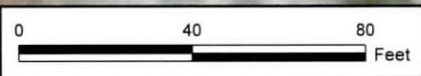
Analyte	Location			
	BH-1			
	14-16' Depth (ft)	18-20' Depth (ft)	60-62' Depth (ft)	80-82' Depth (ft)
GRO	69.5	620	70.7	5.99
DRO	713	21.7	7.52	ND (10.7)
Benzene	0.201	8.16	0.553	0.323
Toluene	1.46	85.4	3.85	1.01
Ethylbenzene	1.69	21.2	2.58	0.14
Total Xylenes	7.77	120.3	13.78	0.74

Analyte	Location	
	BH-3	
	16-18' Depth (ft)	25-26' Depth (ft)
GRO	89.1	762
DRO	12.8	33.3
Benzene	0.0482	2.98
Toluene	0.288	38.2
Ethylbenzene	0.219	21.1
Total Xylenes	10.58	164.1

Analyte	Location
	BH-2 25-26" Depth (ft)
GRO	303
Benzene	0.448
Toluene	6.75
Ethylbenzene	10.6



LEGEND
BOLD INDICATES CLEANUP LEVEL EXCEEDENCE
 ND = NOT DETECTED
 ⊙ = BOREHOLE LOCATION



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



DATE: JAN 2014
 CHKD: C.O.
 DRWN: S.M.C.
 PROJ. No.: 0223618
 825 W. 8th Ave., Anchorage,
 AK 99501, (907) 258-4880

BOREHOLE LOCATIONS AND INVESTIGATION RESULTS

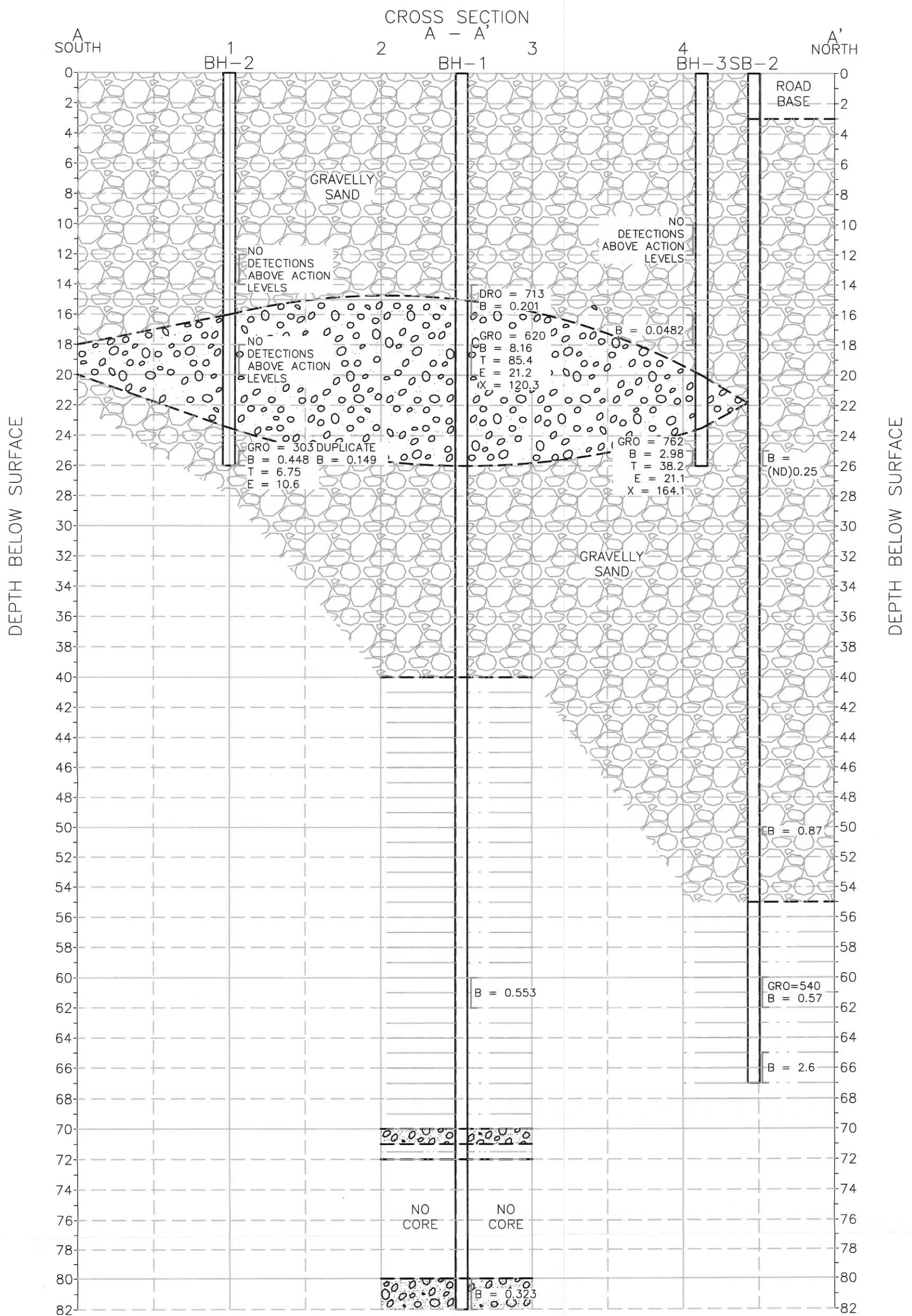
CIRCLE S GROCERY SITE INVESTIGATION
 BERKLEY SPECIALTY UNDERWRITING MANAGERS
 Chugiak, Alaska

FIGURE

3

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SOURCE: DATA FOR SB-2 FROM TELLUS, DATED AUGUST 1999.
NOTE: MUST BE PRINTED IN COLOR

DATE: FEB. 2014
CHKD: C.O.
DRAWN: D.R.F.
PROJ. No.: 0223618
825 W. 8th Ave., Anchorage, AK 99501, (907) 258-4880

CROSS SECTION A-A'

CIRCLE S GROCERY SITE INVESTIGATION
BERKLEY SPECIALTY UNDERWRITING MANAGERS
Chugiak, Alaska

FIGURE
4

APPENDIX A

Conceptual Site Model Human Health Scoping Form and Graphical Form

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Human Health Conceptual Site Model Scoping Form

Site Name: Circle S Grocery

File Number: 2106.26.004

Completed by: Caryn A. Orvis, C.P.G.

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: *Follow the italicized instructions in each section below.*

1. General Information:

Sources (*check potential sources at the site*)

- | | |
|---|---------------------------------------|
| <input checked="" type="checkbox"/> USTs | <input type="checkbox"/> Vehicles |
| <input type="checkbox"/> ASTs | <input type="checkbox"/> Landfills |
| <input checked="" type="checkbox"/> Dispensers/fuel loading racks | <input type="checkbox"/> Transformers |
| <input type="checkbox"/> Drums | <input type="checkbox"/> Other: _____ |

Release Mechanisms (*check potential release mechanisms at the site*)

- | | |
|---|---|
| <input type="checkbox"/> Spills | <input type="checkbox"/> Direct discharge |
| <input checked="" type="checkbox"/> Leaks | <input type="checkbox"/> Burning |
| | <input type="checkbox"/> Other: _____ |

Impacted Media (*check potentially-impacted media at the site*)

- | | |
|---|---|
| <input type="checkbox"/> Surface soil (0-2 feet bgs*) | <input checked="" type="checkbox"/> Groundwater |
| <input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs) | <input type="checkbox"/> Surface water |
| <input checked="" type="checkbox"/> Air | <input type="checkbox"/> Biota |
| <input type="checkbox"/> Sediment | <input type="checkbox"/> Other: _____ |

Receptors (*check receptors that could be affected by contamination at the site*)

- | | |
|--|--|
| <input checked="" type="checkbox"/> Residents (adult or child) | <input checked="" type="checkbox"/> Site visitor |
| <input checked="" type="checkbox"/> Commercial or industrial worker | <input checked="" type="checkbox"/> Trespasser |
| <input checked="" type="checkbox"/> Construction worker | <input type="checkbox"/> Recreational user |
| <input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods) | <input type="checkbox"/> Farmer |
| <input type="checkbox"/> Subsistence consumer (i.e. eats wild foods) | <input type="checkbox"/> Other: _____ |

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site-specific basis.)

If the box is checked, label this pathway complete:

Complete

Comments:

Concentrations of DRO and benzene exceeded their applicable ADEC soil cleanup levels in one sample collected at a depth interval of 14 to 16 feet below ground surface (bgs).

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)?

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

The compounds detected in the soil samples collected at depths shallower than 15 feet bgs are not listed in Appendix B of the guidance document.

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater, or are contaminants expected to migrate to groundwater in the future?

Could the potentially affected groundwater be used as a current or future drinking water source? Please note, only leave the box unchecked if DEC has determined the groundwater is not a currently or reasonably expected future source of drinking water according to 18 AAC 75.350.

If both boxes are checked, label this pathway complete:

Complete

Comments:

Groundwater was not encountered in the 2 soil borings advanced to depths of approximately 67 feet bgs at the site in 1999 or in the soil boring advanced to 82 feet bgs during the 2014 site investigation. It is assumed that given the depth to groundwater (greater than 80 feet bgs), any exposure to site contaminants is insignificant.

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

Surface water bodies are not present in close proximity to the site.

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

Site contaminants are not listed in Appendix C of the guidance document.

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Complete

Comments:

Benzene was detected at a concentration greater than the ADEC soil cleanup level in 1 sample collected at a depth interval of 14 to 16 feet bgs. Given the depth to contaminated soil and the fact that potential exposure would come from outdoor air, any exposure to site contaminants via this pathway would be insignificant.

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)

Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

The occupied building present at the site is located greater than 30 horizontal feet from the petroleum contaminated soil remaining at the site.

3. **Additional Exposure Pathways:** *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:



Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:



Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Circle S Grocery
 ADEC File No. 2106.26.004

Completed By: Caryn A. Orvis, C.P.G.
 Date Completed: 11 February 2014

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Check the media that could be directly affected by the release.

(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.

Media	Transport Mechanisms
<input type="checkbox"/> Surface <input type="checkbox"/> Soil (0-2 ft bgs)	<input type="checkbox"/> Direct release to surface soil check soil <input type="checkbox"/> Migration to subsurface check soil <input type="checkbox"/> Migration to groundwater check groundwater <input type="checkbox"/> Volatilization check air <input type="checkbox"/> Runoff or erosion check surface water <input type="checkbox"/> Uptake by plants or animals check biota <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input type="checkbox"/> Direct release to subsurface soil check soil <input checked="" type="checkbox"/> Migration to groundwater check groundwater <input checked="" type="checkbox"/> Volatilization check air <input type="checkbox"/> Uptake by plants or animals check biota <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Ground-water	<input type="checkbox"/> Direct release to groundwater check groundwater <input type="checkbox"/> Volatilization check air <input type="checkbox"/> Flow to surface water body check surface water <input type="checkbox"/> Flow to sediment check sediment <input type="checkbox"/> Uptake by plants or animals check biota <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water check surface water <input type="checkbox"/> Volatilization check air <input type="checkbox"/> Sedimentation check sediment <input type="checkbox"/> Uptake by plants or animals check biota <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment check sediment <input type="checkbox"/> Resuspension, runoff, or erosion check surface water <input type="checkbox"/> Uptake by plants or animals check biota <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).

(4) Check all pathways that could be complete. The pathways identified in this column **must** agree with Sections 2 and 3 of the Human Health CSM Scoping Form.

(5) Identify the receptors potentially affected by each exposure pathway. Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.

Current & Future Receptors

Exposure Media	Exposure Pathway/Route	Residents or children (adults or children)	Commercial or Industrial workers	Site visitors, trespassers or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion	F	F	F	F			
	<input type="checkbox"/> Dermal Absorption of Contaminants from Soil							
	<input type="checkbox"/> Inhalation of Fugitive Dust							
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater	I						
	<input checked="" type="checkbox"/> Dermal Absorption of Contaminants in Groundwater	I						
	<input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	I						
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air	I	I	I	I			
	<input type="checkbox"/> Inhalation of Indoor Air							
	<input type="checkbox"/> Inhalation of Fugitive Dust							
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water							
	<input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water							
	<input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

APPENDIX B

Field Notes

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ALL-WEATHER WRITING PAPER

Name **ERM ALASKA**

Address **825 W 8th Ave
ANCHORAGE AK 99501**

Phone **907-258-4880**

Project **Berkley Specialty Underwriting
Circle S Grocery
0223618**

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RiteintheRain.com

11/11/00 CIVIC S BOROUGHS S. CHRISTIANSEN
1P overcast M. HAUSER

0930 Arrive onsite Meet up with Discovery
Drilling guys and ~~Orvis~~ Orvis.
Conduct a site walk about
overhead lines. Conduct tailgate safety
Trace electrical with T1000 line locator
Determine that the sign electrical wire
is not a problem.

1030 Set up on 80 ft MW location and
start drilling after getting the go ahead
from Jeff Gearty

10:45 - Begin drilling @ 80'
11:20 - offsite to get decon water
11:40 - onsite - decon sample
11:45 - begin split spoon
run 10-12 6, 7, 10 | 0.5' recovery
run 12-14 3, 2, 2, 1 | 1.3' recovery
run 14-16 9, 3, 5, 7, 5, 0 | 0.75' recovery
10-12 ^{1.5m} gravel with some sand
12-14 ^{1.5m} gravel with some sand
~~17-19~~ No soil
16-18 4, 19, 35, 59 | 1.9' recovery
18-20 22-35-53 | 1.7' recovery
20-22 12, 39, 53 | 1.7' recovery

Return on site

Blank, Shaw 28 01/17/74

Sample 13-CSG-01-SS @ 12:00 for BTEX, GRO, ORO
Sample 13-CSG-02-SS @ 12:30 for BTEX, GRO, ORO
12:50 - back to lunch.

UAI resume drilling after 13:25 - Resume shaft from 35-27' 18 66 - Rec 11'
27-30- HSA through sandy gravel in drill cuttings
30-32' 60, 47, 50 Rec. 1.5'
32-40- HSA no spoon collected brown sandy gravel in cuttings
14:30 Discovery dropped pit + head down the auger stem @ 40' trying to get it on track. May have to drill pit it

15:00 going to attempt to drill pit it.
15:05 40-40.5 67 0.7 recovery
15:15 Resume HSA to 50'
15:20 site shut 50-52' interval
15:35 to determine sample
15:45 - 16:15 up 50' sample

Circles 01/17/74

50-51.5 17, 28, 30
1.3' recovery
Betty reads for 60' sample - Priority indicates Post drilling with label around 53'

50-62- 12, 25, 27, 1.9' rec
will sample
13-65-203-58 61.5-62'
@ 1600
60-71 12, 53 1' recovery
headed workspace @ 705 - 1875 ppm
80-82' 3828, 30, 50 2' recovery
dry - no water

Spent w/ Cohn about 9:00
deeper if 80-82' interval is dirty
she says not to
will sample location in interval
17:45 - Sample 13-65-07-51
@ 81' headed workspace 42, 70 ppm
Cleaning up. Spent w/ another
store about 1 hour drilling dry
overnight. They said it's OK.
Run down HSA through GAT

Let in the Rain

0/17/14 Circle 5 Gul
7:40 - off site

1/15/14 CS Gas station -

Weather: Cloudy 26
Pressure: 45.4 barometric 25.1
on 2 holes

Personnel: M. Huse S. Christman
+ Oliver Bailey

0930 - arrive @ CS Gas

Setting up for Days
0940 - Discontinuing work

Hit Tailgate meeting

Calibrate PPD Gasbar O₂ span Special - 100%
0950 - Begin rearing injectors from 80'

hole + attempting to put soil
cutting) back down being

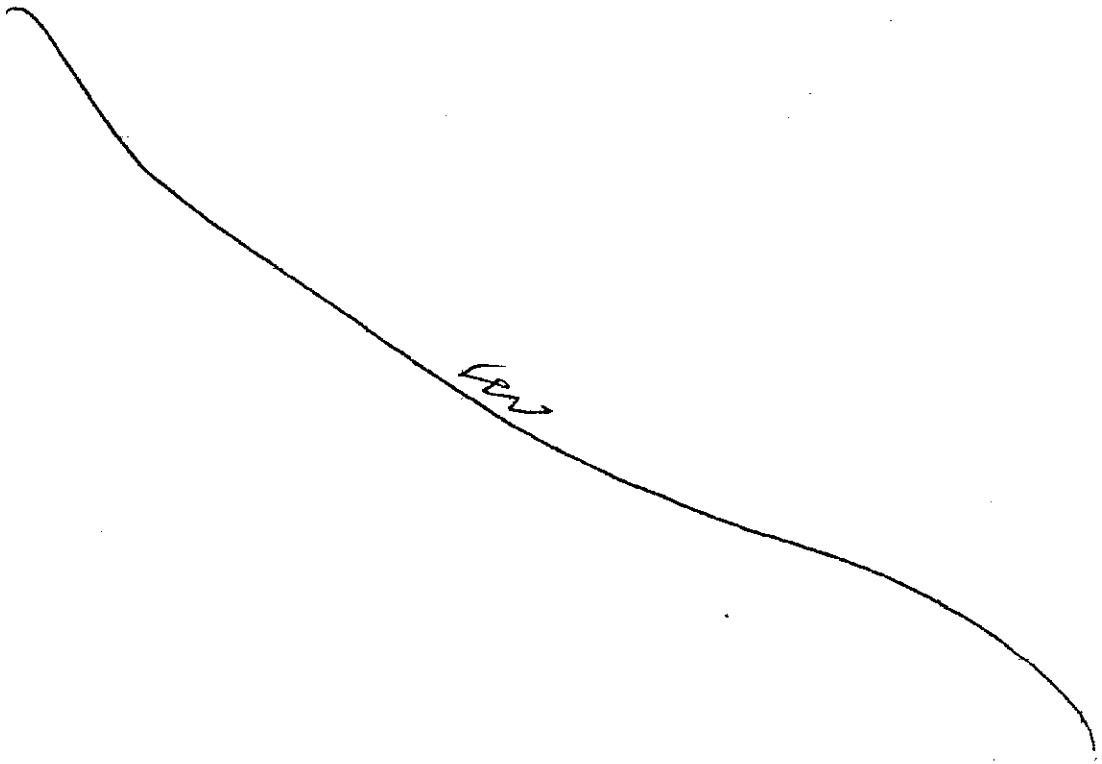
Monitoring breathing area around
buckled - Jumping between
0100pm - 30ppm

may be due to tall exhaust.
move PPD off track and hold

in breathing space - 80ppm around 30ppm
Monday 11/10' from 80' hole for
high - 25' hole. Due to utility

issues cannot go any more forward

After an hour



14-16-75 (SWS) starting

14-16-75
14.5' - 0.2 ppm
15.5' - 1.7 ppm
16-18' 16' - 0.3 ppm
17' - 0.4 ppm
18' - 0.7 ppm

18-20
Cavit. Sand pump
heated headspace @ 14-16' 70 ppm
heated headspace @ 16-18' N/A
1.3 recovery
3, 2, 1, 2

18' - 0.3 ppm
18.5' - 1.3 ppm
19.5' - 5.7 ppm
19.5' - 3.6 ppm
20' - 0.7 ppm
Bore gavelly sand, wet no
odor

Sample @ 18.5' - 19.5' @ 11:40
Sample @ 13-14' @
Sample @ 25' @
20-22' - 2.6 ppm
20 - 1.2 ppm
20.5 - 1.9 ppm
220-50 ppm
21 - 6.2 ppm

Return the Rain

1/15/74
0:55 - setting up rig on 1st 25' borehole

0:50 - begin HSA at 0-10'
Bore gavelly sands, no odor
headspace of cuttings @
approx 51' - heated headspace 0.9 ppm

11:00 Run 10-12' 522.2
recovery - 1.0'
2:05 Run 12-14' 2.2 ppm
recovery - 0.4'

0:12 Bore gavelly sand
no odor
headspace @ 11' - 0.7 ppm
heated headspace @ 11' 7.8 ppm

2:14 Bore gavelly sand
no odor @ 13' - 0.7 ppm
14-16 = 3.5 ppm
recovery 1.0'
wet bore gavelly sand
16-18 4.3, 3.2 - 0.9 recovery

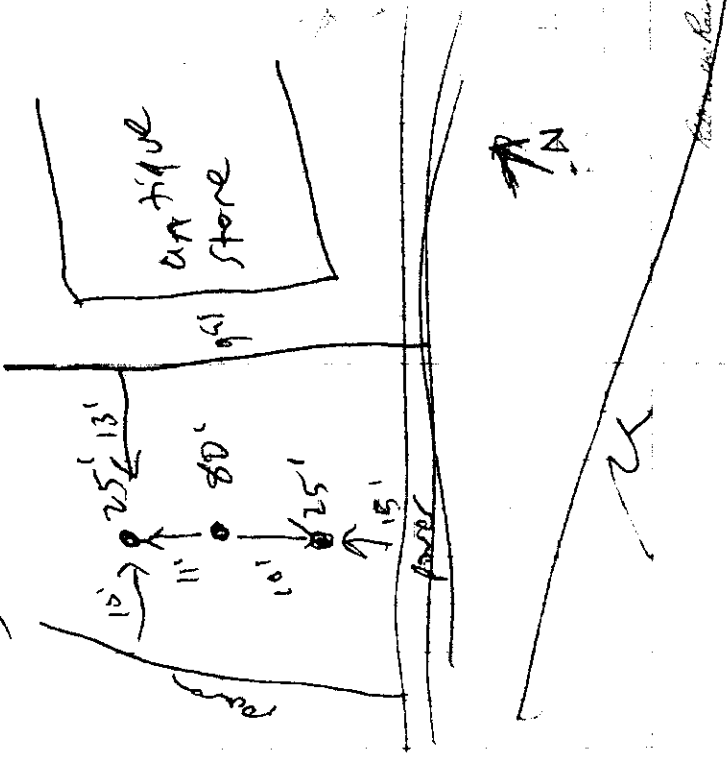
21

1/15/14 CS Gas Station
20-22 -

20-21.5 - Det brown sandy
gravel
Sandy gravel, grey, greenish sand
problem odor
25-26" = 21,50 13' recovery
25 - 92ppm
25.5 - 650ppm
26" = 1050ppm
light brown sandy gravel
odor, sharp
Sample 25.05 - 261

19-20' heated hydrocarbon 2400ppm
Sample hole 2
14-25.5 - 08-55 @ 13.4M
14-25.6 - 06-55 @ 18.5-19.5
14-25.6 - 07-55 @ 5.5-2.6
14-25.6 - 08-55 @ 25.5-2.6
12:30 - Check on wells @
1041 buildings
- 22186 - ble house across from
Site - none home

01/15/14 CS Gas Station
2211 McKinley View
owner Steve Hawthorth
577 his property on well
15' 150' depth. adjacent
house & church are also
on wells.
12:40er Book on site to
begin hole #3 25'
moved approx 11' from 80'
to 79'



11/15/14 CS Gas

13:00 - Heated headspace from #3 @ ~5' cuttings

10-12' - 12, 17, 26, 30 1.8' recovery
10.0 - 0.1 ppm 11.5 - 0.6 ppm
10.5 - 0.2 ppm 12.0 - 0.3 ppm
11.0 - 0.3 ppm

10-11 - wet sandy gravel, large gravel chunks brown/grey
11-12 - frozen sandy gravel base
gravel chunks brown/grey heated headspace
sample @ 11 - 11.5 1.7 ppm

heated head space @ 11.5
12-13 - 45, 55 1' recovery
12 - 0.6 ppm heated headspace
12.5 - 0.3 ppm @ 12' 7.0 ppm
13 - 0.6 ppm

Frozen sandy gravel, large gravel chunks brown/grey
14-16 24, 24, 50 1.4' recovery
14 - 0.7 ppm 15.5 - 0.7 ppm
14.5 - 0.5 ppm 16 - 1.0 ppm
15 - 0.0 ppm

heated headspace @ 14' 5.9 ppm
15.5-16'

CS Gas 11/15/14

14-16 Broken ~~gravel~~ Sandy gravel
16-18 17, 45, 50 11.5' recovery
16.0 - 33.6 17.5 - 85 ppm
16.5 - 17.4 18.0 - 16.9 ppm
17.0 - 22.0

16-16.3 - Rock
16.3-18 - Brown/grey sandy gravel
Bump check PID 95.4 ppm
fresh air Cal. 0.0

18-20 13, 53, 50 rec - 1.5'
18 - 53 ppm 18.5 - 8.4 ppm
18.5 - 7.7 ppm 20 - 12.6 ppm
19 - 19 ppm 20

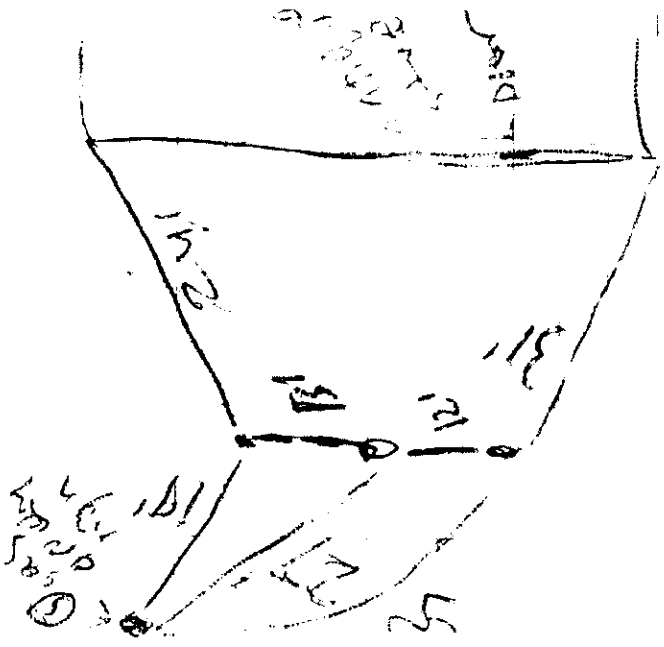
with sample @ 16.5-17 interval
heated headspace @ 19' 44.8 ppm
20 - 2.7 29, 60
20 - 7.6 ppm 21.5 - 5.9 ppm
20.5 - 7.6 ppm 22 - 3.5 ppm
21 - 3.5 ppm 11, 43 1' recovery
25 - 2.6 11, 43 26 - 39.74
25 - 30 ppm
25.5 - 150 ppm

11'

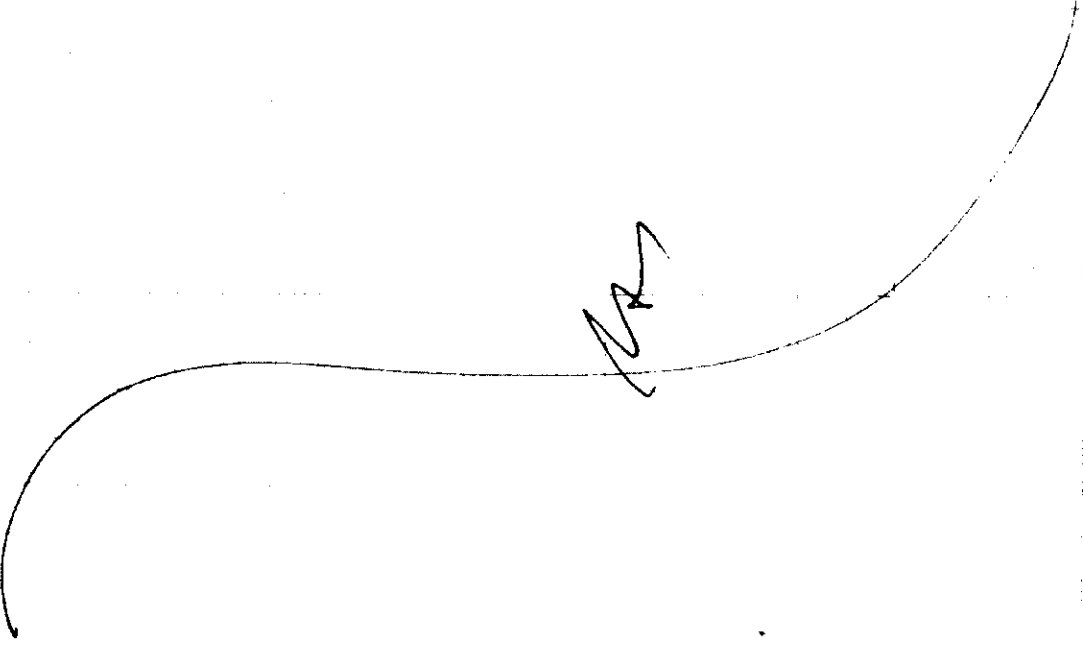
1/15/14 CS (u)

Sample @ 25.5-26'
vented headspace @ 24' 21.2 ppm
20-22'

Brown, gravelly sand dry
25-26' Brown gravelly sand, dry
odor. Pit @ 25.5-25.6'
Spack of fempy about
well with - says she +
former more or less same well



1/15/14
16:00 - off 3.2K



1/15/14

APPENDIX C

Site Photographs

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PHOTOGRAPH 1: SITE WALK WITH UTILITY COMPANY, LOOKING SOUTHWEST



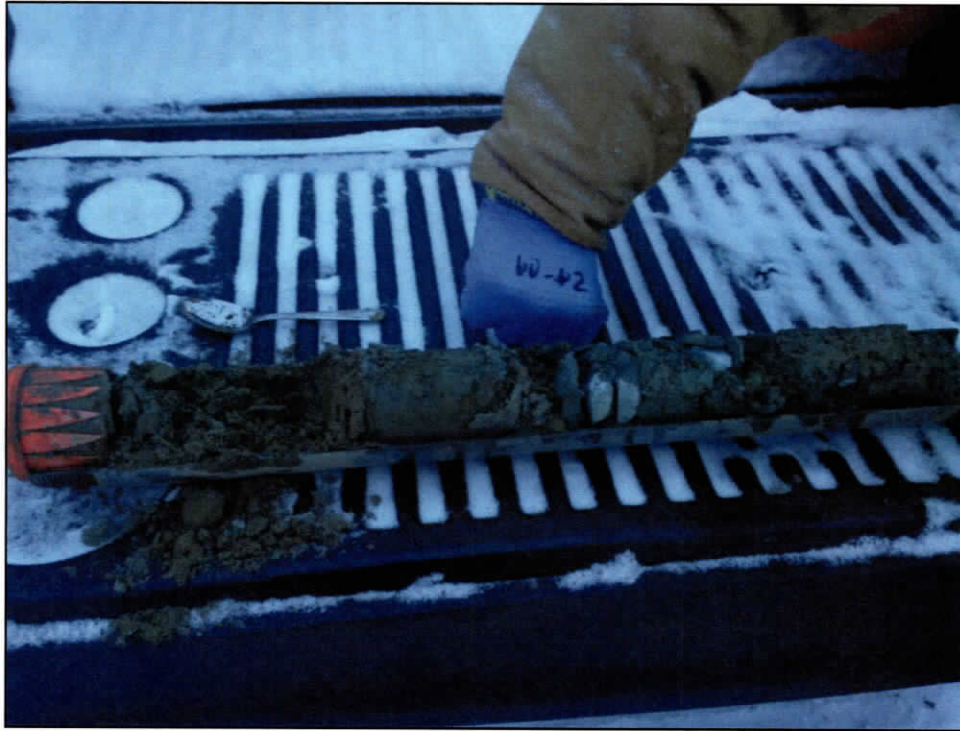
PHOTOGRAPH 2: SOIL CORE FROM BOREHOLE 1 16-18' DEPTH



PHOTOGRAPH 3: SOIL CORE FROM BOREHOLE 1 18-20' DEPTH



PHOTOGRAPH 4: SOIL CORE FROM BOREHOLE 1 20-22' DEPTH



PHOTOGRAPH 5: BOREHOLE 1 60-62'



PHOTOGRAPH 6: BOREHOLE 2 20-22'



PHOTOGRAPH 7: BOREHOLE 2 25-26'



PHOTOGRAPH 8: BOREHOLE 3 10-12'



PHOTOGRAPH 9: BOREHOLE 3 12-13'



PHOTOGRAPH 10: DRILL RIG SET UP AT BOREHOLE 1



PHOTOGRAPH 11: DRILLRIG SET UP AT BOREHOLE 3



**PHOTOGRAPH 12: SUPERSACK STAGED ONSITE AFTER WORK WAS COMPLETED
WITH EXCESS SOIL CUTTINGS**



PHOTOGRAPH 13: DRILLING AREA, AFTER WORK COMPLETION

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APPENDIX D

Borehole Logs

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ERM
 825 W. 8th Ave.
 Anchorage, AK 99501
 Phone: (907) 258-4880
 Fax: (907) 258-4033

LOG OF BOREHOLE: BH #1

Project Number: 0223618

Project Name: Circle S

Location: Chugiak, AK

Contractor:

Drilling Method: Hollow Stem Auger

Logged By: M. Hauser

Date Started:

Date Completed:

Total Depth: 82 feet

Borehole Diameter:

Initial Water Level: feet bgs

Notes:

BOREHOLE TO 40FT ANC PID - -2/11/14 14 25 - M/CAD/CINT BORING LOGS/BERKLEY-CIRCLES.GPJ

Depth (ft)	PID (ppm)	USCS Code	GRAPHIC LOG	Soil Descriptions and Observations
5		GP		GRAVEL (GP) some sand, no odor
10	1.5 3.6	GP		GRAVEL (GP) some sand, no odor @ 11 to 12 feet: heated head space 3.3 ppm
15	11.2 58.6	GP SP-GP		GRAVEL (GP) brown/gray, sandy GRAVELLY SAND (SP-GP) brown/gray
18.2	198	SP-GP		14-CSG-01-SS 12:00
837	604	SP-GP		GRAVELLY SAND (SP-GP) brown/gray, strong petroleum odor, damp
1390	374	SP-GP		GRAVELLY SAND (SP-GP) brown/gray, strong petroleum odor, damp
20	3337 152 275 /	SP-GP GP		@ 18 to 20 feet: 14-CSG-02-SS GRAVELLY SAND (SP-GP) brown, odor
25	650 1585 / 205 697 567	SP-GP GP		@ 21.5 feet: large rock @ 21.9 to 22 feet: brown gravelly sand - odor GRAVELLY SAND (SP-GP) brown, observed via auger cuttings
30	10.9 40.9 83 157 170 303	SP-GP GP		GRAVELLY SAND (SP-GP) brown, damp SANDY GRAVEL (GP) brown/gray
35	370 576 590	GP GP		@ 31.5 to 32 feet: heated head space 1539 ppm SANDY GRAVEL (GP) brown, observed in drill cuttings



ERM
 825 W. 8th Ave.
 Anchorage, AK 99501
 Phone: (907) 258-4880
 Fax: (907) 258-4033

LOG OF BOREHOLE: BH #1

Project Number: 0223618
 Project Name: Circle S
 Location: Chugiak, AK
 Contractor:
 Drilling Method: Hollow Stem Auger
 Logged By: M. Hauser

Date Started:
 Date Completed:
 Total Depth: 82 feet
 Borehole Diameter:
 Initial Water Level: feet bgs
 Notes:

Depth (ft)	PID (ppm)	USCS Code	GRAPHIC LOG	Soil Descriptions and Observations
45	3669	SM		SILTY SAND (SM) brown, with gravel
50	51.7 273 1855	SM		SILTY SAND (SM) brown, with gravel, odor @ 50 to 50.3 feet: large cobble @ 50.3 to 50.5 feet: brown silty sand + gravel SILTY SAND (SM) brown, with gravel, damp
55				@ 60 to 62 feet: 14-CSG-03-SS @ 60 to 60.9 feet: brown silty sand + gravel, damp, odor @ 60.9 to 61.1 feet: rock @ 61.1 to 62 feet: fine brown silty sand, odor
60	48.8 2747 1185 1852 805	SM		
70	31.2 90.9 5.8	SP- GP SM		GRAVELLY SAND (SP) brown, damp @ 70.9 to 71 feet: rock SILTY SAND (SM) brown @ 71.5 feet: heated headspace 1875 ppm
75				

BOREHOLE TO 40FT ANC PID - -2/11/14 14:25 - MACADIGINT BORING LOGS\BERKLEY CIRCLES.GPJ



ERM
 825 W. 8th Ave.
 Anchorage, AK 99501
 Phone: (907) 258-4880
 Fax: (907) 258-4033

LOG OF BOREHOLE: BH #1

Project Number: 0223618

Project Name: Circle S

Location: Chugiak, AK

Contractor:

Drilling Method: Hollow Stem Auger

Logged By: M. Hauser

Date Started:

Date Completed:

Total Depth: 82 feet

Borehole Diameter:

Initial Water Level: feet bgs

Notes:

Depth (ft)	PID (ppm)	USCS Code	GRAPHIC LOG	Soil Descriptions and Observations
1.7				GRAVELLY SAND (SP) brown, w/ silt @ 80 to 82 feet: 14-CSG-04-SS @ 81.5 feet: rock Total Depth - 82 feet bgs
4.3		SP		
3.7		GP		
2.3				
26				
85				
90				
95				
100				
105				
110				
115				

BOREHOLE TO 40FT ANC PID - - 2/11/14 14:25 - M:\CADIGINT BORING LOGS\BERKLEY-CIRCLES.GPJ



ERM
 825 W. 8th Ave.
 Anchorage, AK 99501
 Phone: (907) 258-4880
 Fax: (907) 258-4033

LOG OF BOREHOLE: BH #2

Project Number: 0223618

Project Name: Circle S

Location: Chugiak, AK

Contractor:

Drilling Method: Hollow Stem Auger

Logged By: M. Hauser

Date Started:

Date Completed:

Total Depth: 26 feet

Borehole Diameter:

Initial Water Level: feet bgs

Notes:

Depth (ft)	PID (ppm)	USCS Code	GRAPHIC LOG	Soil Descriptions and Observations
5		GP		GRAVEL (GP) some sand, no odor @ 12 to 14 feet: 14-CSG-05-SS @ 14 to 16 feet: heated headspace 70.9 ppm
15	1.7	SP- GP		GRAVELLY SAND (SP) brown, damp 0.9' recovery
20	0.3 0.4 0.7 0.3 1.3 5.7	SP- GP		GRAVELLY SAND (SP) brown, wet, no odor 1.3' recovery
20	3.6	SP- GP		@ 18 to 20 feet: 14-CSG-06-SS
25	0.7 1.2 1.4 6.4 14.5 619	GP		GRAVELLY SAND (SP) brown, wet @ 21.5 feet: 1.4' recovery, gray sandy gravel, odor
25	9.2 650 1050	GP		SANDY GRAVEL (GP) light brown, damp, odor @ 25 to 26 feet: 14_CSG-07-SS; 14_CSG-08-SS (Duplicate)
				Total Depth - 26 feet bgs

BOREHOLE TO 40FT ANC PID - 2/11/14 14/25 - MACADAM BORING LOGS/BERKLEY-CIRCLES GP



ERM
 825 W. 8th Ave.
 Anchorage, AK 99501
 Phone: (907) 258-4880
 Fax: (907) 258-4033

LOG OF BOREHOLE: BH #3

Project Number: 0223618

Project Name: Circle S

Location: Chugiak, AK

Contractor:

Drilling Method: Hollow Stem Auger

Logged By: M. Hauser

Date Started:

Date Completed: 1/15/2014

Total Depth: 26 feet

Borehole Diameter:

Initial Water Level: feet bgs

Notes:

Depth (ft)	PID (ppm)	USCS Code	GRAPHIC LOG	Soil Descriptions and Observations
5		GP		GRAVEL (GP) some sand, no odor
10	0.1 0.2 0.3 0.6	GP		SANDY GRAVEL (GP) brown/gray, wet, some cobbles @ 10 to 12 feet: 14-CSG-09-SS
11	0.3 0.6 0.3	GP		@ 11 feet: frozen, brown/gray, sandy gravel, some cobbles, heated headspace 1.7 ppm
12	0.6 0.1	GP		@ 12 feet: heated headspace 7.00 ppm, 1' recovery
15	0.5 0	GP		SANDY GRAVEL (GP) brown, frozen 1.4' recovery heated headspace
16	0.2 1	GP		@ 16 feet: cobble
16 to 18	33.6 174	GP		@ 16 to 18 feet: 14-CSG-10-SS
20	220 85 16 53 77	GP SP- GP		SANDY GRAVEL (GP) brown/gray 1.5' recovery
19	8.9			heated headspace 44.8 ppm
21.5	12.6			GRAVELLY SAND (SP) brown, dry
25	22 3.5 5.8 3.5	SP- GP		GRAVELLY SAND (SP) brown, dry 1' recovery
25 to 26	30 150 3974			@ 25 to 26 feet: 14-CSG-11-SS Total Depth - 26 feet bgs

BOREHOLE TO 40FT ANC PID - - 2/11/14 14:25 - M:CADIGINT BORING LOGS:BERKLEY-CIRCLES.GPJ

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APPENDIX E

Laboratory Analytical Report

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Laboratory Report of Analysis

To: Oasis Env/ERM-West, Inc.
825 W. 8th Avenue
Anchorage, AK 99501
907-264-4442

Report Number: 1140195

Client Project: Circle S Grocery 0223618

Dear Caryn Orvis,

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

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

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

Sincerely,
SGS North America Inc.

Chuck Homestead
Project Manager
Charles.Homestead@sgs.com

Date

Print Date: 01/28/2014 2:56:02PM

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

Member of SGS Group



Case Narrative

SGS Client: **Oasis Env/ERM-West, Inc.**
SGS Project: **1140195**
Project Name/Site: **Circle S Grocery 0223618**
Project Contact: **Caryn Orvis**

Refer to sample receipt form for information on sample condition.

14-CGS-01-SS (1140195001) PS

AK102 - The pattern is consistent with a weathered middle distillate.

14-CGS-02-SS (1140195002) PS

AK102 - The pattern is consistent with a weathered gasoline.

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

14-CGS-03-SS (1140195003) PS

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.

14-CGS-06-SS (1140195006) PS

AK102 - The pattern is consistent with a weathered middle distillate.

14-CGS-07-SS (1140195007) PS

AK102 - The pattern is consistent with a weathered middle distillate.

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

14-CGS-08-SS (1140195008) PS

AK102 - The pattern is consistent with a weathered middle distillate.

8270D SIM - LOQs are elevated due to sample dilution. Sample analyzed at a dilution due to matrix interference with internal standards.

14-CGS-10-SS (1140195010) PS

AK102 - The pattern is consistent with a weathered gasoline.

14-CGS-11-SS (1140195011) PS

AK102 - The pattern is consistent with a weathered gasoline.

AK101 - BFB (surrogate) recovery does not meet QC criteria (biased high) due to matrix interference.

1140142002MSD (1196976) MSD / 1140142002MS (1196975) MS

8270D SIM - Surrogate (2-fluorobiphenyl and terphenyl-d14) recovery is outside of QC criteria due to sample dilution.

8270D SIM - MS/MSD recovery for multiple analytes is outside of QC criteria. Refer to LCS for accuracy.

8270D SIM - MS/MSD RPD for phenanthrene, fluoranthene and pyrene does not meet QC criteria.

8270D SIM - Elevated LOQs due to sample dilution. Sample diluted due to dark extract.

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

Print Date: 01/28/2014 2:56:03PM

SGS North America Inc.

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Report of Manual Integrations

<u>Laboratory ID</u>	<u>Client Sample ID</u>	<u>Analytical Batch</u>	<u>Analyte</u>	<u>Reason</u>
8270D SIMS (PAH)				
1140142002	LABREFQC	XMS7861	Benzo(a)Anthracene	RP
1140142002	LABREFQC	XMS7861	Benzo[b]Fluoranthene	RSP
1140142002	LABREFQC	XMS7861	Benzo[k]fluoranthene	RP
1140142002	LABREFQC	XMS7861	Chrysene	RSP
1196975	1140142002MS	XMS7861	Benzo[k]fluoranthene	RP
1196975	1140142002MS	XMS7861	Chrysene	BLC
1196976	1140142002MSD	XMS7861	Benzo[k]fluoranthene	RP
1196976	1140142002MSD	XMS7861	Chrysene	BLC

Manual Integration Reason Code Descriptions

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

All DRO/RRO analysis are integrated per SOP.

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

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

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

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
B	Indicates the analyte is found in a blank associated with the sample.
CCV	Continuing Calibration Verification
CL	Control Limit
D	The analyte concentration is the result of a dilution.
DF	Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
F	Indicates value that is greater than or equal to the DL
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
JL	The analyte was positively identified, but the quantitation is a low estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LOD	Limit of Detection (i.e., 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

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
14-CGS-01-SS	1140195001	01/14/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-02-SS	1140195002	01/14/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-03-SS	1140195003	01/14/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-04-SS	1140195004	01/14/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-05-SS	1140195005	01/15/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-06-SS	1140195006	01/15/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-07-SS	1140195007	01/15/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-08-SS	1140195008	01/15/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-09-SS	1140195009	01/15/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-10-SS	1140195010	01/15/2014	01/15/2014	Soil/Solid (dry weight)
14-CGS-11-SS	1140195011	01/15/2014	01/15/2014	Soil/Solid (dry weight)
TB-01	1140195012	01/14/2014	01/15/2014	Solid/Soil (Wet Weight)
NA	1140195013	01/14/2014	01/15/2014	Soil/Solid (dry weight)

Method

8270D SIMS (PAH)
 AK101
 SW8021B
 AK102
 SM21 2540G

Method Description

8270 PAH SIM Semi-Volatiles GC/MS
 AK101/8021 Combo. (S)
 AK101/8021 Combo. (S)
 Diesel Range Organics (S)
 Percent Solids SM2540G



Detectable Results Summary

Client Sample ID: **14-CGS-01-SS**

Lab Sample ID: 1140195001

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	713	mg/Kg
Benzene	0.201	mg/Kg
Ethylbenzene	1.69	mg/Kg
Gasoline Range Organics	69.5	mg/Kg
o-Xylene	1.85	mg/Kg
P & M -Xylene	5.92	mg/Kg
Toluene	1.46	mg/Kg

Client Sample ID: **14-CGS-02-SS**

Lab Sample ID: 1140195002

Polynuclear Aromatics GC/MS

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0728	mg/Kg
2-Methylnaphthalene	0.128	mg/Kg
Naphthalene	0.142	mg/Kg
Diesel Range Organics	21.7	mg/Kg
Benzene	8.16	mg/Kg
Ethylbenzene	21.2	mg/Kg
Gasoline Range Organics	620	mg/Kg
o-Xylene	34.7	mg/Kg
P & M -Xylene	85.6	mg/Kg
Toluene	85.4	mg/Kg

Client Sample ID: **14-CGS-03-SS**

Lab Sample ID: 1140195003

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	7.52J	mg/Kg
Benzene	0.553	mg/Kg
Ethylbenzene	2.58	mg/Kg
Gasoline Range Organics	70.7	mg/Kg
o-Xylene	4.35	mg/Kg
P & M -Xylene	9.43	mg/Kg
Toluene	3.85	mg/Kg

Client Sample ID: **14-CGS-04-SS**

Lab Sample ID: 1140195004

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzene	0.323	mg/Kg
Ethylbenzene	0.140	mg/Kg
Gasoline Range Organics	5.99	mg/Kg
o-Xylene	0.210	mg/Kg
P & M -Xylene	0.530	mg/Kg
Toluene	1.01	mg/Kg

Detectable Results Summary

Client Sample ID: **14-CGS-05-SS**

Lab Sample ID: 1140195005

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	39.4	mg/Kg
Benzene	0.0146J	mg/Kg
Ethylbenzene	0.0172J	mg/Kg
Gasoline Range Organics	1.76J	mg/Kg
o-Xylene	0.0369J	mg/Kg
P & M -Xylene	0.0764J	mg/Kg
Toluene	0.0634	mg/Kg

Client Sample ID: **14-CGS-06-SS**

Lab Sample ID: 1140195006

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	243	mg/Kg
Benzene	0.0174J	mg/Kg
Gasoline Range Organics	3.23J	mg/Kg
o-Xylene	0.0409J	mg/Kg
P & M -Xylene	0.0689J	mg/Kg
Toluene	0.0672	mg/Kg

Client Sample ID: **14-CGS-07-SS**

Lab Sample ID: 1140195007

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.0890	mg/Kg
2-Methylnaphthalene	0.122	mg/Kg
Fluorene	0.0264J	mg/Kg
Naphthalene	0.0509J	mg/Kg
Phenanthrene	0.0490J	mg/Kg
Diesel Range Organics	93.4	mg/Kg
Benzene	0.448	mg/Kg
Ethylbenzene	10.6	mg/Kg
Gasoline Range Organics	303	mg/Kg
o-Xylene	12.0	mg/Kg
P & M -Xylene	37.3	mg/Kg
Toluene	6.75	mg/Kg

Semivolatile Organic Fuels

Volatile Fuels

Client Sample ID: **14-CGS-08-SS**

Lab Sample ID: 1140195008

Polynuclear Aromatics GC/MS

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
1-Methylnaphthalene	0.141	mg/Kg
2-Methylnaphthalene	0.192	mg/Kg
Fluorene	0.0421J	mg/Kg
Naphthalene	0.0854	mg/Kg
Phenanthrene	0.0839	mg/Kg
Diesel Range Organics	158	mg/Kg
Benzene	0.149	mg/Kg
Ethylbenzene	2.42	mg/Kg
Gasoline Range Organics	63.0	mg/Kg
o-Xylene	2.42	mg/Kg
P & M -Xylene	8.44	mg/Kg
Toluene	1.91	mg/Kg

Semivolatile Organic Fuels

Volatile Fuels

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Detectable Results Summary

Client Sample ID: **14-CGS-09-SS**

Lab Sample ID: 1140195009

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Benzene	0.0209J	mg/Kg
Ethylbenzene	0.0306J	mg/Kg
Gasoline Range Organics	2.99J	mg/Kg
o-Xylene	0.0740	mg/Kg
P & M -Xylene	0.234	mg/Kg
Toluene	0.164	mg/Kg

Client Sample ID: **14-CGS-10-SS**

Lab Sample ID: 1140195010

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	12.8J	mg/Kg
Benzene	0.0482	mg/Kg
Ethylbenzene	0.219	mg/Kg
Gasoline Range Organics	89.1	mg/Kg
o-Xylene	6.00	mg/Kg
P & M -Xylene	4.58	mg/Kg
Toluene	0.288	mg/Kg

Client Sample ID: **14-CGS-11-SS**

Lab Sample ID: 1140195011

Semivolatile Organic Fuels

Volatile Fuels

<u>Parameter</u>	<u>Result</u>	<u>Units</u>
Diesel Range Organics	33.3	mg/Kg
Benzene	2.98	mg/Kg
Ethylbenzene	21.1	mg/Kg
Gasoline Range Organics	762	mg/Kg
o-Xylene	57.1	mg/Kg
P & M -Xylene	107	mg/Kg
Toluene	38.2	mg/Kg



Results of 14-CGS-01-SS

Client Sample ID: 14-CGS-01-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195001
Lab Project ID: 1140195

Collection Date: 01/14/14 12:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 92.8
Location:

Results by Semivolatile Organic Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	713	21.4	6.64	mg/Kg	1		01/27/14 19:20
Surrogates							
5a Androstane	112	50-150		%	1		01/27/14 19:20

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 19:20
Container ID: 1140195001-A

Prep Batch: XXX30553
Prep Method: SW3550C
Prep Date/Time: 01/20/14 13:00
Prep Initial Wt./Vol.: 30.185 g
Prep Extract Vol.: 1 mL

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Results of 14-CGS-01-SS

Client Sample ID: 14-CGS-01-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195001
Lab Project ID: 1140195

Collection Date: 01/14/14 12:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 92.8
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and 4-Bromofluorobenzene.

Batch Information

Analytical Batch: VFC11776, Analytical Method: AK101, Analyst: ST, Analytical Date/Time: 01/25/14 05:03, Container ID: 1140195001-B, Prep Batch: VXX25598, Prep Method: SW5035A, Prep Date/Time: 01/14/14 12:00, Prep Initial Wt./Vol.: 25.463 g, Prep Extract Vol.: 26.8387 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and 1,4-Difluorobenzene.

Batch Information

Analytical Batch: VFC11776, Analytical Method: SW8021B, Analyst: ST, Analytical Date/Time: 01/25/14 05:03, Container ID: 1140195001-B, Prep Batch: VXX25598, Prep Method: SW5035A, Prep Date/Time: 01/14/14 12:00, Prep Initial Wt./Vol.: 25.463 g, Prep Extract Vol.: 26.8387 mL



Results of 14-CGS-02-SS

Client Sample ID: 14-CGS-02-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195002
Lab Project ID: 1140195

Collection Date: 01/14/14 12:30
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.1
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)Anthracene, Benzo[a]pyrene, Benzo[b]Fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenzo[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d] pyrene, Naphthalene, Phenanthrene, Pyrene, and Surrogates (2-Fluorobiphenyl, Terphenyl-d14).

Batch Information

Analytical Batch: XMS7861
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 01/24/14 18:13
Container ID: 1140195002-A

Prep Batch: XXX30567
Prep Method: SW3550C
Prep Date/Time: 01/22/14 15:30
Prep Initial Wt./Vol.: 22.878 g
Prep Extract Vol.: 1 mL

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Results of 14-CGS-02-SS

Client Sample ID: 14-CGS-02-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195002
Lab Project ID: 1140195

Collection Date: 01/14/14 12:30
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.1
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result</u>	<u>Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	21.7		20.9	6.47	mg/Kg	1		01/23/14 12:22
Surrogates								
5a Androstane	97.9		50-150		%	1		01/23/14 12:22

Batch Information

Analytical Batch: XFC11208
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/23/14 12:22
Container ID: 1140195002-A

Prep Batch: XXX30549
Prep Method: SW3550C
Prep Date/Time: 01/17/14 14:20
Prep Initial Wt./Vol.: 30.531 g
Prep Extract Vol.: 1 mL



Results of 14-CGS-02-SS

Client Sample ID: 14-CGS-02-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195002
Lab Project ID: 1140195

Collection Date: 01/14/14 12:30
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.1
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and 4-Bromofluorobenzene.

Batch Information

Analytical Batch: VFC11777
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/27/14 15:49
Container ID: 1140195002-B
Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/14/14 12:30
Prep Initial Wt./Vol: 26.803 g
Prep Extract Vol: 26.5686 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and 1,4-Difluorobenzene.

Batch Information

Analytical Batch: VFC11777
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/27/14 15:49
Container ID: 1140195002-B
Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/14/14 12:30
Prep Initial Wt./Vol: 26.803 g
Prep Extract Vol: 26.5686 mL

Print Date: 01/28/2014 2:56:05PM



Results of 14-CGS-03-SS

Client Sample ID: 14-CGS-03-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195003
Lab Project ID: 1140195

Collection Date: 01/14/14 16:30
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.3
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	7.52 J	21.1	6.55	mg/Kg	1		01/27/14 19:30
Surrogates							
5a Androstane	74.1	50-150		%	1		01/27/14 19:30

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 19:30
Container ID: 1140195003-A

Prep Batch: XXX30553
Prep Method: SW3550C
Prep Date/Time: 01/20/14 13:00
Prep Initial Wt./Vol.: 30.429 g
Prep Extract Vol.: 1 mL



Results of 14-CGS-03-SS

Client Sample ID: 14-CGS-03-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195003
Lab Project ID: 1140195

Collection Date: 01/14/14 16:30
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.3
Location:

Results by Volatile Fuels

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	70.7		5.35	1.61	mg/Kg	1		01/27/14 14:17
Surrogates								
4-Bromofluorobenzene	173	*	50-150		%	1		01/27/14 14:17

Batch Information

Analytical Batch: VFC11777
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/27/14 14:17
Container ID: 1140195003-B

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/14/14 16:30
Prep Initial Wt./Vol.: 26.807 g
Prep Extract Vol: 26.7838 mL

Parameter	Result	Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.553		0.0268	0.00856	mg/Kg	1		01/27/14 14:17
Ethylbenzene	2.58		0.0535	0.0167	mg/Kg	1		01/27/14 14:17
o-Xylene	4.35		0.0535	0.0167	mg/Kg	1		01/27/14 14:17
P & M -Xylene	9.43		0.107	0.0321	mg/Kg	1		01/27/14 14:17
Toluene	3.85		0.0535	0.0167	mg/Kg	1		01/27/14 14:17
Surrogates								
1,4-Difluorobenzene	93.1		72-119		%	1		01/27/14 14:17

Batch Information

Analytical Batch: VFC11777
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/27/14 14:17
Container ID: 1140195003-B

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/14/14 16:30
Prep Initial Wt./Vol.: 26.807 g
Prep Extract Vol: 26.7838 mL

Print Date: 01/28/2014 2:56:05PM

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Results of 14-CGS-04-SS

Client Sample ID: 14-CGS-04-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195004
Lab Project ID: 1140195

Collection Date: 01/14/14 17:15
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.2
Location:

Results by Semivolatile Organic Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10.7 U	21.4	6.65	mg/Kg	1		01/27/14 13:52
Surrogates							
5a Androstane	72.4	50-150		%	1		01/27/14 13:52

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 13:52
Container ID: 1140195004-A

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/14 14:30
Prep Initial Wt./Vol.: 30.031 g
Prep Extract Vol: 1 mL



Results of 14-CGS-04-SS

Client Sample ID: 14-CGS-04-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195004
Lab Project ID: 1140195

Collection Date: 01/14/14 17:15
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.2
Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	5.99	5.52	1.66	mg/Kg	1		01/25/14 01:59
Surrogates							
4-Bromofluorobenzene	102	50-150		%	1		01/25/14 01:59

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 01:59
Container ID: 1140195004-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/14/14 17:15
Prep Initial Wt./Vol.: 26.037 g
Prep Extract Vol: 26.7819 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.323	0.0276	0.00883	mg/Kg	1		01/25/14 01:59
Ethylbenzene	0.140	0.0552	0.0172	mg/Kg	1		01/25/14 01:59
o-Xylene	0.210	0.0552	0.0172	mg/Kg	1		01/25/14 01:59
P & M -Xylene	0.530	0.110	0.0331	mg/Kg	1		01/25/14 01:59
Toluene	1.01	0.0552	0.0172	mg/Kg	1		01/25/14 01:59
Surrogates							
1,4-Difluorobenzene	96.8	72-119		%	1		01/25/14 01:59

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 01:59
Container ID: 1140195004-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/14/14 17:15
Prep Initial Wt./Vol.: 26.037 g
Prep Extract Vol: 26.7819 mL

Print Date: 01/26/2014 2:56:05PM

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Results of 14-CGS-05-SS

Client Sample ID: 14-CGS-05-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195005
Lab Project ID: 1140195

Collection Date: 01/15/14 11:15
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 95.1
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	39.4	20.6	6.39	mg/Kg	1		01/27/14 14:03
Surrogates							
5a Androstane	115	50-150		%	1		01/27/14 14:03

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 14:03
Container ID: 1140195005-A

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/14 14:30
Prep Initial Wt./Vol.: 30.588 g
Prep Extract Vol: 1 mL



Results of 14-CGS-05-SS

Client Sample ID: 14-CGS-05-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195005
Lab Project ID: 1140195

Collection Date: 01/15/14 11:15
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 95.1
Location:

Results by Volatile Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Gasoline Range Organics	1.76 J	5.20	1.56	mg/Kg	1		01/25/14 02:18
Surrogates							
4-Bromofluorobenzene	99.2	50-150		%	1		01/25/14 02:18

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 02:18
Container ID: 1140195005-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:15
Prep Initial Wt./Vol: 26.606 g
Prep Extract Vol: 26.3042 mL

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Benzene	0.0146 J	0.0260	0.00832	mg/Kg	1		01/25/14 02:18
Ethylbenzene	0.0172 J	0.0520	0.0162	mg/Kg	1		01/25/14 02:18
o-Xylene	0.0369 J	0.0520	0.0162	mg/Kg	1		01/25/14 02:18
P & M -Xylene	0.0764 J	0.104	0.0312	mg/Kg	1		01/25/14 02:18
Toluene	0.0634	0.0520	0.0162	mg/Kg	1		01/25/14 02:18
Surrogates							
1,4-Difluorobenzene	96.2	72-119		%	1		01/25/14 02:18

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 02:18
Container ID: 1140195005-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:15
Prep Initial Wt./Vol: 26.606 g
Prep Extract Vol: 26.3042 mL

Print Date: 01/28/2014 2:56:05PM

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Results of 14-CGS-06-SS

Client Sample ID: 14-CGS-06-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195006
Lab Project ID: 1140195

Collection Date: 01/15/14 11:40
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 91.0
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	243	21.8	6.77	mg/Kg	1		01/27/14 12:51
Surrogates							
5a Androstane	96.8	50-150		%	1		01/27/14 12:51

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 12:51
Container ID: 1140195006-A

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/14 14:30
Prep Initial Wt/Vol: 30.223 g
Prep Extract Vol: 1 mL



Results of 14-CGS-06-SS

Client Sample ID: 14-CGS-06-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195006
Lab Project ID: 1140195

Collection Date: 01/15/14 11:40
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 91.0
Location:

Results by Volatile Fuels

Table with 7 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and Surrogates (4-Bromofluorobenzene).

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 00:45
Container ID: 1140195006-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:40
Prep Initial Wt./Vol: 26.912 g
Prep Extract Vol: 27.4336 mL

Table with 7 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,4-Difluorobenzene).

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 00:45
Container ID: 1140195006-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:40
Prep Initial Wt./Vol: 26.912 g
Prep Extract Vol: 27.4336 mL

Print Date: 01/28/2014 2:58:05PM

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Results of 14-CGS-07-SS

Client Sample ID: 14-CGS-07-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195007
Lab Project ID: 1140195

Collection Date: 01/15/14 11:50
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 92.9
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)Anthracene, Benzo[a]pyrene, Benzo[b]Fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenzo[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-c,d] pyrene, Naphthalene, Phenanthrene, Pyrene, 2-Fluorobiphenyl, and Terphenyl-d14.

Batch Information

Analytical Batch: XMS7861
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 01/24/14 18:41
Container ID: 1140195007-A

Prep Batch: XXX30567
Prep Method: SW3550C
Prep Date/Time: 01/22/14 15:30
Prep Initial Wt./Vol.: 22.868 g
Prep Extract Vol.: 1 mL



Results of 14-CGS-07-SS

Client Sample ID: 14-CGS-07-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195007
Lab Project ID: 1140195

Collection Date: 01/15/14 11:50
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 92.9
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	93.4	20.4	6.34	mg/Kg	1		01/23/14 12:43
Surrogates							
5a Androstane	99.4	50-150		%	1		01/23/14 12:43

Batch Information

Analytical Batch: XFC11208
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/23/14 12:43
Container ID: 1140195007-A

Prep Batch: XXX30549
Prep Method: SW3550C
Prep Date/Time: 01/17/14 14:20
Prep Initial Wt./Vol: 31.575 g
Prep Extract Vol: 1 mL

Print Date: 01/28/2014 2:56:05PM

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Results of 14-CGS-07-SS

Client Sample ID: 14-CGS-07-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195007
Lab Project ID: 1140195

Collection Date: 01/15/14 11:50
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 92.9
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result, Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 303, 55.4, 16.6, mg/Kg, 10, 01/27/14 14:35

Surrogates

Table with 8 columns: Parameter, Result, Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene, 273, 50-150, %, 10, 01/27/14 14:35

Batch Information

Analytical Batch: VFC11777
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/27/14 14:35
Container ID: 1140195007-B
Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:50
Prep Initial Wt./Vol: 26.087 g
Prep Extract Vol: 26.8443 mL

Table with 8 columns: Parameter, Result, Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result, Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene, 113, 72-119, %, 1, 01/25/14 02:36

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 02:36
Container ID: 1140195007-B
Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:50
Prep Initial Wt./Vol: 26.087 g
Prep Extract Vol: 26.8443 mL

Analytical Batch: VFC11777
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/27/14 14:35
Container ID: 1140195007-B
Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/15/14 11:50
Prep Initial Wt./Vol: 26.087 g
Prep Extract Vol: 26.8443 mL



Results of 14-CGS-08-SS

Client Sample ID: 14-CGS-08-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195008
Lab Project ID: 1140195

Collection Date: 01/15/14 12:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.4
Location:

Results by Polynuclear Aromatics GC/MS

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists various polynuclear aromatic hydrocarbons and their concentrations.

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Lists 2-Fluorobiphenyl and Terphenyl-d14.

Batch Information

Analytical Batch: XMS7861
Analytical Method: 8270D SIMS (PAH)
Analyst: RTS
Analytical Date/Time: 01/24/14 19:10
Container ID: 1140195008-A

Prep Batch: XXX30567
Prep Method: SW3550C
Prep Date/Time: 01/22/14 15:30
Prep Initial Wt./Vol.: 23.02 g
Prep Extract Vol.: 1 mL

Print Date: 01/28/2014 2:56:05PM

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Results of 14-CGS-08-SS

Client Sample ID: 14-CGS-08-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195008
Lab Project ID: 1140195

Collection Date: 01/15/14 12:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.4
Location:

Results by Semivolatile Organic Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	158	21.2	6.57	mg/Kg	1		01/23/14 13:04
Surrogates							
5a Androstane	96.3	50-150		%	1		01/23/14 13:04

Batch Information

Analytical Batch: XFC11208
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/23/14 13:04
Container ID: 1140195008-A

Prep Batch: XXX30549
Prep Method: SW3550C
Prep Date/Time: 01/17/14 14:20
Prep Initial Wt./Vol.: 30.323 g
Prep Extract Vol.: 1 mL



Results of 14-CGS-08-SS

Client Sample ID: 14-CGS-08-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195008
Lab Project ID: 1140195

Collection Date: 01/15/14 12:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.4
Location:

Results by Volatile Fuels

Table with 7 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and Surrogates (4-Bromofluorobenzene).

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 02:54
Container ID: 1140195008-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 12:00
Prep Initial Wt./Vol.: 28.921 g
Prep Extract Vol.: 26.9021 mL

Table with 7 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,4-Difluorobenzene).

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 02:54
Container ID: 1140195008-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 12:00
Prep Initial Wt./Vol.: 28.921 g
Prep Extract Vol.: 26.9021 mL



Results of 14-CGS-09-SS

Client Sample ID: 14-CGS-09-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195009
Lab Project ID: 1140195

Collection Date: 01/15/14 13:15
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.8
Location:

Results by Semivolatile Organic Fuels

Parameter	Result Qual	LOQ/CL	DL	Units	DF	Allowable Limits	Date Analyzed
Diesel Range Organics	10.6 U	21.1	6.53	mg/Kg	1		01/27/14 13:01
Surrogates							
5a Androstane	90.8	50-150		%	1		01/27/14 13:01

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 13:01
Container ID: 1140195009-A

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/14 14:30
Prep Initial Wt./Vol: 30.047 g
Prep Extract Vol: 1 mL



Results of 14-CGS-09-SS

Client Sample ID: 14-CGS-09-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195009
Lab Project ID: 1140195

Collection Date: 01/15/14 13:15
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.8
Location:

Results by Volatile Fuels

Table with 7 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and Surrogates (4-Bromofluorobenzene).

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 03:13
Container ID: 1140195009-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 13:15
Prep Initial Wt./Vol.: 27.319 g
Prep Extract Vol: 26.4196 mL

Table with 7 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and Surrogates (1,4-Difluorobenzene).

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 03:13
Container ID: 1140195009-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 13:15
Prep Initial Wt./Vol.: 27.319 g
Prep Extract Vol: 26.4196 mL

Print Date: 01/28/2014 2:56:05PM

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Results of 14-CGS-10-SS

Client Sample ID: 14-CGS-10-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195010
Lab Project ID: 1140195

Collection Date: 01/15/14 13:45
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.6
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	12.8 J	21.0	6.51	mg/Kg	1		01/27/14 13:11
Surrogates							
5a Androstane	89.3	50-150		%	1		01/27/14 13:11

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 13:11
Container ID: 1140195010-A

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/14 14:30
Prep Initial Wt/Vol: 30.216 g
Prep Extract Vol: 1 mL



Results of 14-CGS-10-SS

Client Sample ID: **14-CGS-10-SS**
Client Project ID: **Circle S Grocery 0223618**
Lab Sample ID: 1140195010
Lab Project ID: 1140195

Collection Date: 01/15/14 13:45
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 94.6
Location:

Results by Volatile Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Gasoline Range Organics	89.1	5.24	1.57	mg/Kg	1		01/25/14 06:17
Surrogates							
4-Bromofluorobenzene	133	50-150		%	1		01/25/14 06:17

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 06:17
Container ID: 1140195010-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 13:45
Prep Initial Wt./Vol.: 26.695 g
Prep Extract Vol: 26.4491 mL

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Benzene	0.0482	0.0262	0.00838	mg/Kg	1		01/25/14 06:17
Ethylbenzene	0.219	0.0524	0.0163	mg/Kg	1		01/25/14 06:17
o-Xylene	6.00	0.0524	0.0163	mg/Kg	1		01/25/14 06:17
P & M -Xylene	4.58	0.105	0.0314	mg/Kg	1		01/25/14 06:17
Toluene	0.288	0.0524	0.0163	mg/Kg	1		01/25/14 06:17
Surrogates							
1,4-Difluorobenzene	100	72-119		%	1		01/25/14 06:17

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 06:17
Container ID: 1140195010-B

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/15/14 13:45
Prep Initial Wt./Vol.: 26.695 g
Prep Extract Vol: 26.4491 mL

Print Date: 01/28/2014 2:56:05PM

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Results of 14-CGS-11-SS

Client Sample ID: 14-CGS-11-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195011
Lab Project ID: 1140195

Collection Date: 01/15/14 14:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.0
Location:

Results by Semivolatile Organic Fuels

<u>Parameter</u>	<u>Result Qual</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>	<u>DF</u>	<u>Allowable Limits</u>	<u>Date Analyzed</u>
Diesel Range Organics	33.3	21.2	6.58	mg/Kg	1		01/27/14 13:21
Surrogates							
5a Androstane	89.5	50-150		%	1		01/27/14 13:21

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Analyst: HM
Analytical Date/Time: 01/27/14 13:21
Container ID: 1140195011-A

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/14 14:30
Prep Initial Wt./Vol.: 30.369 g
Prep Extract Vol: 1 mL



Results of 14-CGS-11-SS

Client Sample ID: 14-CGS-11-SS
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195011
Lab Project ID: 1140195

Collection Date: 01/15/14 14:00
Received Date: 01/15/14 16:44
Matrix: Soil/Solid (dry weight)
Solids (%): 93.0
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Gasoline Range Organics and 4-Bromofluorobenzene.

Batch Information

Analytical Batch: VFC11777
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/27/14 15:12
Container ID: 1140195011-B

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/15/14 14:00
Prep Initial Wt./Vol.: 28.365 g
Prep Extract Vol.: 26.9774 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows include Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene, and 1,4-Difluorobenzene.

Batch Information

Analytical Batch: VFC11777
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/27/14 15:12
Container ID: 1140195011-B

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/15/14 14:00
Prep Initial Wt./Vol.: 28.365 g
Prep Extract Vol.: 26.9774 mL

Print Date: 01/28/2014 2:56:05PM

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Results of TB-01

Client Sample ID: TB-01
Client Project ID: Circle S Grocery 0223618
Lab Sample ID: 1140195012
Lab Project ID: 1140195

Collection Date: 01/14/14 10:00
Received Date: 01/15/14 16:44
Matrix: Solid/Soil (Wet Weight)
Solids (%):
Location:

Results by Volatile Fuels

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: Gasoline Range Organics, 1.23 U, 2.46, 0.738, mg/Kg, 1, 01/25/14 03:49

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 4-Bromofluorobenzene, 97.5, 50-150, %, 1, 01/25/14 03:49

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Analyst: ST
Analytical Date/Time: 01/25/14 03:49
Container ID: 1140195012-A

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/14/14 10:00
Prep Initial Wt./Vol: 50.803 g
Prep Extract Vol: 25 mL

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Rows: Benzene, Ethylbenzene, o-Xylene, P & M -Xylene, Toluene

Surrogates

Table with 8 columns: Parameter, Result Qual, LOQ/CL, DL, Units, DF, Allowable Limits, Date Analyzed. Row: 1,4-Difluorobenzene, 96.7, 72-119, %, 1, 01/25/14 03:49

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Analyst: ST
Analytical Date/Time: 01/25/14 03:49
Container ID: 1140195012-A

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/14/14 10:00
Prep Initial Wt./Vol: 50.803 g
Prep Extract Vol: 25 mL



Method Blank

Blank ID: MB for HBN 1503062 [SPT/9236]

Blank Lab ID: 1196624

QC for Samples:

1140195002, 1140195007

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

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

Batch Information

Analytical Batch: SPT9236

Analytical Method: SM21 2540G

Instrument:

Analyst: MEV

Analytical Date/Time: 1/16/2014 4:15:00PM

Print Date: 01/28/2014 2:56:07PM

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Duplicate Sample Summary

Original Sample ID: 1140195002

Duplicate Sample ID: 1196625

QC for Samples:

1140195002, 1140195007

Analysis Date: 01/16/2014 16:15

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original ()</u>	<u>Duplicate ()</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	94.1	93.6	0.58	15.00

Batch Information

Analytical Batch: SPT9236

Analytical Method: SM21 2540G

Instrument

Analyst: MEV

Print Date: 01/28/2014 2:56:08PM

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Method Blank

Blank ID: MB for HBN 1503266 [SPT/9237]
Blank Lab ID: 1196708

Matrix: Soil/Solid (dry weight)

QC for Samples:
1140195008

Results by SM21 2540G

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

Batch Information

Analytical Batch: SPT9237
Analytical Method: SM21 2540G
Instrument:
Analyst: MEV
Analytical Date/Time: 1/17/2014 4:56:00PM

Print Date: 01/28/2014 2:56:09PM

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Duplicate Sample Summary

Original Sample ID: 1140195008
Duplicate Sample ID: 1196709
QC for Samples:
1140195008

Analysis Date: 01/17/2014 16:56
Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original ()</u>	<u>Duplicate ()</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	93.4	92.4	1.10	15.00

Batch Information

Analytical Batch: SPT9237
Analytical Method: SM21 2540G
Instrument
Analyst: MEV

Print Date: 01/28/2014 2:56:09PM

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Method Blank

Blank ID: MB for HBN 1503562 [SPT/9238]
Blank Lab ID: 1196765

Matrix: Soil/Solid (dry weight)

QC for Samples:

1140195001, 1140195003, 1140195004, 1140195005, 1140195006, 1140195009, 1140195010, 1140195011

Results by SM21 2540G

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

Batch Information

Analytical Batch: SPT9238
Analytical Method: SM21 2540G
Instrument:
Analyst: MEV
Analytical Date/Time: 1/20/2014 5:05:00PM

Print Date: 01/28/2014 2:56:10PM

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Duplicate Sample Summary

Original Sample ID: 1140194001

Duplicate Sample ID: 1196766

QC for Samples:

1140195001, 1140195003, 1140195004, 1140195005, 1140195006, 1140195009, 1140195010, 1140195011

Analysis Date: 01/20/2014 17:05

Matrix: Soil/Solid (dry weight)

Results by SM21 2540G

<u>NAME</u>	<u>Original ()</u>	<u>Duplicate ()</u>	<u>RPD (%)</u>	<u>RPD CL</u>
Total Solids	98.6	98.8	0.19	15.00

Batch Information

Analytical Batch SPT9238

Analytical Method SM21 2540G

Instrument

Analyst MEV

Print Date 01/28/2014 2:56:11PM

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Method Blank

Blank ID: MB for HBN 1504366 [VXX/25598]
Blank Lab ID: 1197232

Matrix: Soil/Solid (dry weight)

QC for Samples:

1140195001, 1140195004, 1140195005, 1140195006, 1140195007, 1140195008, 1140195009, 1140195010, 1140195012

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	83.4	50-150		%

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 1/24/2014 11:13:00PM

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 1/24/2014 8:00:00AM
Prep Initial Wt/Vol: 50 g
Prep Extract Vol: 25 mL

Print Date: 01/28/2014 2:56:12PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [VXX25598]
Blank Spike Lab ID: 1197235
Date Analyzed: 01/25/2014 00:09

Spike Duplicate ID: LCSD for HBN 1140195 [VXX25598]
Spike Duplicate Lab ID: 1197236
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195001, 1140195004, 1140195005, 1140195006, 1140195007, 1140195008, 1140195009, 1140195010, 1140195012

Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	10.0	9.73	97	10.0	9.59	96	(60-120)	1.50	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25	87.6	88	1.25	89.7	90	(50-150)	2.40	

Batch Information

Analytical Batch: VFC11776
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/24/2014 08:00
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Print Date: 01/26/2014 2:56 12PM

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Method Blank

Blank ID: MB for HBN 1504366 [VXX/25598]
Blank Lab ID: 1197232

Matrix: Soil/Solid (dry weight)

QC for Samples:

1140195001, 1140195004, 1140195005, 1140195006, 1140195007, 1140195008, 1140195009, 1140195010, 1140195012

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg

Surrogates

1,4-Difluorobenzene	96.9	72-119		%
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Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 1/24/2014 11:13:00PM

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 1/24/2014 8:00:00AM
Prep Initial Wt./Vol.: 50 g
Prep Extract Vol: 25 mL



Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [VXX25598]
Blank Spike Lab ID: 1197233
Date Analyzed: 01/24/2014 23:32

Spike Duplicate ID: LCSD for HBN 1140195 [VXX25598]
Spike Duplicate Lab ID: 1197234
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195001, 1140195004, 1140195005, 1140195006, 1140195007, 1140195008, 1140195009, 1140195010, 1140195012

Results by SW8021B

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1.25	1.29	103	1.25	1.35	108	(75-125)	5.10	(< 20)
Ethylbenzene	1.25	1.25	100	1.25	1.31	105	(75-125)	5.30	(< 20)
o-Xylene	1.25	1.24	99	1.25	1.31	105	(75-125)	5.60	(< 20)
P & M -Xylene	2.50	2.50	100	2.50	2.64	106	(80-125)	5.50	(< 20)
Toluene	1.25	1.25	100	1.25	1.32	105	(70-125)	5.10	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25	100	100	1.25	100	100	(72-119)	0.02	

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST

Prep Batch: VXX25598
Prep Method: SW5035A
Prep Date/Time: 01/24/2014 08:00
Spike Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 1.25 mg/Kg Extract Vol: 25 mL



Matrix Spike Summary

Original Sample ID: 1140195006
MS Sample ID: 1197237 MS
MSD Sample ID: 1197238 MSD

Analysis Date: 01/25/2014 0:45
Analysis Date: 01/25/2014 1:04
Analysis Date: 01/25/2014 1:22
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195001, 1140195004, 1140195005, 1140195006, 1140195007, 1140195008, 1140195009, 1140195010, 1140195012

Results by SW8021B

Parameter	Sample	Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.0174J	2.55	2.75	107	2.55	2.74	107	75-125	0.17	(< 20)
Ethylbenzene	0.0280U	2.55	2.63	103	2.55	2.63	103	75-125	0.18	(< 20)
o-Xylene	0.0409J	2.55	2.62	101	2.55	2.62	101	75-125	0.08	(< 20)
P & M -Xylene	0.0689J	5.10	5.31	103	5.10	5.30	102	80-125	0.18	(< 20)
Toluene	0.0672	2.55	2.68	102	2.55	2.67	102	70-125	0.36	(< 20)
Surrogates										
1,4-Difluorobenzene		2.55	2.56	100	2.55	2.56	100	72-119	0.04	

Batch Information

Analytical Batch: VFC11776
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 1/25/2014 1:04:00AM

Prep Batch: VXX25598
Prep Method: AK101 Extraction (S)
Prep Date/Time: 1/24/2014 8:00:00AM
Prep Initial Wt./Vol.: 26.91g
Prep Extract Vol: 25.00mL

Print Date: 01/28/2014 2:56:14PM

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Method Blank

Blank ID: MB for HBN 1504461 [VXX/25599]
Blank Lab ID: 1197284

QC for Samples:
1140195002, 1140195003, 1140195007, 1140195011

Matrix: Soil/Solid (dry weight)

Results by AK101

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Gasoline Range Organics	1.25U	2.50	0.750	mg/Kg
Surrogates				
4-Bromofluorobenzene	86	50-150		%

Batch Information

Analytical Batch: VFC11777
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 1/27/2014 10:54 00AM

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 1/27/2014 8:00:00AM
Prep Initial Wt /Vol: 50 g
Prep Extract Vol: 25 mL

Print Date: 01/28/2014 2:56:15PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [VXX25599]

Blank Spike Lab ID: 1197287

Date Analyzed: 01/27/2014 11:49

Spike Duplicate ID: LCSD for HBN 1140195 [VXX25599]

Spike Duplicate Lab ID: 1197288

Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195002, 1140195003, 1140195007, 1140195011

Results by AK101

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Gasoline Range Organics	10.0	10.1	101	10.0	10.0	100	(60-120)	1.10	(< 20)
Surrogates									
4-Bromofluorobenzene	1.25	87	87	1.25	88.8	89	(50-150)	2.00	

Batch Information

Analytical Batch: VFC11777
Analytical Method: AK101
Instrument: Agilent 7890 PID/FID
Analyst: ST

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/27/2014 08:00
Spike Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol.: 10.0 mg/Kg Extract Vol: 25 mL

Print Date: 01/28/2014 2:56:16PM

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Method Blank

Blank ID: MB for HBN 1504461 [VXX/25599]
Blank Lab ID: 1197284

QC for Samples:
1140195002, 1140195003, 1140195007, 1140195011

Matrix: Soil/Solid (dry weight)

Results by SW8021B

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Benzene	0.00625U	0.0125	0.00400	mg/Kg
Ethylbenzene	0.0125U	0.0250	0.00780	mg/Kg
o-Xylene	0.0125U	0.0250	0.00780	mg/Kg
P & M -Xylene	0.0250U	0.0500	0.0150	mg/Kg
Toluene	0.0125U	0.0250	0.00780	mg/Kg
Surrogates				
1,4-Difluorobenzene	96.5	72-119		%

Batch Information

Analytical Batch: VFC11777
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 1/27/2014 10:54:00AM

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 1/27/2014 8:00:00AM
Prep Initial Wt/Vol.: 50 g
Prep Extract Vol.: 25 mL



Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [VXX25599]
Blank Spike Lab ID: 1197285
Date Analyzed: 01/27/2014 11:12

Spike Duplicate ID: LCSD for HBN 1140195 [VXX25599]
Spike Duplicate Lab ID: 1197286
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195002, 1140195003, 1140195007, 1140195011

Results by SW8021B

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	1.25	1.31	105	1.25	1.34	107	(75-125)	1.80	(< 20)
Ethylbenzene	1.25	1.28	102	1.25	1.30	104	(75-125)	1.80	(< 20)
o-Xylene	1.25	1.27	102	1.25	1.29	104	(75-125)	2.00	(< 20)
P & M -Xylene	2.50	2.56	102	2.50	2.61	105	(80-125)	2.10	(< 20)
Toluene	1.25	1.28	102	1.25	1.30	104	(70-125)	1.60	(< 20)
Surrogates									
1,4-Difluorobenzene	1.25	100	100	1.25	101	101	(72-119)	0.38	

Batch Information

Analytical Batch: VFC11777
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST

Prep Batch: VXX25599
Prep Method: SW5035A
Prep Date/Time: 01/27/2014 08:00
Spike Init Wt./Vol: 1.25 mg/Kg Extract Vol: 25 mL
Dupe Init Wt./Vol: 1.25 mg/Kg Extract Vol: 25 mL

Print Date: 01/28/2014 2:56 17PM

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Matrix Spike Summary

Original Sample ID: 1197289
MS Sample ID: 1197290 MS
MSD Sample ID: 1197291 MSD

Analysis Date: 01/27/2014 12:26
Analysis Date: 01/27/2014 12:45
Analysis Date: 01/27/2014 13:03
Matrix: Solid/Soil (Wet Weight)

QC for Samples: 1140195002, 1140195003, 1140195007, 1140195011

Results by SW8021B

Parameter	Sample	Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Benzene	0.00302U	0.604	0.634	105	0.604	0.635	105	75-125	0.27	(< 20)
Ethylbenzene	0.00605U	0.604	0.617	102	0.604	0.617	102	75-125	0.04	(< 20)
o-Xylene	0.00605U	0.604	0.609	101	0.604	0.611	101	75-125	0.40	(< 20)
P & M -Xylene	0.0121U	1.21	1.23	102	1.21	1.23	102	80-125	0.02	(< 20)
Toluene	0.00459J	0.604	0.624	103	0.604	0.623	103	70-125	0.12	(< 20)

Surrogates

1,4-Difluorobenzene		0.604	0.601	100	0.604	0.603	100	72-119	0.30	
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Batch Information

Analytical Batch: VFC11777
Analytical Method: SW8021B
Instrument: Agilent 7890 PID/FID
Analyst: ST
Analytical Date/Time: 1/27/2014 12:45:00PM

Prep Batch: VXX25599
Prep Method: AK101 Extraction (S)
Prep Date/Time: 1/27/2014 8:00:00AM
Prep Initial Wt./Vol.: 103.54g
Prep Extract Vol.: 25.00mL



Method Blank

Blank ID: MB for HBN 1503162 [XXX/30549]
Blank Lab ID: 1196640

QC for Samples:
1140195002, 1140195007, 1140195008

Matrix: Soil/Solid (dry weight)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	98.4	60-120		%

Batch Information

Analytical Batch: XFC11208
Analytical Method: AK102
Instrument: HP 7890A FID SV E F
Analyst: HM
Analytical Date/Time: 1/23/2014 10:18:00AM

Prep Batch: XXX30549
Prep Method: SW3550C
Prep Date/Time: 1/17/2014 2:20:00PM
Prep Initial Wt./Vol: 30 g
Prep Extract Vol: 1 mL

Print Date: 01/28/2014 2:55:18PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [XXX30549]
Blank Spike Lab ID: 1196641
Date Analyzed: 01/23/2014 11:00

Spike Duplicate ID: LCSD for HBN 1140195
[XXX30549]
Spike Duplicate Lab ID: 1196642
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195002, 1140195007, 1140195008

Results by AK102

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	167	151	109	167	180	108	(75-125)	0.87	(< 20)
Surrogates									
5a Androstane	3.33	106	106	3.33	103	103	(60-120)	3.00	

Batch Information

Analytical Batch: XFC11208
Analytical Method: AK102
Instrument: HP 7890A FID SV E F
Analyst: HM

Prep Batch: XXX30549
Prep Method: SW3550C
Prep Date/Time: 01/17/2014 14:20
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL

Print Date: 01/28/2014 2:56:18PM

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Method Blank

Blank ID: MB for HBN 1503367 [XXX/30553]
Blank Lab ID: 1196731

QC for Samples:
1140195001, 1140195003

Matrix: Soil/Solid (dry weight)

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	91.7	60-120		%

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: HM
Analytical Date/Time: 1/27/2014 3:11:00PM

Prep Batch: XXX30553
Prep Method: SW3550C
Prep Date/Time: 1/20/2014 1:00:00PM
Prep Initial Wt./Vol.: 30 g
Prep Extract Vol: 1 mL

Print Date: 01/28/2014 2:56:19PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [XXX30553]
Blank Spike Lab ID: 1196732
Date Analyzed: 01/27/2014 15:22

Spike Duplicate ID: LCSD for HBN 1140195 [XXX30553]
Spike Duplicate Lab ID: 1196733
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195001, 1140195003

Results by AK102

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	167	189	113	167	192	115	(75-125)	1.60	(< 20)
Surrogates									
5a Androstane	3.33	101	101	3.33	105	105	(60-120)	3.70	

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: HM

Prep Batch: XXX30553
Prep Method: SW3550C
Prep Date/Time: 01/20/2014 13:00
Spike Init Wt /Vol: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt /Vol: 167 mg/Kg Extract Vol: 1 mL



Method Blank

Blank ID: MB for HBN 1503461 [XXX/30554]
Blank Lab ID: 1196750

Matrix: Soil/Solid (dry weight)

QC for Samples:

1140195004, 1140195005, 1140195006, 1140195009, 1140195010, 1140195011

Results by AK102

<u>Parameter</u>	<u>Results</u>	<u>LOQ/CL</u>	<u>DL</u>	<u>Units</u>
Diesel Range Organics	10.0U	20.0	6.20	mg/Kg
Surrogates				
5a Androstane	90.8	60-120		%

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: HM
Analytical Date/Time: 1/27/2014 12:10:00PM

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 1/20/2014 2:30:00PM
Prep Initial Wt./Vol: 30 g
Prep Extract Vol: 1 mL

Print Date: 01/28/2014 2:56:20PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [XXX30554]
Blank Spike Lab ID: 1196751
Date Analyzed: 01/27/2014 12:20

Spike Duplicate ID: LCSD for HBN 1140195 [XXX30554]
Spike Duplicate Lab ID: 1196752
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195004, 1140195005, 1140195006, 1140195009, 1140195010, 1140195011

Results by AK102

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
Diesel Range Organics	167	201	121	167	183	110	(75-125)	9.40	(< 20)
Surrogates									
5a Androstane	3.33	110	110	3.33	97.7	98	(60-120)	12.30	

Batch Information

Analytical Batch: XFC11209
Analytical Method: AK102
Instrument: HP 6890 Series II FID SV D R
Analyst: HM

Prep Batch: XXX30554
Prep Method: SW3550C
Prep Date/Time: 01/20/2014 14:30
Spike Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 167 mg/Kg Extract Vol: 1 mL



Method Blank

Blank ID: MB for HBN 1503965 [XXX/30567]
Blank Lab ID: 1196972

Matrix: Soil/Solid (dry weight)

QC for Samples:
1140195002, 1140195007, 1140195008

Results by 8270D SIMS (PAH)

Parameter	Results	LOQ/CL	DL	Units
1-Methylnaphthalene	0.00250U	0.00500	0.00150	mg/Kg
2-Methylnaphthalene	0.00250U	0.00500	0.00150	mg/Kg
Acenaphthene	0.00250U	0.00500	0.00150	mg/Kg
Acenaphthylene	0.00250U	0.00500	0.00150	mg/Kg
Anthracene	0.00250U	0.00500	0.00150	mg/Kg
Benzo(a)Anthracene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[a]pyrene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[b]Fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[g,h,i]perylene	0.00250U	0.00500	0.00150	mg/Kg
Benzo[k]fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Chrysene	0.00250U	0.00500	0.00150	mg/Kg
Dibenzo[a,h]anthracene	0.00250U	0.00500	0.00150	mg/Kg
Fluoranthene	0.00250U	0.00500	0.00150	mg/Kg
Fluorene	0.00250U	0.00500	0.00150	mg/Kg
Indeno[1,2,3-c,d] pyrene	0.00250U	0.00500	0.00150	mg/Kg
Naphthalene	0.00250U	0.00500	0.00150	mg/Kg
Phenanthrene	0.00250U	0.00500	0.00150	mg/Kg
Pyrene	0.00250U	0.00500	0.00150	mg/Kg
Surrogates				
2-Fluorobiphenyl	73.4	45-105		%
Terphenyl-d14	102	30-125		%

Batch Information

Analytical Batch: XMS7859
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890 Series II MS2 SVOA
Analyst: RTS
Analytical Date/Time: 1/23/2014 4:54:00AM

Prep Batch: XXX30567
Prep Method: SW3550C
Prep Date/Time: 1/22/2014 3:30:00PM
Prep Initial Wt./Vol: 22.5 g
Prep Extract Vol: 1 mL

Print Date: 01/28/2014 2:56:22PM

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Blank Spike Summary

Blank Spike ID: LCS for HBN 1140195 [XXX30567]
Blank Spike Lab ID: 1196973
Date Analyzed: 01/23/2014 05:23

Spike Duplicate ID: LCSD for HBN 1140195 [XXX30567]
Spike Duplicate Lab ID: 1196974
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195002, 1140195007, 1140195008

Results by 8270D SIMS (PAH)

Parameter	Blank Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
	Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	0.0222	0.0147	66	0.0222	0.0147	66	(44-107)	0.15	(< 30)
2-Methylnaphthalene	0.0222	0.0135	61	0.0222	0.0135	61	(45-105)	0.28	(< 30)
Acenaphthene	0.0222	0.0157	71	0.0222	0.0158	71	(45-110)	0.54	(< 30)
Acenaphthylene	0.0222	0.0120	54	0.0222	0.0131	59	(45-105)	8.20	(< 30)
Anthracene	0.0222	0.0148	67	0.0222	0.0171	77	(55-105)	14.10	(< 30)
Benzo(a)Anthracene	0.0222	0.0197	89	0.0222	0.0201	91	(50-110)	2.40	(< 30)
Benzo[a]pyrene	0.0222	0.0116	52	0.0222	0.0155	70	(50-110)	28.80	(< 30)
Benzo[b]Fluoranthene	0.0222	0.0215	97	0.0222	0.0216	97	(45-115)	0.44	(< 30)
Benzo[g,h,i]perylene	0.0222	0.0197	89	0.0222	0.0192	86	(40-125)	2.60	(< 30)
Benzo[k]fluoranthene	0.0222	0.0191	86	0.0222	0.0192	87	(45-125)	0.78	(< 30)
Chrysene	0.0222	0.0205	92	0.0222	0.0209	94	(55-110)	2.10	(< 30)
Dibenzo[a,h]anthracene	0.0222	0.0196	88	0.0222	0.0191	86	(40-125)	2.70	(< 30)
Fluoranthene	0.0222	0.0193	87	0.0222	0.0195	88	(55-115)	1.10	(< 30)
Fluorene	0.0222	0.0175	79	0.0222	0.0179	81	(50-110)	2.20	(< 30)
Indeno[1,2,3-c,d] pyrene	0.0222	0.0194	87	0.0222	0.0189	85	(40-120)	2.50	(< 30)
Naphthalene	0.0222	0.0121	55	0.0222	0.0117	53	(40-105)	3.60	(< 30)
Phenanthrene	0.0222	0.0189	85	0.0222	0.0192	86	(50-110)	1.60	(< 30)
Pyrene	0.0222	0.0184	83	0.0222	0.0188	84	(45-125)	2.20	(< 30)
Surrogates									
2-Fluorobiphenyl	0.0222	76	76	0.0222	78.9	79	(45-105)	3.70	
Terphenyl-d14	0.0222	102	102	0.0222	107	107	(30-125)	4.80	

Batch Information

Analytical Batch: XMS7859
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890 Series II MS2 SVOA
Analyst: RTS

Prep Batch: XXX30567
Prep Method: SW3550C
Prep Date/Time: 01/22/2014 15:30
Spike Init Wt./Vol.: 0.0222 mg/Kg Extract Vol: 1 mL
Dupe Init Wt./Vol.: 0.0222 mg/Kg Extract Vol: 1 mL

Print Date: 01/28/2014 2:56:22PM

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Matrix Spike Summary

Original Sample ID: 1140142002
MS Sample ID: 1196975 MS
MSD Sample ID: 1196976 MSD

Analysis Date: 01/24/2014 16:48
Analysis Date: 01/24/2014 17:16
Analysis Date: 01/24/2014 17:45
Matrix: Soil/Solid (dry weight)

QC for Samples: 1140195002, 1140195007, 1140195008

Results by 8270D SIMS (PAH)

Parameter	Sample	Matrix Spike (mg/Kg)			Spike Duplicate (mg/Kg)			CL	RPD (%)	RPD CL
		Spike	Result	Rec (%)	Spike	Result	Rec (%)			
1-Methylnaphthalene	0.0483U	0.0246	0.0483U	0 *	0.0243	0.00J	0 *	44-107	0.00	(< 30)
2-Methylnaphthalene	0.0483U	0.0246	0.0483U	0 *	0.0243	0.00J	0 *	45-105	0.00	(< 30)
Acenaphthene	0.0483U	0.0246	0.0483U	0 *	0.0243	0.00J	0 *	45-110	0.00	(< 30)
Acenaphthylene	0.0483U	0.0246	0.0483U	0 *	0.0243	0.00J	0 *	45-105	0.00	(< 30)
Anthracene	0.0483U	0.0246	0.0329J	134 *	0.0243	0.00J	0 *	55-105	0.00	(< 30)
Benzo(a)Anthracene	0.0756J	0.0246	0.103	112 *	0.0243	0.0823J	28 *	50-110	22.40	(< 30)
Benzo[a]pyrene	0.133	0.0246	0.146	51	0.0243	0.137	15 *	50-110	6.30	(< 30)
Benzo[b]Fluoranthene	0.172	0.0246	0.182	40 *	0.0243	0.162	-41 *	45-115	11.50	(< 30)
Benzo[g,h,i]perylene	0.176	0.0246	0.180	12 *	0.0243	0.167	-35 *	40-125	6.60	(< 30)
Benzo[k]fluoranthene	0.0385J	0.0246	0.0904J	211 *	0.0243	0.0691J	125	45-125	26.70	(< 30)
Chrysene	0.0725J	0.0246	0.182	446 *	0.0243	0.155	337 *	55-110	16.40	(< 30)
Dibenzo[a,h]anthracene	0.0446J	0.0246	0.0617J	70	0.0243	0.0604J	65	40-125	2.10	(< 30)
Fluoranthene	0.140	0.0246	0.222	334 *	0.0243	0.146	24 *	55-115	41.50	*(< 30)
Fluorene	0.0483U	0.0246	0.0301J	122 *	0.0243	0.00J	0 *	50-110	0.00	(< 30)
Indeno[1,2,3-c,d] pyrene	0.0838J	0.0246	0.0967	53	0.0243	0.0895J	23 *	40-120	7.70	(< 30)
Naphthalene	0.0483U	0.0246	0.0483U	0 *	0.0243	0.00J	0 *	40-105	0.00	(< 30)
Phenanthrene	0.0853J	0.0246	0.112	107	0.0243	0.0795J	-24 *	50-110	33.70	*(< 30)
Pyrene	0.139	0.0246	0.193	222 *	0.0243	0.138	-3 *	45-125	33.30	*(< 30)
Surrogates										
2-Fluorobiphenyl		0.0246	0.0331	135 *	0.0243	0.0319	131 *	45-105	3.80	
Terphenyl-d14		0.0246	0.0321	131 *	0.0243	0.0325	133 *	30-125	1.00	

Batch Information

Analytical Batch: XMS7861
Analytical Method: 8270D SIMS (PAH)
Instrument: HP 6890 Series II MS2 SVOA
Analyst: RTS
Analytical Date/Time: 1/24/2014 5:16:00PM

Prep Batch: XXX30567
Prep Method: Sonication Extraction Soil 8270 PAH SIM
Prep Date/Time: 1/22/2014 3:30:00PM
Prep Initial Wt./Vol.: 22.70g
Prep Extract Vol.: 3.50mL

Print Date: 01/28/2014 2:56:23PM

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

Page 1 of 2

Section 1

CLIENT: *ERM*

CONTACT: *CARYN DRVIS* PHONE NO: *204-4442*

PROJECT NAME: *CIRCLE S GROCERY* PROJECT PWSID/ PERMIT#: *0223618*

REPORTS TO: *C. DRVIS* E-MAIL: *caryn.drvis@erm.com*

INVOICE TO: *ERM* QUOTE #: *0223618* P.O. #: *0223618*

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	#	Type	CONTAINER	Section 3	Section 4	DOD Project?	Yes	No	Data Deliverable Requirements:
(1) A-B	14-CGS-01-SS	1/14/14	1200	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(2) A-B	14-CGS-02-SS	1/14/14	1230	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(3) A-B	14-CGS-03-SS	1/14/14	1630	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(4) A-B	14-CGS-04-SS	1/14/14	1715	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(5) A-B	14-CGS-05-SS	1/15/14	1115	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(6) A-B	14-CGS-06-SS	1/15/14	1140	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(7) A-B	14-CGS-07-SS	1/15/14	1150	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(8) A-B	14-CGS-08-SS	1/15/14	1200	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(9) A-B	14-CGS-09-SS	1/15/14	1315	SS	2	C	2	MTX EPA 8221B	DRB AK102				
(10) A-B	14-CGS-10-SS	1/15/14	1345	SS	2	C	2	MTX EPA 8221B	DRB AK102				

Section 3

Relinquished By: (1) *Sarah Christensen* Received By: _____

Relinquished By: (2) _____ Received By: _____

Relinquished By: (3) _____ Received By: _____

Relinquished By: (4) _____ Received By: _____

Section 4

Temp Blank °C: *1.5° #242*

Chain of Custody Seal: (Circle) *INTACT* *15, 1RS* *BROKEN* *ABSENT*

(See attached Sample Receipt Form)

Section 5

Requested Turnaround Time and/or Special Instructions:





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CLIENT: ERM

CONTACT: Caryn Drvis
PHONE NO: 204-4412

PROJECT NAME: Circle 5
PWSID/ PERMIT#: Groceries

REPORTS TO: C. drvis
E-MAIL: Caryn.drvis@erm.com

INVOICE TO: ERM
QUOTE #: P.O. #: 0233618

RESERVED for lab use

SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE
11A-B 14-CGS-11-SS	1/16/14	1000-1400	SS
12A TB-DI	1/14/14	1000	TB

CONTAINERS

Type	MeOH	MeOH	MeOH	Preservative	REMARKS/ LOC ID
C = COMP	X EPA 822B	X EPA 822B	X EPA 822B		
G = GRAB					
M = Multi					
Incr = Incremental					
Soils = Soils					
#					
2					
1					

Section 2

Section 3

Section 4

Section 5

Relinquished By: (1) Sarah Christensen

Relinquished By: (2)

Relinquished By: (3)

Relinquished By: (4)

Received By:

Temp Blank °C: 1.5° # 242
or Ambient []

Chain of Custody Seal: (Circle)
INTACT (F) 1RS
BROKEN ABSENT

Requested Turnaround Time and/or Special Instructions:

Data Deliverable Requirements:

Temp Blank °C: 1.5° # 242
or Ambient []

Chain of Custody Seal: (Circle)
INTACT (F) 1RS
BROKEN ABSENT

Requested Turnaround Time and/or Special Instructions:

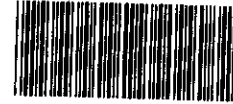
Data Deliverable Requirements:

Temp Blank °C: 1.5° # 242
or Ambient []

Chain of Custody Seal: (Circle)
INTACT (F) 1RS
BROKEN ABSENT

Requested Turnaround Time and/or Special Instructions:

Data Deliverable Requirements:



SAMPLE RECEIPT FORM

Review Criteria:	Condition:	Comments/Action Taken:
Were custody seals intact? Note # & location, if applicable. COC accompanied samples?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	1F/15
Temperature blank compliant* (i.e., 0-6°C after CF)? <i>* Note: Exemption permitted for chilled samples collected less than 8 hours ago.</i> Cooler ID: _____ @ _____ w/ Therm.ID: 242 Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ Cooler ID: _____ @ _____ w/ Therm.ID: _____ <i>Note: If non-compliant, use form FS-0029 to document affected samples/analyses.</i> If samples are received <u>without</u> a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank <u>nor</u> cooler temp can be obtained, note "ambient" or "chilled." If temperature(s) <0°C, were all sample containers ice free?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	
Delivery method (specify all that apply): USPS Alert Courier C&D Delivery AK Air Lynden Carlile ERA PenAir FedEx UPS NAC Other: → For WO# with airbills, was the WO# & airbill info recorded in the Front Counter eLog?	Client Note ABN/tracking # See Attached or N/A <input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	
→ For samples received with payment, note amount (\$) and cash / check / CC (circle one) or note: → For samples received in FBKS, ANCH staff will verify all criteria are reviewed.		<input checked="" type="radio"/> N/A SRF Initiated by: <u>FAT</u> <input checked="" type="radio"/> N/A
Were samples received within hold time? <i>Note: Refer to form F-083 "Sample Guide" for hold time information.</i> Do samples match COC* (i.e., sample IDs, dates/times collected)? <i>* Note: Exemption permitted if times differ <1hr; in that case, use times on COC.</i> Were analyses requested unambiguous?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
Were samples in good condition (no leaks/cracks/breakage)? Packing material used (specify all that apply): Bubble Wrap Separate plastic bags Vermiculite <u>Other:</u>	<input checked="" type="radio"/> Yes No N/A	Carobured Box
Were all VOA vials free of headspace (i.e., bubbles ≤6 mm)? Were all soil VOAs field extracted with MeOH+BFB?	<input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A <input checked="" type="radio"/> Yes No N/A	
Were proper containers (type/mass/volume/preservative*) used? <i>* Note: Exemption permitted for waters to be analyzed for metals.</i> Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	
For special handling (e.g., "MP" or foreign soils, lab filter, limited volume, Ref Lab), were bottles/paperwork flagged (e.g., sticker)?	<input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	
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)?	<input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A <input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	
For RUSH/SHORT Hold Time, were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	<input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	
For SITE-SPECIFIC QC, e.g. BMS/BMSD/BDUP, were containers / paperwork flagged accordingly?	<input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	
For any question answered "No," has the PM been notified and the problem resolved (or paperwork put in their bin)?	<input checked="" type="radio"/> Yes No <input checked="" type="radio"/> N/A	SRF Completed by: <u>FAT</u> PM = <u>CGH</u> N/A
Was PEER REVIEW of sample numbering/labeling completed?	<input checked="" type="radio"/> Yes No N/A	Peer Reviewed by: N/A

Additional notes (if applicable):

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

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1140195001-A	No Preservative Required	OK			
1140195001-B	Methanol field pres. 4 C	OK			
1140195002-A	No Preservative Required	OK			
1140195002-B	Methanol field pres. 4 C	OK			
1140195003-A	No Preservative Required	OK			
1140195003-B	Methanol field pres. 4 C	OK			
1140195004-A	No Preservative Required	OK			
1140195004-B	Methanol field pres. 4 C	OK			
1140195005-A	No Preservative Required	OK			
1140195005-B	Methanol field pres. 4 C	OK			
1140195006-A	No Preservative Required	OK			
1140195006-B	Methanol field pres. 4 C	OK			
1140195007-A	No Preservative Required	OK			
1140195007-B	Methanol field pres. 4 C	OK			
1140195008-A	No Preservative Required	OK			
1140195008-B	Methanol field pres. 4 C	OK			
1140195009-A	No Preservative Required	OK			
1140195009-B	Methanol field pres. 4 C	OK			
1140195010-A	No Preservative Required	OK			
1140195010-B	Methanol field pres. 4 C	OK			
1140195011-A	No Preservative Required	OK			
1140195011-B	Methanol field pres. 4 C	OK			
1140195012-A	Methanol field pres. 4 C	OK			

Container Condition Glossary

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.

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APPENDIX F

ADEC Laboratory Data Review Checklist

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Laboratory Data Review Checklist

Completed by:	Melissa Pike		
Title:	Senior Environmental Scientist	Date:	Feb 10, 2014
CS Report Name:	Circle S Grocery, Site Investigation Report, Chugiak, Alaska	Report Date:	February 2014
Consultant Firm:	ERM Alaska, Inc.		
Laboratory Name:	SGS North America Inc	Laboratory Report Number:	1140195
ADEC File Number:	2106.26.004	ADEC RecKey Number:	

1. Laboratory

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

Yes No NA (Please explain.) Comments:

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

Yes No NA (Please explain) Comments:

No samples were transferred or subcontracted.

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 ($4^{\circ} \pm 2^{\circ} \text{C}$)?

Yes No NA (Please explain) Comments:

One sample cooler was received at 1.5°C. No samples were qualified due to temperature.

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:

Samples arrived in good condition.

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

Yes No NA (Please explain) Comments:

There were no discrepancies.

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

Comments:

Data quality and usability was not affected with respect to the laboratory sample receipt documentation.

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:

c. Were all corrective actions documented?

Yes No NA (Please explain) Comments:

There were no corrective actions.

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

Comments:

Data quality and usability is not affected with respect to the case narrative.

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? (Please explain)

Comments:

Data quality and usability is not affected with respect to the reported sample results.

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:

NA. All method blank results were not detected at the MDL.

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

Yes No NA (Please explain) Comments:

NA. All method blank results were not detected at the MDL.

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

Data quality and usability is not affected with respect to the reported method blank results.

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:

There are no inorganic or metal analyses.

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:

MS/MSD %R were outside of the range in 8270-SIM analysis. Refer to QAR for additional information.

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/DMSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes No NA (Please explain) Comments:

MS/MSD RPDs were outside of the range in 8270-SIM analysis. Refer to QAR for additional information.

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

Comments:

Refer to QAR for additional information.

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

Yes No NA (Please explain) Comments:

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

Data quality and usability is not affected. LCS/LCSD were within limits. Refer to QAR for additional information.

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:

GRO surrogate recoveries in several samples were high. Refer to QAR for additional information.

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:

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

Data quality and usability is somewhat affected, with some results qualified as estimated (JS).

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:

iii. All results less than PQL?

Yes No NA (Please explain.)

Comments:

iv. If above PQL, what samples are affected?

Comments:

NA. All trip blank results were less than PQL.

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

Comments:

Data quality and usability is not affected with respect to the reported trip blank results.

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)

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

Where R_1 = Sample Concentration

R_2 = Field Duplicate Concentration

Yes No NA (Please explain.)

Comments:

Refer to QAR for additional information.

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

Yes No NA (Please explain.)

Comments:

Data quality and usability was somewhat affected, with results qualified as estimated (JD).

f. Decontamination or Equipment Blank (if applicable)

Yes No NA (Please explain)

Comments:

Decontamination and equipment blanks were not required. All sampling equipment was disposable.

i. All results less than PQL?

Yes No NA (Please explain)

Comments:

Decontamination and equipment blanks were not required. All sampling equipment was disposable.

ii. If above PQL, what samples are affected?

Comments:

NA. Decontamination and equipment blanks were not required. All sampling equipment was disposable.

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

Comments:

NA. Decontamination and equipment blanks were not required. All sampling equipment was disposable.

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

a. Defined and appropriate?

Yes No NA (Please explain)

Comments:

Refer to laboratory report for additional qualifiers.



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