

**Additional Site Characterization
3607 & 3609 Spenard Road
Former Tesoro Olson Gas Services Store #1
Anchorage, Alaska**

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DRAFT

Submitted To:
**Alaska Department of Environmental Conservation
Contaminated Sites, Reuse & Redevelopment Program**
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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AK	Alaska Method
AS	Air Sparge
bgs	Below Ground Surface
BGES	Braunstein Geological and Environmental Services, Inc.
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CCIC	Cleanup Complete with Institutional Controls
COBC	Compliance Order by Consent
COC	Contaminant of Concern
CSM	Conceptual Site Model
Discovery	Discovery Drilling, Inc.
DQO	Data Quality Objective
DRO	Diesel Range Organics
Emerald	Emerald Alaska
Eurofins	Eurofins/Air Toxics, Inc.
EPA	Environmental Protection Agency
EPH	Extractable Petroleum Hydrocarbons
ESA	Environmental Site Assessment
FID	Flame Ionization Detector
GEET	Gilfilian Engineering & Environmental Testing, Inc.
GRO	Gasoline Range Organics
IDW	Investigation Derived Waste
L/min	Liter per minute
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
LRDC	Laboratory Data Review Checklist
LUST	Leaking Underground Storage Tank
MCL	Maximum Contaminant Level

ACRONYMS AND ABBREVIATIONS (continued)

mg/kg	Milligram per kilogram
mg/L	Milligram per liter
MOA	Municipality of Anchorage
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MWH	Montgomery Watson Harza Americas
mV	Millivolt
NTU	Nephelometric Turbidity Units
ORP	Oxidation Reduction Potential
PAH	Polynuclear Aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
PID	Photoionization Detector
ppm	part per million
PVC	Polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RRO	Residual Range Organics
SGS	SGS North America, Inc.
SIM	Selective Ion Mode
SVE	Soil Vapor Extraction
TBA	Targeted Brownfield Assessment
µg/L	Microgram per liter
µg/m ³	Microgram per cubic meter
USGS	United States Geological Society
UST	Underground Storage Tank
VOC	Volatile Organic Compound
VPH	Volatile Petroleum Hydrocarbons

**ADDITIONAL SITE CHARACTERIZATION
3607 & 3609 SPENARD ROAD
FORMER TESORO OLSON GAS SERVICES STORE #1
ANCHORAGE, ALASKA**

1.0 INTRODUCTION

This report presents the results of our additional site characterization activities performed at the Former Tesoro Olson Gas Services Store #1 located at 3607 & 3609 Spenard Road in Anchorage, Alaska (Property). The Alaska Department of Environmental Conservation (ADEC) File Number for this site is 2100.26.072. The project purpose is to address data gaps to facilitate a potential Property purchase, and otherwise continue progress towards an eventual Cleanup Complete designation, with or without institutional controls.

Authorization to proceed was received on August 6, 2012 from Mr. Dennis Harwood of the ADEC in Notice to Proceed Number 18-4002-12-052. The project was conducted in general accordance with our ADEC-approved work plan, dated February 15, 2013.

2.0 SITE AND PROJECT DESCRIPTION

2.1 Location and Legal Description

The street address for the Property is 3607 and 3609 Spenard Road, Anchorage, Alaska. The Property, located in a commercial/residential area, comprises one parcel encompassing 1.73 acres. A Vicinity Map showing the Property and surrounding area is included as Figure 1. Figure 2 is a site plan depicting general site features of the Property and adjacent parcels.

The Property is located in the southeast $\frac{1}{4}$ of Section 25, Township 13 North, Range 4 West, Seward Meridian, Alaska, as referenced by the United States Geological Society (USGS) Anchorage A-8 NW quadrangle. According to the Municipality of Anchorage (MOA) Assessor's office, the legal description of the Property is a portion of the north $\frac{1}{2}$ of the northeast $\frac{1}{4}$ of the northwest $\frac{1}{4}$ of the southeast $\frac{1}{4}$ of Section 25, Township 13 North, Range 4 West, Anchorage, Alaska. MOA identifies the Property as Parcel No. 010-113-48-000.

2.2 Background

Tesoro Olson Gas Services Store #1 began operation as a fueling station in approximately 1964. At the time, nine underground storage tanks (USTs) ranging in capacity from 500 gallons to

12,000 gallons were used on the Property. The USTs reportedly contained diesel; unleaded, premium, and regular gasoline; and used oil. During construction in the summer of 1987, a citizen complained of gasoline odors near the Property. In October 1988, the ADEC conducted a site inspection of the Property and noted that the Property was “messy” and could have leaking underground storage tanks (LUSTs) on site. Tank tightness tests conducted in November 1990 indicated that the tanks were not leaking. According to ADEC contaminated sites database, on January 3, 1993, the service station was closed and the USTs were emptied. In June 1993, an Environmental Protection Agency (EPA) representative inspected the Property and found that five USTs were out of compliance due to dormancy.

A UST site assessment was conducted by Gilfilian Engineering & Environmental Testing, Inc. (GEET) in 1995, with the results presented in their October 17, 1995 report, *UST Site Assessment Report for Olson’s Gas Service #1*. The entire UST system, including nine USTs and associated piping and dispensers, was removed between September 13 and 19, 1995. Figure 2 shows the approximate locations of the former USTs. The UST assessment report stated that the observed surface contamination is “likely due to someone dumping motor oil in the hole of the concrete pad.” Analytical soil samples collected beneath each of the eight gasoline and diesel USTs and dispensers contained concentrations of petroleum hydrocarbons exceeding ADEC cleanup criteria applicable at the time. Approximately 100 tons of petroleum-impacted soil were excavated during the UST removal effort and were thermally treated at an off-site facility.

Several site characterization and/or cleanup actions were conducted between 1996 and 2003. The monitoring wells installed during this period are shown on Figure 3, and the approximate extent of the 2001 impacted soil excavation is shown on Figure 2. Figure 4 presents a visual summary of locations where petroleum hydrocarbon compounds were measured at concentrations greater than applicable ADEC cleanup levels. The following paragraphs provide summaries of these efforts, along with other relevant field projects in the immediate Property vicinity.

July 1996 release investigation (GEET). A release investigation was conducted by GEET with the results presented in their July 10, 1996 report, *Release Investigation: Installation of MW-1, MW-2, and MW-3, Olson’s Gas Service #1*. Three groundwater monitoring wells, designated MW-1 through MW-3, were installed and sampled. The approximate well locations are shown on Figures 2 and 3. Analytical soil samples were collected near the groundwater table interface at 11 feet below ground surface (bgs) in each monitoring well boring. Only the soil sample collected from the MW-3 boring contained concentrations that exceed the current ADEC Method 2 cleanup levels, including 1,000 milligrams per kilogram (mg/kg) volatile petroleum

hydrocarbons (VPH, the equivalent to the current gasoline range organic [GRO] test), 55.4 mg/kg benzene, and 526 mg/kg total benzene, toluene, ethylbenzene, and xylenes (BTEX). In contrast, the initial groundwater samples from each of the three wells contained concentrations of at least one compound greater than current ADEC Table 3 cleanup levels. The highest levels of volatile compounds were measured in the sample from MW-3, which contained 4.04 milligrams per liter (mg/L) extractable petroleum hydrocarbons (EPH, the equivalent to the current diesel range organics [DRO] test), 231 mg/L VPH, and 35.2 mg/L benzene. The groundwater sample from MW-1 did not contain detectable concentrations of VPH or BTEX, but contained 47.4 mg/L EPH. Results of the release investigation indicated the soil and/or groundwater is impacted at each of the three monitoring well locations.

1997 Release Investigation (GEET). An additional release investigation and limited corrective actions were conducted by GEET in 1997, with the results presented in their July 17, 1997 report, *Release Investigation and Corrective Action Plan Conducted at Olson's Gas Service #1*. The release investigation included the installation and sampling of three additional groundwater monitoring wells, designated MW-4, MW-5, and MW-6. The soil samples did not contain concentrations of petroleum hydrocarbons exceeding the ADEC cleanup criteria. The three groundwater samples contained diesel range organics (DRO) concentrations ranging from 1.07 mg/L to 4.09 mg/L. The groundwater samples did not contain detectable concentrations of GRO. In addition, the sample from MW-5 was the only sample to contain a benzene concentration (0.00657 mg/L) exceeding the ADEC cleanup level. The limited corrective action activities focused on excavation of the shallow contaminated soil and installation of a passive bioventing system to treat petroleum hydrocarbon impacted soil remaining at the site.

1998 Free-Phase Product Recovery (GEET). Free product recovery was conducted by GEET in 1998, with the results presented in their April 9, 1998 letter report, *Free Product Recovery, Olson's Gas Service #1, ADEC UST Facility I.D. #2288*. Free product was observed for the first time in MW-3 during the February 1998 quarterly monitoring event. The report indicates approximately 2.5 inches of product was recovered using disposable bailers.

2001 Water Well Search (GEET). A water well search was conducted by GEET in 2001, with the results presented in their June 1, 2001 report, *Well Search, Olson's Gas Service #1, 3607 Spenard Road, Anchorage, Alaska, ADEC UST Facility #2288*. Five properties were identified with potential water supply wells within the search radius, including an on-Property water well. Private wells were identified at 3801 McCain Loop, 1204 Wilshire Avenue, 3704 Wilson Street and 3609 Spenard Road (the Property). In addition, a well serving two homes was identified at 3740 McCain Loop.

2001 Impacted Soil Removal (GEET). Additional contaminated soil excavation was conducted by GEET in 2001, with the results presented in their October 17, 2001 report, *Excavation of Contaminated Soil, Olson's Gas Service #1, 3609 Spenard Road, Anchorage, Alaska, ADEC UST Facility #2288*. The investigation and remedial activities included the excavation and off-site treatment of 1,120 tons of contaminated soil, the installation and sampling of MW-7, and the installation of four access manholes and piping for future remediation wells. The former UST excavation was limited to the north due to the presence of the existing structure. Confirmation soil samples collected from the excavations indicate contaminated soil above ADEC cleanup levels (up to 28.6 mg/kg benzene, 260 mg/kg toluene, 84.1 mg/kg ethylbenzene, 1,100 mg/kg xylenes, 8,410 mg/kg GRO, and 2,520 mg/kg DRO) remained on site - primarily at the groundwater table interface (12 feet bgs) and beneath the existing structure. Soil and groundwater samples collected from MW-7 did not contain concentrations of petroleum hydrocarbons exceeding the ADEC cleanup levels.

2003 Release Investigation (Montgomery Watson Harza Americas). Additional release investigation and installation of an air sparge (AS) and soil vapor extraction (SVE) system were conducted by Montgomery Watson Harza Americas (MWH) in 2003, with the results presented in their May 2003 report, *March 2003 Release Investigation/Remediation System Installation and April 2003 Monitoring Event Report*. The release investigation entailed installing and sampling two additional monitoring wells, MW-8 and MW-9, and sampling the existing site monitoring wells. Soil samples collected from the groundwater table interface at about 10 feet bgs from both borings did not contain detectable concentrations of petroleum hydrocarbon constituents. However, the groundwater sample collected from MW-9 contained 0.631 mg/L benzene which exceeds the ADEC cleanup level. Groundwater samples collected from MW-1 through MW-5 at that time contained concentrations of benzene, toluene, ethylbenzene, xylenes, GRO and/or DRO exceeding the ADEC cleanup levels. Three combination AS and SVE wells, designated AS/SVE1 through AS/SVE3, were installed in 2002 as part of an air sparging pilot test. Three additional AS/SVE wells, designated AS/SVE4 through AS/SVE6, were installed during the 2003 release investigation efforts. The approximate locations of the AS/SVE wells are shown on Figure 2. Soil and groundwater samples were not collected from the AS/SVE borings. The report states "obvious evidence of soil and ground water contamination was detected during the installation of the AS/SVE wells."

Periodic Groundwater Monitoring (various). Groundwater monitoring occurred on at least 18 discrete occasions between 1996 and 2009. Prior to the May 2013 field activities, the most recent groundwater sampling appears to have been conducted by Design Build Consulting in June 2009, with the results presented in their July 26, 2009 report, *June 2009 Groundwater*

Monitoring Event Report for Olson's Gas Service #1 [Former], 3607 Spenard Road, Anchorage, Alaska, ADEC UST Facility #2288, ADEC File #2100.26.072. Groundwater samples were collected from each of the nine monitoring wells except for Wells MW-1, MW-6, and MW-8. Concentrations of contaminants exceeding ADEC Table C cleanup levels were measured in groundwater samples from MW-2 (0.007 mg/L benzene), MW-3 (0.126 mg/L benzene, 1.64 mg/L ethylbenzene, 49.0 mg/L GRO, and 3.85 mg/L DRO), MW-4 (0.470 mg/L benzene and 1.72 mg/L GRO) and MW-5 (0.173 mg/L benzene and 6.14 mg/L GRO). No target contaminants were detected at concentrations exceeding ADEC cleanup levels in MW-7 and MW-9. Drinking water samples were collected from two active water wells, one located on the Property and the other off site at 3801 McCain Loop. No detectable concentrations of contaminants were measured in the two drinking water well samples.

2011 Limited Site Characterization (Braunstein Geological and Environmental Services, Inc.).

Braunstein Geological and Environmental Services, Inc. (BGES) conducted a limited site characterization at 3608 Spenard Road (also referred to as 3604 Spenard Road), located west of the subject property across Spenard Road. The results are discussed in the background of BGES's March 7, 2011 letter to Cook Inlet Housing Authority. The characterization included collecting and advancing four borings, collecting screening-level water samples from the borings, and collecting one soil sample. The water samples collected from three borings along the eastern property boundary (Borings GRB-1, GRB-2, and GRB-4) each contained concentrations of benzene greater than the ADEC cleanup level, with results ranging from 0.0107 mg/L in Boring GRB-2 to 0.139 mg/L in Boring GRB-1. The locations of the January 2011 borings are shown on Figure 1. One soil sample (SS-1), collected from 9 to 12 feet bgs in Boring GRB-1, did not contain "contaminant concentrations" greater than the ADEC cleanup level, although the letter does not specify for which analysis the soil and groundwater samples were tested. One of the four borings (GRB-3) was advanced along the northern property boundary to assess potential on-site contaminant migration from another contaminated site to the north. The results of the screening-level water sample collected from Boring GRB-3 were less than the ADEC cleanup level. BGES concluded that the groundwater contamination was likely the result of migration from the former Olson's Gas Services Store #1 site.

2012 Phase I Environmental Site Assessment (Shannon & Wilson, Inc.). The results of Shannon & Wilson's Phase I Environmental Site Assessment (ESA) are presented in our September 2012 report, *Phase I Environmental Site Assessment, Tesoro - Olson Gas Services Store #1, 3607 and 3609 Spenard Road, Anchorage, Alaska*. In addition to the former UST system that has been the subject of previous characterization and remedial actions, the Phase I ESA identified multiple potential sources of contamination including floor drains,

abandoned/existing hydraulic lifts, vehicles, underground garage, fuel storage tanks, 55-gallons drums, and chemical containers. Potential impact to the Property's soil and groundwater from these potential sources was apparently not investigated as part of prior environmental assessments.

2012 Additional Environmental Assessment (Shannon & Wilson, Inc.). Shannon & Wilson's 2012 document, *Additional Environmental Assessment, 3607 and 3609 Spenard Road, Anchorage, Alaska* contains a summary of environmental site assessment and cleanup conducted at the Property. The document also provides an analysis of corrective action alternatives that may be implemented to progress the site towards Cleanup Complete with Institutional Control (CCIC) status, and identifies data gaps that may affect CCIC status.

2.3 Project Purpose and Objective

The project purpose is to address data gaps to facilitate a potential Property purchase, and otherwise continue progress towards an eventual Cleanup Complete designation, with or without institutional controls. The specific data collection objectives are to conduct a limited investigation of potential contaminant sources identified by the 2012 Phase I ESA, delineate the current extent of the impacted groundwater plume, investigate the vertical extent of impacted soil and groundwater, and collect soil gas samples. The data are used to assess the apparent extent of contamination, update the conceptual site model (CSM), and develop recommendations to focus additional characterization efforts to be conducted under a potential Targeted Brownfields Assessment (TBA). The data may also be used to evaluate the need for remedial action, refine the preliminary remedial action alternatives analysis and cost estimate contained in Shannon & Wilson's 2012 *Additional Environmental Assessment* document, and to negotiate a Prospective Purchaser Agreement (PPA) with the ADEC, although these tasks are not covered under the scope of the present project.

2.4 Project Description

Field activities were conducted between April 8 and May 16, 2013 and consisted of utility locate meetings; advancing six soil borings and collecting soil samples; installing and developing three groundwater monitoring wells; sampling three new and six existing groundwater monitoring wells and three drinking water wells; installing and sampling six soil gas points (three sets of two nested points); laboratory analyses of soil, groundwater, drinking water, and soil gas samples; a level-loop survey of the groundwater monitoring wells; and disposal of investigation derived waste (IDW).

Discovery Drilling Inc. (Discovery) of Anchorage, Alaska advanced the borings and installed the ground water monitoring wells and soil gas points. Analytical testing of the project samples was conducted by SGS North America, Inc. (SGS) of Anchorage, Alaska and Eurofins/Air Toxics, Inc. (Eurofins) of Folsom, California. Emerald Alaska (Emerald) of Anchorage, Alaska transported the IDW for disposal at the Columbia Ridge Landfill in Arlington, Oregon.

3.0 FIELD ACTIVITIES

Field work was conducted by or under the supervision of ADEC-qualified personnel, as defined by 18 Alaska Administrative Code (AAC) 75.990. Site photographs taken during field activities are presented in Appendix A. Field notes from the additional site characterization field work are included as Appendix C.

3.1 Work Plan Variances and Project Scope Modifications

Variations from the work plan and their impact to data usability and/or project objectives are listed below.

- Pre-packed well screens were used due to heaving sand encountered in the borings. This variance should not adversely affect the groundwater data.
- A groundwater sample was collected from Well MW-6, which had been presumed lost. The analytical sample collected from Well MW-6 was tested for the same suite of analytes (GRO, DRO, and VOCs) as downgradient Well MW-4. Monitoring Wells MW-7 and MW-9 were not located; therefore groundwater samples were not collected from these wells.
- The purging conducted for several monitoring wells did not fully satisfy the criteria stated in the work plan. Specifically, three well volumes were not removed from the well after one hour of effort had been expended without the water quality stabilization. Because the wells were properly developed, this variance should not adversely affect the groundwater data for the purposes of site characterization. Note that no-purge sampling has been shown to be acceptable for non-closure groundwater sampling.
- Each soil gas point was constructed using a stainless steel mesh sample screen rather than an air stone. The general construction details (e.g. silica sand thickness around the sampling screen) were modified to accommodate the length of the sample screen. This variance should not adversely impact data quality or usability.

3.2 Site Preparation

A Shannon & Wilson representative visited the site several times between April 8th and May 2nd to coordinate the temporary removal of vehicles, equipment, and other stored items to allow site access to the proposed boring locations. A Shannon & Wilson representative met with utility contractors on April 8 and 16, 2013 to locate buried utilities in the project area and identify potential conflicts. On April 22, 2013 Hallmark Excavation & Underground LLC, visited the Property to locate private water lines associated with the on-site drinking water well. Existing as-built plans were used to avoid the on-site remediation system piping.

3.3 Soil Borings and Sample Collection

Six soil borings (Borings B10 through B15) were advanced on May 2 and 3, 2013 by Discovery and three of the borings were completed as monitoring wells (Wells MW-10, MW-13, and MW-14). The approximate locations of the soil borings are shown on Figures 3 and 4.

Boring/monitoring well B10/MW-10 was installed near the southeast corner of the Property to evaluate background soil and groundwater concentrations upgradient of the site with respect to the groundwater flow. Borings B11 and B12 were generally installed to evaluate the potential presence of wide-spread contamination for concerns identified in our September 2012 Phase I ESA report. Boring B11 was advanced near the northeast corner of the car wash structure to evaluate potential releases from the 55-gallon drum storage area, floor drains, chemical containers, above ground storage tank, and the underground garage. Boring B12 was advanced on the west side of the 3607 Spenard Road maintenance shop to evaluate potential releases from abandoned/existing hydraulic lifts and floor drain systems, vehicles, and 55-gallon drums. Borings/monitoring wells B13/MW-13 and B14/MW-14 were installed west of the Property on the 3608 Spenard Road parcel to help define the extent of off-Property soil and groundwater contamination. Soil Boring B15 was advanced in the southwest corner of the Property to evaluate whether the documented gasoline releases in this area have penetrated the presumed silty clay confining layer underlying the shallow unconfined aquifer and impacted a deeper groundwater aquifer.

3.3.1 Drilling

Discovery provided a truck-mounted hollow-stem auger drill rig, with direct-push capabilities, to advance the borings and install the monitoring wells. A Shannon & Wilson representative was present during the field activities to identify the boring locations, log the materials encountered during drilling, and collect field soil samples. Borings B10, B13, and B14

were advanced to approximately 5 feet below the observed groundwater contact to facilitate monitoring well installation. Borings B11 and B12 were advanced to the observed groundwater contact. Boring B15 was advanced into the clayey silt soil underlying the former UST system to depth of approximately 22 feet bgs. The objective of this boring was to collect representative soil samples from below the benzene contaminated water and determine the depth to which contamination extends into a fine-grained silt/clay soil strata that may function as an aquitard.

3.3.2 Soil Samples

Soil samples were collected continuously from Borings B10 through B14 using a 2-foot split-spoon sampler driven into the bottom the boring. For Boring B15, Discovery used hollow-stem auger and split-spoon sampling techniques to advance the boring to a depth of approximately 10 feet bgs. Discovery then used direct push methods and sealed drilling rods to advance the boring through the benzene contaminated water and into the silt/clay soil strata, which was encountered at a depth of approximately 18 feet bgs based on drill action. Once the drill action indicated that the boring had been advanced about 2 feet into the silt/clay soil, the sealing pin was removed from the drilling rods and soil samples were collected using 5-foot long, 1.5-inch inner diameter (I.D.) steel macrocore samplers equipped with fitted plastic liners and driven with a hydraulic hammer.

3.3.3 Field Screening

Each soil sample was visually classified for soil type, and “screened” for volatile organic compounds (VOCs) using a Thermo Instruments OVM 580B photoionization detector (PID) calibrated with 100 parts per million (ppm) isobutylene standard gas, and an ADEC-approved headspace sampling method. Headspace samples were collected in resealable plastic bags by filling them with freshly exposed soil and then sealing the top. Headspace samples were warmed, and PID readings were obtained within 60 minutes of the sample collection.

3.3.4 Analytical Sample Collection

Two analytical samples collected from each boring were selected for laboratory testing. With the exception of Boring B15, one analytical sample was collected from within the sampling interval directly above the groundwater contact observed during drilling, and the second sample was selected from the depth interval exhibiting the highest screening result. In the absence of indicators of contamination, the second sample was collected from within the top 5 feet of soil, where heavy metal contaminants and polychlorinated biphenyls (PCBs) would likely be located, if present due to a surface release. For Boring B15, the sample with the highest screening result

and the sample collected from the silt/clay soil were selected for analysis. In addition, one field duplicate soil sample was collected for quality control measures.

Soil samples were collected for analysis of both volatile and non-volatile compounds. Sample jars were filled using decontaminated stainless steel spoons, and transferred to the laboratory in coolers with ice packs, using chain of custody procedures. The soil samples analyzed for volatile constituents were collected using a method field extraction in accordance with the ADEC sampling procedure for Alaska Method (AK) 101 and EPA Method 8021B/8260B. The number, depth, and classification of samples collected for the project are summarized in Table 1 and shown on the respective boring logs included in Appendix B.

Drill cuttings from Borings B10, B13, B14, and B15 were containerized in labeled, 55-gallon drums and stored on site. Drill cuttings from Borings B11 and B12 were used to backfill the respective boreholes. Boring 15 was backfilled with coated bentonite chips to provide a seal within the clayey silt soil. Headspace screening samples and soil collected in unpreserved sample jars not submitted for laboratory analysis were placed in the respective borehole drum.

3.4 Monitoring Well Installation and Development

Borings B10, B13, and B14 were completed as groundwater monitoring wells. Monitoring well construction details are provided in Appendix B.

3.4.1 Monitoring Well Installation

The monitoring wells were installed through the hollow-stem casing. The monitoring wells were constructed of 2-inch nominal inside diameter schedule 40 polyvinyl chloride (PVC) pipe with threaded connections. The lower portion of the wells consisted of 10-foot sections of 0.010-inch slotted pre-packed well screen. The well screen was positioned 5 feet above and 5 feet below the groundwater contact observed during drilling. For Well MW-10, the screen extended from the bottom of the boring at about 12 feet bgs to about 2 feet below the surface of the site and for Wells MW-13 and MW-14, the screen extended from the bottom of the boring at about 17 feet bgs to about 7 feet below the surface of the site. After well completion, static water levels were measured at depths approximately 2 to 5 feet above the static water level below the top of the screen sections. A sand pack of #20-#40 silica sand was used to backfill around the well screen to about 1 foot above the screened section. Bentonite chips were used to backfill around the PVC piping above the sand backfill to about 1 foot bgs. An above-ground protective casing was installed and embedded in cement around Well MW-10. Flush-mount protective

casing were installed and embedded in asphalt around Wells MW-13 and MW-14. Monitoring well construction details are provided in Appendix B.

3.4.2 Monitoring Well Development

Monitoring Wells MW-10, MW-13, and MW-14 were developed May 8, 2013. Prior to development, water depth relative to the well casing was measured in each well, including pre-existing wells, with an electronic water level indicator. The development initially consisted of alternating 3- to 5-minute periods of surging and purging followed by purging. Water quality parameters, including conductivity, pH, temperature, and turbidity were recorded during development. Well development was considered complete for Wells MW-10 and MW-13 when the following stabilization criteria were met over three consecutive readings: pH was within 0.1 unit, temperature was within three percent (minimum 0.2 degree Celsius), turbidity was within 10 percent or is less than 10 nephelometric turbidity units (NTU), and conductivity was within 3 percent. The water quality parameters did not stabilize while developing Well MW-14. Instead, development for this well was considered complete after 55 gallons of water were removed. The development water was contained in 55-gallon drums and stored on site. The well development data are summarized in Table 2.

3.5 Site Reconnaissance and Well Maintenance

Prior to initiating groundwater sampling, a Shannon & Wilson field representative conducted a well reconnaissance on April 16 and May 8, 2013 to locate Monitoring Wells MW-1 through MW-9. During the April 16, 2013 reconnaissance, the protective casings for Wells MW-2 and MW-5 were found to be missing although the well caps for the PVC casings were intact. On May 2, 2013, Discovery replaced the flush-mount protective casing for Well MW-2 which was embedded in asphalt. During the May 8, 2013 reconnaissance, Wells MW-4 and MW-5 were found to contain bentonite and/or other debris. Discovery used a high-pressured air hose to blow the bentonite and/or other debris out of the well casings for Wells MW-4 and MW-5. In addition, Discovery replaced the protective flush-mount protective casings for Wells MW-5, MW-6, and MW-9. The protective casing lid was replaced for Well MW-1. Note that Wells MW-7 and MW-8 were not found during the site reconnaissance and are presumed lost. Well MW-2 had an apparent ice blockage at 2 feet bgs and could not be sampled.

3.6 Groundwater Sampling

Groundwater samples were collected from the three new wells (MW-10, MW-13, and MW-14) and from existing Monitoring Wells MW-1, MW-3, MW-4, MW-5, MW-6, and MW-9.

Sampling was initiated using a water level indicator to measure depth to water for evaluation of groundwater flow direction and gradient. Note that Wells MW-4 and MW-5 which were found to contain bentonite and/or other debris were not re-developed prior to sampling. Low-flow purging was used to reduce the effects of stagnant well casing water on chemical concentrations, and to obtain groundwater samples that are representative of the surrounding water-bearing formation. The wells were purged and sampled with a submersible pump and disposable polyethylene tubing. During the purging process, field personnel monitored water quality parameters (pH, temperature, turbidity, oxidation reduction potential [ORP], and conductivity) purge volume, and drawdown. The pump rate was set at 0.09 to 0.22 liters per minute (L/min), with a goal of limiting the sustained drawdown to a maximum of 4 inches. However, the pump rate for Well MW-6 varied between 0.1 L/min to 1.5 L/min. When four of the five water quality parameters stabilized and purge volume requirements (at least 1 well volume) were met, or one hour of effort was expended, a groundwater sample was collected. Stabilization criteria comprised three successive readings of: pH within 0.1 unit, temperature within 3 percent (minimum 0.2 degree Celsius), conductivity within 3 percent, ORP within 10 millivolts (mV), and turbidity within 10 percent or three consecutive readings of less than 10 NTUs. The final water quality parameters are listed on Table 2.

3.7 Drinking Water Well Sampling

Drinking water samples were collected from three drinking water wells on May 13 and 14, 2013. The wells are located at 3609 Spenard Road (the Property), 1204 Wilshire Avenue, and 3704 Wilson Street as shown on Figure 6. In addition, multiple unsuccessful attempts were made to contact the tenants of the 3740 and 3801 McCain Loop properties. To prevent possible cross contamination, the well head for the drinking water wells was not opened during sampling. Instead, a faucet was used to purge the water system and collect the drinking water well sample. The samples from 3609 Spenard Road and 1204 Wilshire Avenue were collected from kitchen faucets. The water sample from 3704 Wilson Street was collected from an exterior hose bib. No water treatment or aeration devices for the water systems were observed. The flow rate from the faucet was set at less than 0.1 liter per minute to avoid aeration. The water from the faucets was allowed to run for approximately 15 minutes to purge the system before sampling. The purgewater was discharged to the sanitary sewer system or to the ground surface.

3.8 Soil Gas Point Installation and Sampling

On May 6, 2013, three nested soil gas points, designated Soil Gas Points SGP1 through SGP3, were installed south of the 3607 Spenard Road structure at the approximate locations shown on Figure 2.

3.8.1 Soil Gas Point Installation

Each nested pair included two soil gas points – one each installed at about 5 and 10 feet bgs. Each soil gas point consisted of a 10-inch long stainless steel mesh sample screen connected to Teflon-lined tubing. To install the soil gas points, a 3.5-inch diameter split-spoon sampler was driven into the ground. Every 2 feet the sampler was removed from the ground and the soil was removed from the sampler. The sampler was reinserted into the ground and the process was repeated until the sampler reached approximately 10 feet bgs. The mesh sample screen was connected to Teflon-lined tubing and lowered into the bottom of the hole. Approximately 1 foot of silica sand was placed around the sample screen and 1 foot of hydrated bentonite chips was placed above the sand to create a seal. Drill cuttings were placed on top of the bentonite seal to approximately 5 feet bgs. The second sample screen was connected to tubing and lowered into the hole to approximately 5 feet bgs. The borehole was backfilled with approximately 1 foot of silica sand which extended above and below the sample screen. Approximately 1 foot of hydrated bentonite chips were placed above the sand. Drill cuttings were placed on top of the bentonite seal to approximately 1 foot bgs. Pea gravel was placed above the drill cuttings to approximately 0.5 foot bgs. Excess drill cuttings were containerized in labeled, 55-gallon drums and stored on site. A flush-mount protective monument was installed around each nested soil gas point and embedded in asphalt to match the surrounding surface. The soil gas point construction details are shown on Figure 7.

3.8.2 Leak Detection

Leak detection tests, including a shut-in test and tracer test, were conducted to assess whether good seals were established in the sample train and in the ground surrounding the sampling probe. A shut-in test to verify the sampling train seal was conducted by drawing a vacuum on the sampling train, sealing the ends, and observing the vacuum integrity. To apply the vacuum, the three way valve was set to prevent flow from the subsurface probe, and the end of the tube where the suma canister is connected was sealed using a plug. A hand pump was attached to a fitting at the location specified for “pump with flow meter” on Figure 7. The hand pump was used to create a vacuum on the sampling train, and the three-way valve was then shut

to isolate the portions of the sampling train on each side of the valve. The vacuum on the sample side was monitored using the gauge on the flow meter apparatus, and the vacuum on the field screening side was monitored using the gauge on the hand pump. Both sides were monitored for approximately 1 minute. The vacuum within the sampling train did not change over that period, verifying a proper seal. A schematic of the leak detection and sampling apparatus for the soil gas point is included in Figure 7.

Helium was used for a tracer test to verify a proper ground seal between the subslab probe tip and the ambient air. The test was conducted throughout the soil gas sampling process by maintaining a positive pressure of helium within the leak detection hood, and testing the analytical soil gas samples for helium content.

3.8.3 Soil Gas Sampling

Following installation of the soil gas points, the subsurface conditions were allowed to equilibrate for 10 days prior to sampling. The on-site remediation system was turned off on May 15, 2013 prior to sampling. Teflon tubing was connected from a 1/4-inch Swage Lock fitting on the soil gas point to the pumping train through the leak detection hood.

The soil gas sampling process was initiated by purging three to five dead-space volumes from the sampling train using an air pump and flow meter. The dead-space volume was estimated by summing the internal volume of the tubing between the probe tip and the sampling devices, and annular space around the probe tip.

Following purging, a soil gas sample was collected from each monitoring point into a tedlar bag and summa canister. Field screening readings for organic compounds were taken from the tedlar bag using a flame ionization detector (FID). Screening results are shown on Table 1.

Analytical vapor samples were collected using 6-liter, laboratory-supplied Summa canisters. The canisters were filled with soil gas vapor at a fixed flow rate of about 83 millimeters per minute using a flow controller calibrated by the laboratory. The initial vacuum reading for each canister, typically negative 30 inches mercury, was recorded prior to sampling. The residual vacuum reading for each canister after sampling, ranging from a negative 5 to negative 6.5 inches mercury, was also recorded prior to shipment to the laboratory.

3.9 Level-Loop Survey

The horizontal and vertical locations of the newly installed monitoring wells (Wells MW-10, MW-13 and MW-14) and seven existing wells (Wells MW-1 through MW-6 and Well MW-9) were surveyed on May 31, 2013. Well elevations were measured at the marks on the top of the PVC casings, to a resolution of 0.01 foot relative to a temporary benchmark that was assigned an elevation of 100.00 feet. The well elevations and corresponding groundwater elevations are listed in Table 2. In addition, the horizontal positions of the wells, borings, and soil gas points was recorded using swing tie measurements to site features.

4.0 LABORATORY ANALYSIS

Soil, groundwater, and drinking water samples were delivered to SGS using chain-of-custody procedures. The samples were tested on a standard 7- to 10-day turnaround time. The four soil samples from Borings B11 and B12 were analyzed for GRO by AK 101, DRO by AK 102, residual range organics (RRO) by AK 103, and VOCs by EPA 8260B. One sample from each of Borings B11 and B12 was also analyzed for polycyclic aromatic hydrocarbons (PAHs) Selective Ion Mode (SIM) by EPA 8270D, RCRA metals by EPA 6020, and PCBs by EPA 8082A. The samples from Borings B10, B13, B14, and B15, plus a duplicate, were analyzed for GRO by AK 101, DRO by AK 102, and BTEX by EPA 8021B. A methanol trip blank accompanying the sample cooler was analyzed for GRO by AK 101 and VOCs by EPA 8260B.

The groundwater samples collected from Wells MW-1, MW-3, MW-4, MW-6, MW-10, and a field duplicate collected from Well MW-4 were tested for GRO by AK 101, DRO by AK 102, and VOCs by EPA 8260B. A field duplicate sample collected from Well MW-4 was analyzed for GRO by AK 101, DRO by AK 102, and VOCs by EPA 8260B. The groundwater samples collected from Wells MW-5, MW-9, MW-13, and MW-14 were tested for GRO by AK 101, DRO by AK 102, and BTEX by EPA 8021B. One trip blank accompanying the sample cooler was analyzed for GRO by AK 101 and VOCs by EPA 8260B and a second trip blank was analyzed for GRO by AK 101 and BTEX by EPA 8021B.

Three drinking water samples were tested for GRO by AK 101, DRO by AK 102, and VOCs by EPA 524.2. A trip blank accompanying the sample cooler was also analyzed for GRO by AK 101 and VOCs by EPA 524.2.

Six project soil gas vapor samples and one duplicate were collected and submitted to Eurofins, for laboratory analysis on a standard 7 to 10 business day turn-around-time. Each sample was analyzed for VOCs by EPA Method TO-15 (15 Toxic Organics) Selective Ion Mode (SIM); and

helium (to evaluate the effectiveness of the seal), carbon dioxide, methane, and oxygen (to evaluate biodegradation potential) by ASTM International Inc. D-1946 (ASTM D-1946).

Under the sample numbering scheme used for this project, a typical analytical sample number is 32-1-17525-002-B10S2 for soil samples, 32-1-17525-002-MW-1 for groundwater samples, 32-1-17525-002-DW1 for drinking water samples, and 32-1-17525-002-SGP1S for soil gas vapor samples. The “32-1-17525-002” indicates the Shannon & Wilson job number, and the “B10S2”, “MW-1”, “DW1”, and “SGP1S” represent the sample identification numbers. For brevity in the text of this report, the “32-1-17525-002” prefix is omitted. Analytical results are summarized in Tables 3 through 6. Copies of the analytical results are provided in Appendix D.

5.0 SUBSURFACE CONDITIONS

Nine borings completed as groundwater monitoring wells, MW-1 through MW-9, were advanced on and off-Property during previous site investigations. The borings were advanced to 17 to 21 feet bgs. In addition, multiple excavations have been advanced on Property in conjunction with on-going remedial activities. The following soil and groundwater conditions have been summarized based on the information provided in the former release investigation, remedial action, quarterly groundwater monitoring reports, and the current additional site characterization activities.

5.1 Soil

The Property in the vicinity of the former UST system is currently covered with asphalt pavement. Underlying the pavement, former borings and excavations typically encountered sand with varying gravel and silt content. Boring logs indicate the sand layer extends to a depth of 14 to 21 feet bgs. A thin, intermittent silt-rich lense measuring from less than 1 foot to about 4.5 feet thick was encountered in eight soil borings (on-site Borings MW-2, MW-3, B10 and B12, and off-site Borings MW-5, MW-6, B13, and B14) at depths ranging from 1 to 5.5 feet bgs. During previous investigations, a gray, clayey silt was encountered beneath the sand layer starting at depths ranging from 14 to 21 feet bgs with the exception of off-site wells MW-5 and MW-7. Based on drill action, the fine-grained soil layer was encountered in Boring B15 from 18 feet bgs to the base of the boring at 22 feet bgs.

5.2 Groundwater

Historically, groundwater was encountered in the soil borings and excavations at depths ranging from 10 to 13.5 feet bgs. During the May 2013 field efforts, water levels were observed at

approximately 12 feet bgs while drilling Borings B12, B13, and B14, and at approximately 8 feet bgs and 9.5 feet bgs in Borings B10 and B11, respectively. After monitoring well installation, static water levels were measured at 4.26 feet bgs, 10.68 feet bgs, and 10.45 feet bgs, in Wells MW-10, MW13, and MW-14, respectively. Historically, the direction of groundwater flow has ranged from the southwest to the northwest. Based on the current groundwater data measured on May 8, 2013, the flow direction is toward the west/northwest. Based on historical data, the gradient has ranged from 0.3 to 2.6 percent. The groundwater potentiometric surface is shown on Figure 4.

6.0 DISCUSSION OF ANALYTICAL RESULTS

The soil and groundwater results were compared to applicable cleanup levels listed in the Oil and Other Hazardous Substances Pollution Control Regulations (18 AAC 75, April 2012). The soil criteria are based on the most stringent Method 2 cleanup levels listed in Tables B1 or B2 for the “under 40-inch (precipitation) zone”. The groundwater criteria are based on cleanup levels listed in Table C, 18 AAC 75. The drinking water results were compared to drinking water regulations listed in 18 AAC 80. The soil gas criteria are based on the target levels for shallow and deep soil gas listed in the ADEC 2012 *Vapor Intrusion for Contaminated Sites* guidance document.

The cleanup levels and analytical results for the soil samples collected for this project are listed in Table 3. The applicable groundwater and drinking water cleanup levels are listed in Tables 4 and 5, respectively. The soil gas target levels are listed in Table 6.

6.1 Soil

Petroleum Hydrocarbons

Twelve project samples and one duplicate soil sample were submitted for laboratory analysis. A summary of the analytical results is provided in Table 3. The benzene concentrations measured in Samples B10S2 (estimated concentration of 0.0284 mg/kg) and B15S5 (0.277 mg/kg) exceed the 0.025 mg/kg ADEC Method 2 cleanup level. Note that the benzene concentration measured in Sample B10S2 was estimated and there is a level of uncertainty due to benzene detections in both the soil trip blank and method blank. Sample B15S5 also contained detectable toluene, ethylbenzene, and xylenes, but at concentrations less than the ADEC Method 2 cleanup levels. The second sample from Boring B15, collected from the silt/clay soil layer between 18 and 22 feet bgs, did not contain detectable petroleum hydrocarbons except a trace xylene concentration several orders of magnitude less than the ADEC cleanup level. These results indicate that the silt/clay layer is an effective barrier to vertical contaminant migration and that a deeper water-

bearing formation would likely not be impacted by the impacted media associated with the former UST, piping and dispenser source area.

As depicted on Figure 4, petroleum hydrocarbon soil contamination appears to be mostly confined to areas surrounding the former UST system. However, the benzene levels in Sample B10S2, collected from shallow soils (collection depth of 2 feet to 4 feet bgs) in the southeast corner of the Property, may be indicative of contamination associated with surface staining and not the former USTs. The relatively low benzene concentration (estimated at 0.0136 mg/kg) measured in the deeper sample collected from Boring B10 (Sample B10S3 collected from 4 feet to 6 feet bgs), suggest that concentrations greater than ADEC Method 2 cleanup values are not ubiquitous and are confined to the surface/near-surface soil at this location. Note that the limited scope of this field assessment did not include extensive surface sampling, and therefore additional impacted surface soils may be present at the site, although the samples from Boring B11 and B12 contained target compound concentrations well below ADEC cleanup levels, and did not contain detectable benzene after adjusting for method blank and trip blank contamination. GRO, DRO, and BTEX constituents were either not detected in the remaining project samples or were measured at concentrations less than the ADEC Method 2 cleanup levels.

Estimated concentrations of toluene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene were measured in Sample B12S2 and xylenes detected in Sample B12S6, but at concentrations less than the ADEC Method 2 cleanup levels. Estimated concentrations of seven PAHs were measured in the samples from Borings B11 and B12, but at concentrations less than the ADEC Method 2 cleanup level.

Metals

Samples B11S1, B11S5, and B12S2 contained arsenic and chromium concentrations greater than the most stringent ADEC cleanup criteria. However, these metals concentrations are consistent with typical background concentrations for the Anchorage area and are thus considered naturally occurring and not anthropogenic. In addition, the results of the metals and VOC testing suggest that the soil in the areas investigated would not be classified as a characteristic hazardous waste under Resource Conservation and Recovery Act (RCRA) regulations.

Polychlorinated Biphenyls

PCBs were not detected in the two project soil samples tested for these compounds.

6.2 Groundwater

Ten groundwater samples, including one field duplicate sample, were submitted for laboratory analysis. As shown in Table 4, GRO and DRO were measured in the sample collected from Well MW-3 at concentrations of 49.6 mg/L and 4.76 mg/L, respectively. These concentrations exceed the ADEC Table C criterion for GRO (2.2 mg/L) and DRO (1.5 mg/L). The benzene concentrations detected in the samples from Wells MW-3 (658 micrograms per liter [$\mu\text{g/L}$]), MW-4 (114 $\mu\text{g/L}$), MW-5 (67.4 $\mu\text{g/L}$), and MW-15 (54.2 $\mu\text{g/L}$) are greater than the cleanup criterion of 5 $\mu\text{g/L}$. In addition, the toluene, ethylbenzene, xylenes, 1,2,4-trimethylbenzene, and 1,2-dichloroethane concentrations measured in the sample from Well MW-3 exceed the ADEC cleanup levels. Detectable concentrations of GRO, DRO, and VOCs were reported in other groundwater samples, but at concentrations less than the ADEC cleanup levels. As shown in Figure 5, the groundwater contaminant plume appears to be delineated to the north (Well MW-6), east (Wells MW-1 and MW-10), and to the southwest (Well MW-13). The extent of groundwater contamination to the northwest has not been fully defined.

As shown in Table 7, the current groundwater data are generally consistent with the fluctuations in the historical data. However, overall decreasing trends in contaminant concentrations appear evident in samples from Wells MW-2, MW-5, and MW-9.

6.3 Drinking Water

Three drinking water samples were submitted for laboratory testing. Concentrations of four VOCs were measured in Sample DW-1, but at concentrations less than that drinking water maximum contaminant levels (MCLs). VOCs were not detected in the remaining project samples. The project samples did not contain detectable concentrations of GRO and DRO.

6.4 Soil Gas Vapor

Seven soil gas samples, including one field duplicate, were submitted for laboratory testing. A summary of the analytical results is provided in Table 6. The vapor sample from Soil Gas Point SGP-3S contained a benzene concentration of 530 micrograms per cubic meter ($\mu\text{g/m}^3$) which exceeds the 160 $\mu\text{g/m}^3$ ADEC benzene target level for shallow soil gas. Twenty three additional VOCs were detected in one or more project samples but at concentrations less than ADEC target levels. Note that the FID measurements for each soil gas sample were 0.0 ppm which do not correlate to the hydrocarbon concentrations detected.

The soil gas vapor samples were also analyzed for helium to determine if there was a leak in the sample train and for oxygen to determine the percentage of oxygen in the subsurface soil. Helium was not detected in the project samples and oxygen was measured in each of the samples at concentrations of 19 to 20 percent. In addition, the samples were tested for methane and carbon dioxide to evaluate the biodegradation of contaminants in the soil gas. According to the ADEC's Vapor Intrusion Guidance document, the percentage of oxygen measured in the soil gas samples indicates that the subsurface is sufficiently oxygenated for potential biodegradation. Carbon dioxide was detected in each project sample at concentrations ranging from 0.048 to 0.88 percent. The presence of carbon dioxide suggests that aerobic biodegradation may be occurring, although levels are less than what might be expected for significant concentration reduction.

6.5 Quality Assurance Summary

The project laboratory implements on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC data quality objectives (DQOs). Internal laboratory controls to assess data quality for this project includes surrogates, method blanks, laboratory control sample/laboratory control sample duplicates (LCS/LCSD), and matrix spike/matrix spike duplicates (MS/MSD) to assess precision, accuracy, and matrix bias. If a DQO was not met, the project laboratory provides a report specific note identifying the problem in the Case Narrative section of their Laboratory Analysis Report (See Appendix D).

Shannon & Wilson reviewed the SGS data deliverables and completed the ADEC's Laboratory Data Review Checklist (LDRC), which is included in Appendix D. Table 8 provides comparisons of the primary and field duplicate samples. Quality control discrepancies and the impact to data quality/usability are described in the further detail in the LDRC, and are reflected in data flags on Tables 3 through 5, as appropriate. In our opinion, no non-conformances that would adversely impact data usability for the objectives of this project were noted, except the following.

- Benzene and other VOC compounds were detected in method blank and trip blank samples at estimated concentrations less than the laboratory reporting limits. Estimated concentrations of the same compounds in corresponding project samples were assigned a non-detect value at the laboratory limit of quantitation, and flagged with a "B" qualifier. The estimated benzene concentration in Sample B10S2 was not flagged, because the method blank associated with this sample did not contain detectable benzene. However, the trip blank for this sample did contain benzene, although it is not clear if that content

was due to trip blank contamination (which would lead to a qualification of project Sample B10S2) or to benzene in the method blank associated with the trip blank sample.

Based on this quality assurance summary, we find the project data to be complete and useable to support the intended data uses.

7.0 INVESTIGATION DERIVED WASTE

Soil cuttings from Borings B10 and Borings B13 through B15, and Soil Gas Points SGP1 through SGP3 were placed in labeled 55-gallons drums and temporarily stored on site. In addition, development water from Wells MW-10, MW-13, and MW-14 and purgewater from each of the sampled wells was stored in labeled 55-gallon drums. On June 19, 2013, Emerald transported one drum of soil cuttings from Boring B15, two drums of soil cuttings generated from Soil Gas Points SGP1 through SGP-3, one drum of development water from Well MW-14, and one drum of purgewater to their Anchorage facility for disposal as non-regulated waste. On June 27, 2013 Emerald transported one drum of soil from Boring B10 to their Anchorage facility for disposal as non-regulated waste. Copies of the waste manifests are provided in Appendix E. The remaining drums of soil and water were landspread on unpaved portions of the Property on June 27, 2013.

8.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) was prepared to identify known and potential exposure pathways associated with petroleum hydrocarbons at the subject site. The CSM was developed using the ADEC's *Policy Guidance on Developing Conceptual Site Models* (October 2010), and the ADEC's CSM Human Health Graphic and Scoping Forms. The ADEC forms are included in Appendix F. The section provides a summary of our current understanding of contaminant sources, extent of impacted media, and potential exposure pathways. The narrative includes descriptions of site-specific considerations that increase or decrease the viability of each pathway at this site.

8.1 Contaminant Sources

The primary known contaminant source was the former UST system, including nine USTs, 14 dispensers, and support piping. Petroleum-hydrocarbon impacted soil and groundwater are present on and off site as a result of leaks from the former UST system. In addition, free product was observed on the groundwater in on-site well MW-3 in 1998.

In addition to the former UST, piping, and dispenser system, other potential contaminant sources identified in Shannon & Wilson's 2012 Phase I ESA include petroleum hydrocarbons and a variety of other chemicals that could have been discharged through the site's floor drains or via leaks in vehicles, batteries, fuel storage tanks, 55-gallons drums, and chemical containers. Numerous surface stains were noted throughout the Property on both paved and unpaved surfaces. The May 2013 analytical soil data provide qualified indications that hydrocarbon contamination may be associated with surface stains on the Property (i.e. the estimated benzene concentration measured in Sample B10S2), whereas data from other borings (e.g., Borings B11 and B12) appear to close data gaps pertaining to the potential for significant contamination at other areas investigated.

8.2 Extent of Contamination

This section summarizes what is currently known about the lateral and vertical extent of contamination at the site. The discussion is limited to those compounds that have been measured at concentrations greater than the most stringent ADEC cleanup levels.

8.2.1 Impacted Soil

Former UST/Dispenser System. The soil conditions in the UST/dispenser source area following tank removal in 1995 were initially documented by soil samples from the boring for Well MW-3, which contained contaminant concentrations above current ADEC Method 2 cleanup levels, and from the boring for Well MW-2, which contained detectable levels less than the current cleanup levels. Since then, contaminant concentrations in the UST/dispenser source area have likely decreased through a combination of natural attenuation and active remediation.

Remedial actions at the site have included soil removal, passive bioventing, and forced-air SVE/AS. Over 2,000 tons of contaminated soil have been excavated and treated at an off-site facility. In general, impacted soil was removed from the ground surface in the vicinity of the former USTs and dispensers to the groundwater table interface 13 to 14 feet bgs, although the south end of the west excavation advanced to 16 feet bgs (See excavation extents on Figure 2). The objective of the 2001 excavation activities was "to remove as much impacted soil as effectively possible". Contaminated soil was therefore removed from within the unsaturated zone to the west and south of the garage structure and at the former diesel UST location. Following excavation, confirmation soil samples verified impacted soil remained in the undisturbed soil in each of the three excavation areas (west excavation, south excavation, and former diesel UST excavation), primarily at the groundwater table interface at the excavation

base and beneath the existing structure. The highest GRO and benzene concentrations (8,410 mg/kg and 28.6 mg/kg, respectively) were measured in a soil sample collected 12 feet bgs adjacent to the garage structure, where structural concerns prevented additional excavation. However, soil samples collected throughout the excavation base between 11 and 16 feet bgs contained benzene, GRO, and/or DRO concentrations greater than current ADEC cleanup levels.

The lateral and vertical extent of impacted soil is estimated using soil data from all monitoring wells, soil borings, test pits, and excavation confirmation samples collected between 1996 and 2001. Data from each of these efforts have consistently indicated the highest concentrations in soil are generally measured in samples at or above the observed groundwater interface, which was typically encountered between 11 and 13 feet during excavation and drilling. The data used to estimate the lateral extent of impacted soil are shown in Figure 4, and suggest the impacted smear-zone soil is largely confined to the immediate vicinity of the former UST/dispenser source area(s). Samples from the 2001 excavation and a test hole excavated south of the south excavation suggest the impacted smear-zone soil extends beneath the garage structure and/or into the Chugach Way and Spenard Road rights-of-way. Soil contamination beyond these general boundaries appears to be delineated in each direction, as soil samples collected from the apparent groundwater smear zone interval in on-Property Borings MW-1, MW-2, MW-4, MW-10, B11, and B12, and off-Property Borings MW-5 through MW-9 and MW-13 and MW-14 did not contain concentrations of petroleum hydrocarbons exceeding the current Method 2 ADEC cleanup criteria.

Vertical contamination migration through the shallow unconfined aquifer appears to be sufficiently retarded by the apparent silt/clay confining layer present at depths starting from 14 to 18 feet bgs in the vicinity of the former UST system. An analytical sample collected 18 to 22 feet bgs in Boring B15 did not contain detectable hydrocarbon constituents except an estimated xylene concentration three orders of magnitude less than the corresponding cleanup level.

It is important to note that additional concentration reduction since the 2001 soil removal action has likely occurred through natural attenuation and operation of the SVE/AS system. The SVE system was installed in 2003 and is apparently still operational, although data regarding the operation, maintenance, and performance of the system was not available for the present study. The cumulative effects of various remedial action on the soil concentrations may be indicated by a comparison of soil data from the MW-3 and B15 soil borings. A soil sample from MW-3 in 1996 (collected 11 feet bgs) contained 1,000 mg/kg VPH/GRO, 74.5 mg/kg EPH/DRO, 55.4 mg/kg benzene, and 526 mg/kg total BTEX. In comparison, the B15 soil sample collected in May 2013 (depth of 8 to 10 feet bgs) contained 42.4 mg/kg GRO, non-detectable DRO, 0.277

mg/kg benzene, and 17.53 mg/kg total BTEX. A similar comparison can be made between the trace to non-detectable sample results for 2013 Boring B12 and the 2001 confirmation soil samples from the west excavation area.

Non-UST Contaminant Source(s). Benzene-impacted soil was documented in the southeast corner of the Property. The petroleum hydrocarbon contamination detected in the Boring B10 samples is interpreted to be indicative of contamination not associated with the former USTs. The lateral extent of this potential contamination has not been established. The vertical extent was confirmed by the clean sample from Boring MW-10 at 4 to 6 feet bgs.

8.2.2 Groundwater Plume

The nine groundwater monitoring wells installed during previous release investigations have been sampled periodically since 1996. Four wells (Wells MW-1 through MW-4) are located on the Property while the remaining five wells (Wells MW-5 through MW-9) are located off-Property. Wells MW-5 through MW-9 were positioned down-gradient from the Property with respect to groundwater flow, which has historically been documented to vary between the southwest and northwest. The May 2013 field activities included installing three additional wells. Well MW-10 was positioned up-gradient from the former UST/dispenser source area, and Wells MW-13 and MW-14 were located off-Property to the west to further investigate the direction and extent of the impacted groundwater plume.

The historical groundwater data collected between 1996 and 2013 are listed on Table 7. By inspection, it is evident that target compounds have been measured at concentrations greater than current ADEC Table C levels at least once in each of the twelve wells except MW-8, MW-10, and MW-13. However, multiple wells have contained elevated concentrations in only one or two events, and several only in the initial event(s) following installation. Concentrations in Wells MW-1, MW-6, MW-7 and MW-9 have since decreased to trace or non-detectable levels. The wells that exhibited contaminant concentrations greater than cleanup levels in the May 2013 samples (or most recent sample if not tested in May 2013) are indicated on Figure 5. Based on these data, the impacted plume presently extends over the western portion of the Property encompassing Wells MW-2 through MW-4, across Spenard Road, and onto the parcel to the west, encompassing Wells MW-5 and MW-14.

An important component of the CCIC evaluation is establishing the plume dimensions and stability. The current data indicate the plume is bounded up-gradient with respect to groundwater flow direction (east/southeast of the former UST/dispenser area) by the results from

Well MW-10. The plume is largely bounded in cross-gradient directions by Wells MW-1, MW-6, MW-7, MW-8, MW-9, and MW-13. Well MW-4 has provided mixed results. This well typically contained only trace or non-detect contaminant levels until 2003; since then, samples have sporadically contained concentrations of GRO, DRO, and/or benzene greater than cleanup levels. The leading edge of the plume to the northwest of the site does not appear to be delineated. The May 2013 sample from the farthest down-gradient well, Well MW-14, contained 0.0542 mg/L benzene. Additional data are needed to evaluate seasonal fluctuations, long-term trends, and other components of plume stability on the 3608 Spenard Road parcel.

The history of measured benzene and GRO concentrations in on-site Well MW-3 and off-site Well MW-5, both located hydraulically downgradient from the former USTs and dispenser islands, suggest the magnitude and extent of groundwater contamination was affected by the September 2001 source soil removal activities. COC concentrations apparently decreased in on-site Well MW-3 and increased in off-site Well MW-5 as discussed below. Additional discussion of these trends is provided in Shannon & Wilson's October 2012 *Additional Environmental Assessment* document.

8.3 Exposure Pathways

Discussions of the potential exposure pathways are provided below. The narrative includes descriptions of site-specific considerations that increase or decrease the viability of each pathway at this Property. Note this CSM reflects only the known, documented contaminants of concern (COCs), and should be revised as warranted if additional site assessment is conducted to address data gaps regarding the nature and/or extent of impacted media.

8.3.1 Soil – Direct Contact

Direct contact with impacted soil comprises the incidental ingestion and dermal contact exposure routes. Both exposure routes are complete for current on-site commercial workers, site visitors, and trespassers and potentially complete for future on-site construction workers and residents. However, the reported concentrations of COCs in soil are less than the ADEC ingestion criteria; therefore there does not appear to be unacceptable risk for this pathway for petroleum hydrocarbon compounds. Factors that further mitigate the risk associated with this pathway include the site pavement that serves as a partial cap over the impacted soil area.

Detected COCs that are listed in Appendix B of the ADEC CSM guidance document for dermal exposure include seven PAH compounds and the metals arsenic, cadmium, and lead. The seven PAHs detected in soil samples collected from B11 and B12 were each measured at

concentrations are less than 1/10th of the ADEC Method 2 cleanup level for direct contact. Similarly, the reported metals concentration of metals are either within naturally-occurring background levels and/or are less than 1/10th the direct contact cleanup level. Therefore this pathway is considered insignificant.

8.3.2 Groundwater

ADEC guidance stipulates that ingestion of groundwater be considered a potentially complete exposure pathway unless a groundwater use determination is conducted in accordance with 18 AAC 75.350, and that determination finds that the groundwater is not “currently of reasonable expected future source of drinking water.” Therefore, ingestion and inhalation of volatile compounds in groundwater are potentially complete exposure pathways for current and future commercial workers, site visitors, and trespassers. Potential future receptors include on-site construction workers and on- and off-site residents.

Current drinking water data indicate that the impacted groundwater plume does not extend to on-site or off-site residential water wells. However, off-site residents are retained as potential future receptors in the event that the plume characteristics change and due to contaminant concentrations above the ADEC Method 2 cleanup levels in the soil.

8.3.3 Air

Volatile COCs have the potential to impact receptors through outdoor and indoor inhalation. The presence of volatile COC concentrations in soil within the top 15 feet bgs creates a potentially complete outdoor air exposure pathway for current and/or future site users, and potentially for users and residents of nearby properties. The viability of this pathway remains a data gap. The GRO and BTEX concentrations measured in the 2001 excavation confirmation samples near the on-Property structure are greater than the corresponding ADEC outdoor air inhalation standards. However, the concentrations measured during the May 2013 site characterization activities (Boring B15 soil samples) are less than the standards, suggesting that there may not currently be an unacceptable risk for this pathway.

Due to the proximity of buildings to the former UST source area, the indoor air pathway is potentially complete for current and future site users and building tenants. Soil gas samples collected from Soil Gas Points SGP-1 and SGP -2 contained detectable concentrations of VOCs. However, because the concentrations were less than ADEC target levels, the results suggest there is not an unacceptable risk to occupants of the current building. However, the higher levels

measured in the sample from Soil Gas Point SGP-3 indicate potential risk if new development is conducted closer to that location.

According to the ADEC's Vapor Intrusion Guidance document, the percentage of oxygen measured in the soil gas samples indicates that the subsurface is sufficiently oxygenated to support biodegradation. The presence of carbon dioxide is also consistent with the presence of aerobic microbial activity, although the levels measured are less than expected for significant and sustained hydrocarbon degradation. It is possible that the hydrocarbon and fixed-gas concentrations in the soil gas were impacted by the SVE system operation. If the soil gas did not reach equilibrium following the SVE shut-off, the concentrations of hydrocarbon and carbon dioxide could be biased low, and the oxygen concentration biased high. In this circumstance, however, the SVE operation would be positively effecting site remediation and possibly subslab depressurization of the current building structure.

8.3.4 Surface Water

The proximity of the subject site to Fish Creek suggests that surface runoff from the site could enter Fish Creek. However, due to the depth and extent of known soil contamination, it is unlikely that contamination from the site would impact the creek. Moreover, it is unlikely that water from Fish Creek satisfies the ADEC standard for use, currently or in the future, as a drinking water source for residential, recreational, or subsistence purposes. Therefore, ingestion of surface water is not considered a presently complete human health exposure pathway. This pathway may warrant additional consideration based on the results of future site assessment and/or to consider potential ecological receptors.

8.3.5 Other

Other impacted media, including sediment and biota, were not identified at the site. Based on the commercial/industrial site use, ecological receptors were not considered for this assessment.

8.3.6 CSM Summary

Multiple complete or potentially complete exposure pathways have been identified at the site. Exposure to impacted soil is currently mitigated by the site's commercial use and paved surface. The groundwater ingestion pathway is potentially complete for on-site commercial workers and site visitors, although drinking water samples verify the on-site well is not presently impacted at levels above MCLs. Outdoor and indoor air are both potentially complete pathways,

although additional soil data and/or site use plans are likely needed to more fully assess the potential risk posed to human health at this site.

It is noted that changes in the site use or other site conditions may affect the viability of potential exposure pathways. In particular, the CSM will need to be re-evaluated and revised as necessary if construction occurs at the site, a change in land use occurs, or additional information is obtained regarding either the previously-documented contaminated media and/or potential on-site sources.

9.0 DATA GAPS

During the course of our assessment, we identified the following data gaps – resolution of these data gaps may affect the analyses and findings presented herein. This list is not intended to be comprehensive.

- The lateral extent of the impacted groundwater has not been fully delineated to the northwest of Well MW-14.
- The groundwater results, particularly for the newly installed wells, reflect conditions on one particular date. These results are not sufficient to assess potential seasonal fluctuations or long-term trends in contaminant distribution, gradient, or plume stability.
- Additional soil data from the on-Property source area may be useful in accurately mapping the extent and level of remaining contamination. These data may be useful in assessing the viability of certain exposure pathways, including outdoor air and ingestion pathways if the pavement is removed, and determining the need and scope of potential additional remedial action.
- Construction details of the on-Property water well, including total depth, screen interval depth, integrity of the well casing, and well head seal are unknown.
- In addition to the former UST system, the 2012 Phase I ESA identified multiple potential sources of contamination including floor drains, vehicles, underground garage, fuel storage tanks, 55-gallon drums, chemical containers, and surface stains. Analytical soil data from Borings B10, B11, and B12 indicate the absence of gross or extensive contamination at the specific sample locations investigated. However, because soil borings were not advanced at each potential source, other localized contamination may exist. Furthermore, once vehicles, equipment and other stored items are removed from the Property, additional surface stains may be apparent.

- The benzene concentration measured in Sample B10S2 is considered an estimate (J-flagged). Additional uncertainty regarding both the presence and concentration magnitude of benzene in this sample is introduced by the benzene detections in both the laboratory method blank and soil trip blank. If this data point is considered valid, the lateral extent of impacted surface soil for this location has not been established.
- During field activities on May 8, 2013, a site employee reported that about 10 years ago, a municipality employee used “sonar” to identify three USTs that remain on Property. The accuracy of this statement has not been researched.

Note that due to time constraints associated with the property transfer and development, it may not be possible to fully investigate the data gaps in the allotted window.

10.0 SUMMARY AND CONCLUSIONS

Field activities consisted of utility locate meetings; advancing six soil borings and collecting soil samples; installing and developing three groundwater monitoring wells; sampling groundwater and drinking water wells; installing and sampling three sets of two nested soil gas points; laboratory analyses of soil, groundwater, drinking water, and soil gas samples; a level-loop survey of the groundwater monitoring wells; and IDW disposal.

Benzene was detected in shallow soil samples from Borings B10 (Sample B10S2) and B15 (Sample B15S5) at a concentration that exceeds the ADEC Method 2 cleanup level. Remaining COCs, including GRO, DRO, RRO, PAH, PCBs, VOCs, and RCRA metals were either not detected or were measured at concentrations less than the current ADEC Method 2 cleanup levels or naturally-occurring background levels.

Benzene concentrations measured in the May 2013 groundwater samples from Wells MW-3, MW-4, MW-5, and MW-14 exceed the ADEC Table C cleanup levels. The highest levels continue to be measured in the sample from Well MW-3, which also contained concentrations of other COCs greater than cleanup levels. Samples from Wells MW-1, MW-6, MW-9, MW-10, and MW-13 generally did not contain detectable levels of site COCs, and did not contain any levels greater than ADEC Table C standards.

Concentrations of four VOCs were measured in drinking water Sample DW-1 (collected from 1204 Wilshire Avenue), but at concentrations less than drinking water maximum contaminant levels. The sample from the on-site drinking water well did not contain detectable VOC concentrations.

Benzene was detected in the soil gas sample collected from Soil Gas Point SGP-3 at a concentration that exceeds the ADEC benzene target level for shallow soil gas. Target analytes were not detected above ADEC target level in the soil gas samples (SGP-1 and SGP-2) adjacent to the 3607 Spenard Road structure.

Key findings and conclusions, in context of project objectives, are listed below.

- Analytical soil data from Borings B10 through B14 indicate that vadose-zone contamination from the former UST/dispenser source area remains largely confined to the on-Property area in the immediate vicinity of the former USTs and dispensers, noting that prior reports also speculated the soil contamination may extend into the Spenard Road and/or Chugach Way rights-of-way.
- The soil sample collected from 18 to 22 feet bgs in Boring B15 indicates the silt/clay soil stratum at the Property is a competent confining layer that limits vertical contaminant transport.
- A comparison of soil data from Boring B15 and MW-3 suggest that concentrations of petroleum hydrocarbons in the subsurface soil have been reduced within the former UST/dispenser source area, perhaps as a result of the 2001 soil removal action, operation of the SVE/AS system, and/or natural attenuation effects.
- Soil data from Boring B10 suggest the potential presence of benzene contamination in the surface soil at that specific location. In our opinion, this potential contamination is not associated with the former UST/dispenser area, although there may be sufficient questions regarding the data quality of this sample to warrant re-testing.
- Soil samples from Borings B11 and B12 contained detectable COC concentrations at concentrations less than the ADEC cleanup levels. These results do not indicate the presence of wide-spread or ubiquitous contamination associated with other contaminant source(s), at the specific locations investigated.
- Analytical data from the three new groundwater monitoring wells provide additional plume delineation information. Results of the sample from Well MW-10 appear to delineate the contaminant plume up-gradient (southeast) of the former UST/dispenser source area and the sample from Well MW-13 delineates the plume in a direction west/southwest of the Property. However, the 0.0534 mg/L benzene measured in the Well MW-14 groundwater sample suggests the plume's leading edge to the northwest has not been established.

- The CSM was updated to reflect the new analytical soil, groundwater, and soil gas data obtained in May 2013. Based on our analysis, multiple complete or potentially complete exposure pathways exist for current and/or future receptors. However, the risk associated with most pathways is presently mitigated by physical controls (e.g., paved ground surfaces, location of buildings from elevated soil gas levels, etc.), COC concentrations less than applicable ADEC regulated cleanup standards or guidance thresholds, and absence of viable receptors (e.g., no drinking water wells within the impacted groundwater plume). Outdoor air inhalation is the only exposure pathway that is both currently viable based on present site use and building configuration, and does not exhibit the risk mitigation factors listed above, although the paved ground surface may provide some protection. Additional data collection, including quantification of current COC concentrations at the areas exhibiting the highest levels following the 2001 soil removal action, may serve to clarify the risk associated with this pathway.
- Remaining data gaps are listed in Section 9 of this report. If these data gaps are sufficiently addressed through the TBA and/or additional groundwater monitoring, it may be possible to significantly reduce the need, scope, and cost of potential remedial action.

11.0 RECOMMENDATIONS

The May 2013 field work and data interpretation has addressed data gaps, established current groundwater concentrations, and indicated the general absence of additional major environmental concerns stemming from either the spread of soil contamination from the former UST/dispenser source area or from previously uninvestigated potential concerns. In this context, we recommend the following:

1. Provide this report to EPA such that the findings can be incorporated into the TBA, with an emphasis on filling the remaining data gaps identified in Section 9 of this report.
2. Coordinate with project stakeholders to discuss the implication of the study's findings on administrative actions pertinent to the potential property transfer, including a potential PPA, and possibly a revised Compliance Order By Consent (COBC). A central discussion topic will be residual risk to human health at the site, and clarifying the ADEC's perspective on what specific exposure pathways and receptors remain, and how resources should be allocated in a prioritized manner to address these risks and facilitate beneficial land use. This discussion will be used as a basis for establishing the need and scope of additional characterization, monitoring, and remedial action, as warranted.

12.0 CLOSURE/LIMITATIONS

This report is an instrument of service prepared by Shannon & Wilson for the exclusive use of the ADEC, herein referred to as the Client, and its affiliates. The findings we have presented within this report are based on the limited sampling and analyses that we conducted. They should not be construed as definite conclusions regarding the site's soil, groundwater, or soil gas conditions. It is possible that our surface and subsurface tests missed higher levels of target analyte concentrations, although our intention was to sample areas likely to be impacted and in accordance with our ADEC-approved work plan. As a result, the sampling and analyses performed can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information derived from electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report, please contact the undersigned.

Shannon & Wilson has prepared the attachments in Appendix G, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our report. You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore, has not, and will not, disclose the results of this study, except with your permission or as required by law.

We appreciate the opportunity to be of service to you. Please contact the undersigned at (907) 561-2120 with questions or comments concerning this report.

Sincerely,

SHANNON & WILSON, INC.

Jennifer Simmons
Environmental Scientist



Matthew Henry, P.E.
Vice President

DRAFT

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Classification** (see Appendix B)
Soil Samples					
Boring B10					
B10S1	5/2/2013	Southeast corner of 3609 Spenard Road	0-2	1.4	Frozen to medium dense, brown to gray, slightly gravelly, silty SAND; moist
* B10S2	5/2/2013	Southeast corner of 3609 Spenard Road	2-4	4.4	Medium dense, brown, sandy GRAVEL to very stiff, brown to gray, slightly gravelly SILT; moist
* B10S3/B10S7	5/2/2013	Southeast corner of 3609 Spenard Road	4-6	0.7	Loose, brown to gray, gravelly, silty SAND to silty, gravelly SAND; occasional organics from 4.8 feet to 6.0 feet bgs; moist; septic odor
B10S4	5/2/2013	Southeast corner of 3609 Spenard Road	6-8	-	Soft, brown PEAT interbedded with layers of gray sand; moist
B10S5	5/2/2013	Southeast corner of 3609 Spenard Road	8-10	-	Loose to medium dense, brown to gray, slightly silty SAND; wet
B10S6	5/2/2013	Southeast corner of 3609 Spenard Road	11-13	-	Loose to medium dense, brown to gray, slightly silty SAND; wet
Boring B11‡					
* B11S1	5/2/2013	Approximately 10 feet east of car wash building	0.2-2	1.4	Medium dense, brown, slightly gravelly, silty SAND; moist
B11S2	5/2/2013	Approximately 10 feet east of car wash building	2-4	0.7	Medium dense, orange, slightly gravelly silty SAND; moist
B11S3	5/2/2013	Approximately 10 feet east of car wash building	4-6	1.4	Medium dense, brown, slightly gravelly, silty SAND; moist;
B11S4	5/2/2013	Approximately 10 feet east of car wash building	6-8	0.7	Medium dense, gray to orange, slightly gravelly silty SAND to slightly silty, gravelly SAND; moist; lense of red, silty SAND from 7.0 to 7.1 feet bgs
* B11S5	5/2/2013	Approximately 10 feet east of car wash building	8-9	1.4	Dense, gray to orange, slightly gravelly silty SAND; moist to wet at 9.5 feet bgs
Boring B12					
B12S1	5/2/2013	West of the 3607 Spenard Road structure	0.1-2	1.4	Loose, brown, slightly silty, gravelly SAND; moist
* B12S2	5/2/2013	West of the 3607 Spenard Road structure	2-4	3.6	Loose, brown, slightly silty, gravelly SAND; moist
B12S3	5/2/2013	West of the 3607 Spenard Road structure	4-6	2.2	Stiff, brown, sandy SILT to medium dense, brown, slightly silty SAND; moist
B12S4	5/2/2013	West of the 3607 Spenard Road structure	6-8	1.4	Stiff, brown, sandy SILT to medium dense, gray, slightly gravelly SAND; moist
B12S5	5/2/2013	West of the 3607 Spenard Road structure	8-10	2.9	Medium dense, black SAND to brown to orange to red, slightly gravelly to gravelly SAND; moist
* B12S6	5/2/2013	West of the 3607 Spenard Road structure	10-12	2.2	Medium dense, brown to orange to red to gray, slightly gravelly to gravelly SAND; moist
B12S7	5/2/2013	West of the 3607 Spenard Road structure	12-14	-	Medium dense, gray to brown SAND; increasing coarseness with depth; wet at 12 feet bgs

Notes:

* Sample analyzed by the project laboratory (See Appendix D)

** Sample classification applies to the portion of the specified sample interval from which the sample was collected.

^ = field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).

- = measurement not recorded or not applicable

bgs = below ground surface

ppm = parts per million

‡ = Samples identified as B11R on chain of custody form and laboratory report

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Classification** (see Appendix B)
Soil Samples (continued)					
Boring B13					
B13S1	5/2/2013	South of 3608 Spenard Road structure	0-2	2.2	Loose, brown, slightly gravelly, silty SAND to sandy SILT; moist
* B13S2	5/2/2013	South of 3608 Spenard Road structure	2-4	2.9	Loose, brown, slightly gravelly, silty SAND to sandy SILT; moist
B13S3	5/2/2013	South of 3608 Spenard Road structure	4-6	1.4	Loose, brown, slightly gravelly, silty SAND to soft, brown SILT to brown, silty SAND; moist
B13S4	5/2/2013	South of 3608 Spenard Road structure	6-8	2.2	Medium dense, gray, slightly gravelly, silty SAND; moist
B13S5	5/2/2013	South of 3608 Spenard Road structure	8-10	1.4	Medium dense, gray slightly gravelly SAND to brown, silty SAND; moist
* B13S6	5/2/2013	South of 3608 Spenard Road structure	10-12	1.4	Very stiff, brown, sandy SILT to medium dense, brown, slightly gravelly SAND to brown SAND; moist
B13S7	5/2/2013	South of 3608 Spenard Road structure	12-14	-	Medium dense brown, slightly gravelly SAND to gray SAND; wet at 12 feet bgs
B13S8	5/2/2013	South of 3608 Spenard Road structure	14-16	-	Medium dense, gray SAND to gravelly SAND; wet
B13S9	5/2/2013	South of 3608 Spenard Road structure	16-18	-	Medium dense, gray, silty SAND; wet
B13S10	5/2/2013	Duplicate of Sample B13S5	8-10	1.4	Medium dense, gray slightly gravelly SAND to brown, silty SAND; moist
Boring B14					
B14S1	5/3/2013	North of 3608 Spenard Road structure	0.2-2	3.0	Very loose, brown, silty SAND; moist
B14S2	5/3/2013	North of 3608 Spenard Road structure	2-4	1.5	Loose, brown, slightly gravelly SAND to silty SAND to sandy SILT; moist
B14S3	5/3/2013	North of 3608 Spenard Road structure	4-6	1.5	Loose, brown, silty SAND to sandy SILT to medium dense, gray, slightly gravelly SAND; moist
B14S4	5/3/2013	North of 3608 Spenard Road structure	6-8	0.0	Medium dense, gray, slightly gravelly SAND to brown, silty SAND; moist
* B14S5/B14S10	5/3/2013	North of 3608 Spenard Road structure	8-10	3.0	Medium dense, gray to tan to red slightly silty SAND with occasional organics; moist
* B14S6	5/3/2013	North of 3608 Spenard Road structure	10-12	2.2	Medium dense, gray silty SAND to tan to gray SAND; moist
B14S7	5/3/2013	North of 3608 Spenard Road structure	12-14	-	Medium dense, gray SAND to black, slightly silty SAND; wet at 12 feet bgs
B14S8	5/3/2013	North of 3608 Spenard Road structure	14-16	-	Medium dense, gray SAND; lense of gray gravel from 15.8 feet to 16.0 feet bgs; wet
B14S9	5/3/2013	North of 3608 Spenard Road structure	16-18	-	Medium dense, gray, slightly silty SAND to very stiff, sandy SILT with occasional gravel; wet

Notes:

- * = sample analyzed by the project laboratory (See Appendix D)
- ** = sample classification applies to the portion of the specified sample interval from which the sample was collected.
- ^ = field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- = measurement not recorded or not applicable
- bgs = below ground surface
- ppm = parts per million

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Classification** (see Appendix B)
Soil Samples (continued)					
Boring B15					
B15S1	5/3/2013	Southwest corner of 3607 Spenard Road	0.2-2	2.3	Medium dense, brown, slightly silty, gravelly SAND; moist
B15S2	5/3/2013	Southwest corner of 3607 Spenard Road	2-4	1.2	Medium dense, brown, slightly silty, gravelly SAND to brown, sandy SILT to silty
B15S3	5/3/2013	Southwest corner of 3607 Spenard Road	4-6	1.4	Dense, brown silty SAND to sandy SILT to slightly silty, gravelly SAND; moist
B15S4	5/3/2013	Southwest corner of 3607 Spenard Road	6-8	1.4	Very stiff, gray, sandy SILT to medium dense, brown, slightly gravelly SAND; lense of organics from 6.3 feet to 6.4 feet bgs; moist
* B15S5/B15S7	5/3/2013	Southwest corner of 3607 Spenard Road	8-10	36.3	Medium dense, brown, silty SAND to brown to tan SAND interbedded with organic layers; moist
* B15S6	5/3/2013	Southwest corner of 3607 Spenard Road	18-22	0.9	Stiff, gray, silty CLAY; moist
Groundwater Samples					
* MW-1	5/9/2013	Monitoring Well MW-1	9.21	-	Groundwater
* MW-3	5/9/2013	Monitoring Well MW-3	10.46	-	Groundwater; hydrocarbon odor
* MW-4/MW-15	5/9/2013	Monitoring Well MW-4	11.18	-	Groundwater; hydrocarbon odor; sheen on purge water
* MW-5	5/9/2013	Monitoring Well MW-5	10.94	-	Groundwater
* MW-6	5/9/2013	Monitoring Well MW-6	10.35	-	Groundwater
* MW-9	5/8/2013	Monitoring Well MW-9	10.67	-	Groundwater
* MW-10	5/9/2013	Monitoring Well MW-10	4.26	-	Groundwater
* MW-13	5/9/2013	Monitoring Well MW-13	10.68	-	Groundwater
* MW-14	5/9/2013	Monitoring Well MW-14	10.45	-	Groundwater
Drinking Water Samples					
* DW1	5/13/2013	1204 Wilshire Avenue	-	-	Drinking Water Sample
* DW2	5/14/2013	3609 Spenard Road	-	-	Drinking Water Sample
* DW3	5/14/2013	3704 Wilson Street	-	-	Drinking Water Sample

Notes:

* Sample analyzed by the project laboratory (See Appendix D)

** Sample classification applies to the portion of the specified sample interval from which the sample was collected.

^ = field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).

- = measurement not recorded or not applicable

bgs = below ground surface

ppm = parts per million

TABLE 1
SAMPLE LOCATIONS AND DESCRIPTIONS

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Classification** (see Appendix B)
Soil-Gas Samples					
* SGP-1S	5/16/2013	Soil Gas Probe SGP-1, shallow	5.1	0.0	Soil-Gas Sample
* SGP-1D	5/16/2013	Soil Gas Probe SGP-1, deep	10	0.0	Soil-Gas Sample
* SGP-2S/SGP-4S	5/16/2013	Soil Gas Probe SGP-2, shallow	4.6	0.0	Soil-Gas Sample
* SGP-2D	5/16/2013	Soil Gas Probe SGP-2, deep	10	0.0	Soil-Gas Sample
* SGP-3S	5/16/2013	Soil Gas Probe SGP-3, shallow	5	0.0	Soil-Gas Sample
* SGP-3D	5/16/2013	Soil Gas Probe SGP-3, deep	10	0.0	Soil-Gas Sample
Quality Control Samples					
* STB	5/3/2013	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory prior to sampling
* WTB1	5/9/2013	Groundwater Trip Blank	-	-	Organic-free water trip blank prepared in the laboratory
* WTB2	5/9/2013	Groundwater Trip Blank	-	-	Organic-free water trip blank prepared in the laboratory
* DWTB	5/13/2013	Drinking Water Trip Blank	-	-	Organic-free water trip blank prepared in the laboratory

Notes:

* Sample analyzed by the project laboratory (See Appendix D)

** Sample classification applies to the portion of the specified sample interval from which the sample was collected.

^ = field screening instrument was a flame ionization detector (FID).

- = measurement not recorded or not applicable

† = depth to water feet below top of casing

bgs = below ground surface

ppm = parts per million

**TABLE 2
WELL DEVELOPMENT AND SAMPLING LOG**

	Monitoring Well Number										
	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-9	MW-10	MW-13	MW-14	
Water Level Measurement Data											
Date Water Level Measured	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013	5/8/2013
Time Water Level Measured	15:37	15:42	15:48	15:52	15:58	15:20	15:17	15:38	15:27	15:24	15:24
Depth to water (ft below TOC)	8.79	-	10.15	10.96	10.56	10.18	10.41	7.54	10.31	10.10	10.10
Water Level Elevation (ft)	89.48	-	89.23	89.40	88.83	89.31	88.89	94.30	88.71	88.96	88.96
Surveyed TOC Elevation (ft)	98.69	98.28	99.69	100.58	99.77	99.66	99.56	98.56	99.39	99.41	99.41
Height of TOC bgs (ft)	-0.42	-0.38	-0.31	-0.22	-0.38	-0.17	-0.26	3.28	-0.37	-0.35	-0.35
Measured Depth to Water (ft bgs)	9.21	-	10.46	11.18	10.94	10.35	10.67	4.26	10.68	10.45	10.45
Development Data											
Date of Development	-	-	-	-	-	-	-	5/7/2013	5/7/2013	5/7/2013	5/7/2013
Time Development Initiated	-	-	-	-	-	-	-	8:26	10:30	12:50	12:50
Time Development Completed	-	-	-	-	-	-	-	10:21	12:27	14:57	14:57
Development Method	-	-	-	-	-	-	-	SB/SPP	SB/SPP	SB/SPP	SB/SPP
Volume of Water Removed (gallons)	-	-	-	-	-	-	-	51	45	55	55
Purging/Sampling Data											
Date Sampled	5/9/2013	-	5/9/2013	5/9/2013	5/9/2013	5/9/2013	5/8/2013	5/9/2013	5/9/2013	5/9/2013	5/9/2013
Time Sampled	15:01	-	14:41	16:29	16:51	10:45	17:42	12:48	12:22	10:34	10:34
Measured Depth to Water (ft below TOC)	8.76	-	10.14	11.18	10.58	10.14	10.42	7.53	10.30	10.11	10.11
Total Depth of Well (ft below TOC)	15.26	-	16.20	18.75	17.40	18.33	16.90	16.24	17.35	17.59	17.59
Water Column in Well (ft)	6.50	-	6.06	7.79	6.82	8.19	6.48	8.71	7.05	7.48	7.48
Gallons per Foot	0.16	-	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Water Column Volume (gallons)	1.04	-	0.97	1.25	1.09	1.31	1.04	1.39	1.13	1.20	1.20
Volume Pumped (gallons)	2.60	-	1.9	1.8	2.5	2.7	2.3	2.8	1.4	1.8	1.8
Sampling Method	SPP	-	SPP	SPP	SPP	SPP	SPP	SPP	SPP	SPP	SPP
Diameter of Well Casing	2-inch	-	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch	2-inch
Remarks		Blockage at 2 feet below TOC	Hydrocarbon odor	Sheen on purge water	Approximately 1 foot of bentonite/material at bottom of well casing						
Water Quality Data at Time of Sampling											
Temperature (°C)	3.62	-	5.8	4.9	5.53	4.91	5.2	3.48	6.0	4.4	4.4
Specific Conductance (µS/cm)	484	-	575	263	537	288	432	825	295	331	331
Oxidation Reduction Potential (mV)	-25	-	-50	102	-10	20	233	-63	47	-51	-51
pH (Standard Units)	6.29	-	6.96	6.31	6.06	5.51	5.89	6.29	6.66	7.05	7.05
Turbidity (NTU)	6.02	-	20.8	294	35.7	375	32.9	3.94	33.8	226	226

Notes:

Survey conducted by Shannon & Wilson on May 31, 2013.

Water quality parameters were measured with Hanna and YSI field water quality instruments and a Hach Turbidimeter.

- TOC = top of casing
- ft = feet
- °C = degrees Celsius
- ft = feet
- µS/cm = microsiemens per centimeter
- mV = millivolt
- NTU = nephelometric turbidity units
- SB = surge block
- SPP = submersible proactive pump
- bgs = below ground surface

TABLE 3
SOIL SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number [^] and Collection Depth in Feet (See Table 1, Figures 2 and 3, and Appendix D)							
			Boring B10		Boring B11		Boring B12		Boring B13	
			B10S2 2-4	B10S3 4-6	B11S1† 0.2-2	B11S5† 8-9.5	B12S2 2-4	B12S6 10-12	B13S2 2-4	B13S6 10-12
PID Headspace Reading - ppm	580B - PID	-	4.4	0.7	1.4	1.4	3.6	2.2	2.9	1.4
Gasoline Range Organics (GRO) - mg/kg	AK 101	300	<5.79 B	<4.00 B	<2.15 B	<2.14 B	<2.12 B	<2.61 B	<2.70 B	<2.46 B
Diesel Range Organics (DRO) - mg/kg	AK 102	250	77.1 J	60.8 J	103	9.38 J	97.5	<13.0	37.5 J	8.37 J
Residual Range Organics (RRO) - mg/kg	AK 103	10,000	-	-	664	50.3	602	19.1 J	-	-
Aromatic Volatile Organics (BTEX)										
Benzene - mg/kg	EPA 8021B	0.025	0.0284 J	0.0136 J	-	-	-	-	0.00809 J	0.00738 J
Toluene - mg/kg	EPA 8021B	6.5	0.0185 J	<0.0250	-	-	-	-	<0.0168	0.00787 J
Ethylbenzene - mg/kg	EPA 8021B	6.9	<0.0362	<0.0250	-	-	-	-	<0.0168	<0.0153
Xylenes - mg/kg	EPA 8021B	63	0.0260 J	0.0152 J	-	-	-	-	0.0135 J	0.0861 J
Volatile Organic Compounds (VOCs)										
Benzene - mg/kg	EPA8260B	0.025	-	-	<0.0108 B	<0.0107 B	<0.0106 B	<0.0130 B	-	-
Toluene - mg/kg	EPA8260B	6.5	-	-	<0.0134	<0.0134	0.00892 J	<0.0163	-	-
Ethylbenzene - mg/kg	EPA8260B	6.9	-	-	<0.0134	<0.0134	<0.0133	<0.0163	-	-
Xylenes (total) - mg/kg	EPA8260B	63	-	-	<0.0534	<0.0532	<0.0526	0.0180 J	-	-
1,1-Dichloroethene - mg/kg	EPA8260B	0.030	-	-	<0.0215 B	<0.0134	<0.0212 B	<0.0163	-	-
1,2,4-Trimethylbenzene - mg/kg	EPA8260B	23	-	-	<0.0258	<0.0258	0.0147 J	<0.0312	-	-
1,3,5-Trimethylbenzene - mg/kg	EPA8260B	23	-	-	<0.0134	<0.0134	<0.0134	<0.0163	-	-
4-Isopropyltoluene - mg/kg	EPA8260B	-	-	-	<0.0215 B	<0.0214 B	<0.0212 B	<0.0261 B	-	-
Carbon disulfide - mg/kg	EPA8260B	12	-	-	<0.0861 B	<0.0532	<0.0526	<0.0646	-	-
Hexachlorobutadiene - mg/kg	EPA8260B	-	-	-	<0.0430 B	<0.0429 B	<0.0254	<0.0521 B	-	-
Isopropylbenzene - mg/kg	EPA8260B	51	-	-	<0.0134	<0.0134	<0.0212 B	<0.0261 B	-	-
Methylene chloride - mg/kg	EPA8260B	0.21	-	-	<0.0534	<0.0858 B	<0.0849 B	<0.0646	-	-
n-Butylbenzene - mg/kg	EPA8260B	15	-	-	<0.0215 B	<0.0214 B	<0.0212 B	<0.0261 B	-	-
n-Propylbenzene - mg/kg	EPA8260B	-	-	-	<0.0134	<0.0134	<0.0212 B	<0.0261 B	-	-
sec-Butylbenzene - mg/kg	EPA8260B	12	-	-	<0.0215 B	<0.0214 B	<0.0212 B	<0.0261 B	-	-
Tetrachloroethene - mg/kg	EPA8260B	0.024	-	-	<0.0108 B	<0.0107 B	<0.0106 B	<0.0130 B	-	-
trans-1,2-Dichloroethene - mg/kg	EPA8260B	0.37	-	-	<0.0215 B	<0.0214 B	<0.0133	<0.0163	-	-
Trichloroethene - mg/kg	EPA8260B	0.020	-	-	<0.0108 B	<0.0107 B	<0.0106 B	<0.0130 B	-	-
Vinyl chloride - mg/kg	EPA8260B	0.0085	-	-	< 0.0215 B	< 0.0214 B	< 0.0212 B	< 0.0163	-	-
Other VOCs - mg/kg	EPA8260B	varies	-	-	ND	ND	ND	ND	-	-
Polynuclear Aromatic Hydrocarbons (PAHs)										
1-Methylnaphthalene - mg/kg	EPA 8270D SIM	6.2	-	-	0.0152 J	-	0.0304	-	-	-
2-Methylnaphthalene - mg/kg	EPA 8270D SIM	6.1	-	-	0.0152 J	-	0.0330	-	-	-
Acenaphthylene - mg/kg	EPA 8270D SIM	180	-	-	0.00806 J	-	<0.0157	-	-	-
Benzo(a)Anthracene - mg/kg	EPA 8270D SIM	4	-	-	<0.0157	-	0.00897 J	-	-	-
Chrysene - mg/kg	EPA 8270D SIM	360	-	-	<0.0157	-	0.0184 J	-	-	-
Fluorene - mg/kg	EPA 8270D SIM	220	-	-	0.0123 J	-	0.0115 J	-	-	-
Phenanthrene - mg/kg	EPA 8270D SIM	3,000	-	-	0.0600	-	0.0727	-	-	-
Other PAHs - mg/kg	EPA 8270D SIM	Varies	-	-	ND	-	ND	-	-	-
RCRA Metals										
Arsenic - mg/kg	SW 6020	3.9	-	-	5.73	-	5.01	-	-	-
Barium - mg/kg	SW 6020	1,100	-	-	61.0	-	47.9	-	-	-
Cadmium - mg/kg	SW 6020	5	-	-	0.136 J	-	0.203	-	-	-
Chromium - mg/kg	SW 6020	25	-	-	26.5	-	29.3	-	-	-
Lead - mg/kg	SW 6020	-	-	-	9.42	-	20.7	-	-	-
Mercury - mg/kg	SW 6020	1.4	-	-	0.0817	-	0.0977	-	-	-
Selenium - mg/kg	SW 6020	3.4	-	-	0.316 J	-	0.172 J	-	-	-
Silver - mg/kg	SW 6020	11.2	-	-	0.0677 J	-	0.0737	-	-	-
Polychlorinated Biphenyls (PCBs)	SW 8082A	Varies	-	-	ND	-	ND	-	-	-

Notes:

* See Appendix D for compounds tested, methods, and laboratory reporting limits

** Soil cleanup level is the most stringent ADEC Method 2 standard listed in Table B1 or or B2, 18 AAC 75 (April 2012), for the "under 40 inches (precipitation) zone"

[^] Sample ID number preceded by "17525-002" on the chain of custody form

mg/kg = Milligrams per kilogram

<0.0620 = Analyte not detected; laboratory limit of detection of 0.0620 mg/kg

ppm = parts per million

B = Analyte concentration potentially affected by method and/or trip blank contamination. See the Laboratory Data Review Checklist for more details.

<0.0289 = laboratory limit of quantitation exceeds the regulatory cleanup level

0.0284 = Analyte concentration exceeds applicable cleanup criterion

- = Not applicable or sample not tested for this analyte

0.0304 = Analyte detected

J = Estimated concentration detected at a concentration less than the limit of quantitation

ND = Analyte not detected

† = Sample identified as B11RS1 and B11RS5 on chain of custody form and

TABLE 3
SOIL SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number^ and Collection Depth in Feet (See Table 1, Figures 2 and 3, and Appendix D)					
			Boring B14			Boring B15		Quality Control
			B14S5 8-10	B14S10~ 8-10	B14S6 10-12	B15S5 8-10	B15S6 18-22	STB 5/3/2013
PID Headspace Reading - ppm	580B PID	-	3.0	3.0	2.2	36	0.9	-
Gasoline Range Organics (GRO) - mg/kg	AK 101	300	<3.03 B	<2.51 B	<2.72 B	42.4	<3.74 B	<2.50 B
Diesel Range Organics (DRO) - mg/kg	AK 102	250	<14.2	<13.9	<14.4	<12.9	<14.3	-
Aromatic Volatile Organics (BTEX)								
Benzene - mg/kg	EPA 8021B	0.025	<0.00968	<0.00804	<0.00870	0.277	<0.0120	-
Toluene - mg/kg	EPA 8021B	6.5	<0.0189	<0.0157	0.0101 J	3.79	<0.0234	-
Ethylbenzene - mg/kg	EPA 8021B	6.9	<0.0189	<0.0157	<0.0170	1.32	<0.0234	-
Xylenes - mg/kg	EPA 8021B	63	<0.0553	<0.0459	0.0130 J	11.87	0.0239 J	-
Volatile Organic Compounds (VOCs)								
Benzene - mg/kg	EPA8260B	0.025	-	-	-	-	-	<0.0125 B
1,1-Dichloroethene - mg/kg	EPA8260B	0.030	-	-	-	-	-	<0.0250 B
4-Isopropyltoluene - mg/kg	EPA8260B	-	-	-	-	-	-	<0.0250 B
Hexachlorobutadiene - mg/kg	EPA8260B	-	-	-	-	-	-	0.0210 J
Isopropylbenzene - mg/kg	EPA8260B	51	-	-	-	-	-	0.00925 J
Methylene chloride - mg/kg	EPA8260B	0.21	-	-	-	-	-	<0.100 B
n-Butylbenzene - mg/kg	EPA8260B	15	-	-	-	-	-	<0.0250 B
Propylbenzene - mg/kg	EPA8260B	-	-	-	-	-	-	0.00825 J
sec-Butylbenzene - mg/kg	EPA8260B	12	-	-	-	-	-	<0.0250 B
Tetrachloroethene - mg/kg	EPA8260B	0.024	-	-	-	-	-	<0.0125 B
trans-1,2-Dichloroethene - mg/kg	EPA8260B	0.37	-	-	-	-	-	<0.0250 B
Trichloroethene - mg/kg	EPA8260B	0.020	-	-	-	-	-	<0.0125 B
Vinyl chloride - mg/kg	EPA8260B	0.0085	-	-	-	-	-	<0.0250 B
Other VOCs	EPA8260B	varies	-	-	-	-	-	ND

Notes

* Appendix D for compounds tested, methods, and laboratory reporting limits

** Soil cleanup level is the most stringent ADEC Method 2 standard listed in Table B1 or B2, 18 AAC 75 (April 2012), for the "under 40 inches (precipitation) zone"

^ Sample ID number preceded by "17525-002" on the chain of custody form

mg/kg = Milligrams per kilogram

<14.2 = Analyte not detected; laboratory limit of detection of <14.2

B = Analyte concentration potentially affected by method and/or trip blank contamination. See the Laboratory Data Review Checklist for more details.

0.277 = Analyte concentration exceeds applicable cleanup criterion

ND = Analyte not detected

~ = Field duplicate of Sample B14S5

- = Not applicable or sample not tested for this analyte

J = Estimated concentration detected at a concentration less than the limit of quantitation

ppm = parts per million

3.79 = Analyte detected

**TABLE 4
GROUNDWATER SAMPLE ANALYTICAL RESULTS**

Parameter Tested	Method*	Cleanup Level **	Sample Source, ID Number^, and Depth-to-Water in feet below top of casing (See Table 1, Figures 2 and 4, and Appendix D)											Quality Control	
			Monitoring Wells										WTB1	WTB2	
			MW-1	MW-3	MW-4	MW-15~	MW-5	MW-6	MW-9	MW-10	MW-13	MW-14	WTB1	WTB2	
			8.76	10.14	10.96	10.96	10.58	10.14	10.42	7.53	10.30	10.11	-	-	
Gasoline Range Organics (GRO) - mg/L	AK 101	2.2	<0.100 B	49.6	0.360	0.369	<0.155 B	<0.100 B	<0.100 B	<0.100 B	<0.0620	<0.132 B	<0.100 B	<0.100 B	
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	0.485 J	4.76	<0.360	<0.360	<0.360	<0.360	0.200 J	0.832	<0.360	<0.360	-	-	
Aromatic Volatile Organics (BTEX)															
Benzene - mg/L	EPA 8021B	0.005	-	-	-	-	0.0674	-	<0.000300	-	<0.000300	0.0542	<0.000300	-	
Toluene - mg/L	EPA 8021B	1	-	-	-	-	<0.000620	-	<0.000620	-	<0.000620	<0.000620	0.000450 J	-	
Ethylbenzene - mg/L	EPA 8021B	0.7	-	-	-	-	<0.000620	-	<0.000620	-	<0.000620	<0.000620	<0.000620	-	
Xylenes (total) - mg/L	EPA 8021B	10	-	-	-	-	<0.00100 B	-	<0.00186	-	<0.00100 B	<0.000730 B	0.000410 J	-	
Volatile Organic Compounds (VOCs)															
Benzene - mg/L	EPA 8260B	0.005	<0.000240	0.658	0.114	0.107	-	<0.000240	-	<0.000240	-	-	-	<0.000240	
Toluene - mg/L	EPA 8260B	1	<0.000620	2.74	0.00619	0.00603	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
Ethylbenzene - mg/L	EPA 8260B	0.7	<0.000620	3.43	0.00533	0.00578	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
Xylenes - mg/L	EPA 8260B	10	<0.00188	16.4	0.0260	0.0279	-	<0.00188	-	<0.00188	-	-	-	<0.00188	
1,2,4-Trimethylbenzene - mg/L	EPA 8260B	1.8	<0.000620	1.83	0.00282	0.00388	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
1,2-Dichloroethane - mg/L	EPA 8260B	0.005	<0.000300	0.0171	<0.000300	<0.000300	-	<0.000300	-	<0.000300	-	-	-	<0.000300	
1,3,5-Trimethylbenzene - mg/L	EPA 8260B	1.8	<0.000620	0.518	0.000970 J	0.00129	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
2-Butanone (MEK) - mg/L	EPA 8260B	22	<0.00620	0.0996	<0.00620	<0.00620	-	0.137	-	<0.00620	-	-	-	<0.00620	
4-isopropyltoluene - mg/L	EPA 8260B	-	<0.000620	0.0224	<0.000620	0.000410 J	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
Isopropylbenzene - mg/L	EPA 8260B	3.7	<0.000620	0.142	0.000490 J	0.000540 J	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
n-propylbenzene - mg/L	EPA 8260B	0.37	<0.000620	0.224	<0.000620	0.000310 J	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
Naphththalene - mg/L	EPA 8260B	0.73	<0.00124	0.0940 J	<0.00124	<0.00124	-	<0.00124	-	<0.00124	-	-	-	<0.00124	
sec-Butylbenzene - mg/L	EPA 8260B	-	<0.000620	<0.000620	<0.000620	0.000340 J	-	<0.000620	-	<0.000620	-	-	-	<0.000620	
Other VOCs - mg/L	EPA 8260B	varies	ND	ND	ND	ND	-	ND	-	ND	-	-	-	ND	

Notes:

- * See Appendix D for compounds tested, methods, and laboratory reporting limits
- ** Groundwater cleanup level is the applicable standard listed in Table C, 18 AAC 75 (April 2012)
- ^ = Sample ID No. preceded by "17525-002-" on the chain of custody form
- ~ = Field duplicate of Sample MW-4
- mg/L = Milligrams per liter
- <0.360 = Analyte not detected; laboratory limit of detection of 0.360 mg/L
- 49.6** = Analyte concentration exceeds applicable cleanup criterion
- = Not applicable or sample not tested for this analyte
- J = Estimated concentration detected at a concentration less than the limit of quantitation
- B = Analyte concentration potentially affected by water trip blank and/or method blank contamination. See the Laboratory Data Review Checklist for more details.
- ND = Analyte not detected
- 0.360** = Analyte detected

TABLE 5
DRINKING WATER SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level / MCL **	Sample ID Number^ (See Table 1, Figure 5, and Appendix D)			
			Drinking Water			Quality Control
			DW-1	DW-2	DW-3	DWTB
Gasoline Range Organics (GRO) - mg/L	AK 101	2.2	<0.100 B	<0.100 B	<0.100 B	<0.100 B
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	<0.372	<0.360	<0.368	-
Volatile Organic Compounds (VOCs)						
Bromodichloromethane - mg/L	EPA 524.2	0.010	0.000610	<0.000300	<0.000300	<0.000300
Chloroform - mg/L	EPA 524.2	-	0.00531	<0.000300	<0.000300	<0.000300
Chloromethane - mg/L	EPA 524.2	0.066	0.000360	<0.000300	<0.000300	<0.000300
Hexachlorobutadiene - mg/L	EPA 524.2	0.0073	<0.000300	<0.000300	<0.000300	0.000230 J
Total Trihalomethanes - mg/L	EPA 524.2	7.441	0.00592	<0.00120	<0.00120	<0.00120
Xylenes -mg/L	EPA 524.2	10	0.000190 J	<0.000620	<0.000620	<0.000620
Other VOCs -mg/L	EPA 524.2	varies	ND	ND	ND	ND

Notes:

* See Appendix D for compounds tested, methods, and laboratory reporting limits

** Drinking water maximum contaminant levels (MCLs) adopted by reference in 18 AAC 80.300.

^ = Sample ID No. preceded by "17525-002-" on the chain of custody form

mg/L = Milligrams per liter

<0.372 = Analyte not detected; laboratory limit of detection of 0.372 mg/L

- = Not applicable or sample not tested for this analyte

B = Analyte concentration potentially affected by trip blank and/or method blank contamination. See the Laboratory Data Review Checklist for more details.

J = Estimated concentration detected at a concentration less than the limit of quantitation

ND = Analyte not detected

TABLE 6
SOIL GAS SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Target Levels (µg/m ³)		Sample ID Number^ and Collection Depth in Feet (See Table 1, Figure 2, and Appendix D)						
		Shallow Soil Gas **	Deep Soil Gas **	SGP-1S	SGP-1D	SGP-2S	SGP-4S~	SGP-2D	SGP-3S	SGP-3D
				5.1	10	4.6	4.6	10	5	10
Oxygen - percent	ASTM D-1946	-	-	20	21	20	20	19	20	19
Methane -percent	ASTM D-1946	-	-	<0.00015	0.00017	<0.00015	<0.00015	<0.00014	0.00031	0.00027
Carbon Dioxide - percent	ASTM D-1946	-	-	0.34	0.048	0.093	0.097	0.88	0.38	0.46
Helium - precent	ASTM D-1946	-	-	<0.076	<0.078	<0.074	<0.076	<0.072	<0.078	<0.082
Volatile Organic Compounds (VOCs)										
Acetone - µg/m ³	EPA TO-15 SIM	1,350,000	13,500,000	6.0	9.2	7.6	5.9	16	<19	5.3
1,3-Butadiene - µg/m ³	EPA TO-15 SIM	41	410	<0.34	<0.34	0.5	<0.34	<0.32	<3.5	<0.36
Benzene - µg/m ³	EPA TO-15 SIM	160	1,600	<0.24	1.2	4.9	4.7	0.86	530	40
Cumene - µg/m ³	EPA TO-15 SIM	17,500	175,000	<0.75	<0.76	3.2	4.0	1.2	<7.7	2.7
Chloromethane - µg/m ³	EPA TO-15 SIM	3,900	39,000	<0.31	0.91	<0.30	<0.32	<0.30	<3.2	<0.34
Cyclohexane - µg/m ³	EPA TO-15 SIM	263,000	2,630,000	<0.52	1.0	11	11	1.7	54	41
1,2-Dichloroethane - µg/m ³	EPA TO-15 SIM	47	470	<0.12	0.14	1.1	1.1	0.18	21	2.6
Ethanol - µg/m ³	EPA TO-15 SIM	-	-	<1.4	1.8	3.3	2.2	2.8	<15	<1.5
Ethylbenzene - µg/m ³	EPA TO-15 SIM	490	4,900	0.99	1.1	7.4	8.8	2.6	52	25
4-Ethyltoluene - µg/m ³	EPA TO-15 SIM	-	-	3.9	5.0	16	22	8.3	44	16
Freon 11 - µg/m ³	EPA TO-15 SIM	30,700	307,000	1.7	1.6	1.8	1.7	1.8	<8.8	1.4
Freon 12 - µg/m ³	EPA TO-15 SIM	4,400	44,000	3.1	3.0	3.7	3.4	4.0	10	9.2
Heptane - µg/m ³	EPA TO-15 SIM	-	-	0.68	1.6	11	13	3.0	17	27
Hexane - µg/m ³	EPA TO-15 SIM	30,700	307,000	<0.54	1.2	5.0	5.7	1.6	19	11
2-Propanol - µg/m ³	EPA TO-15 SIM	-	-	<1.9	<1.9	2.4	<1.9	<1.8	<19	<2.0
Propylbenzene - µg/m ³	EPA TO-15 SIM	43,800	438,000	0.80	0.85	3.0	3.5	1.5	10	3.8
Tetrachloroethene - µg/m ³	EPA TO-15 SIM	1,800	18,000	29	2.7	4.6	5.2	73	6.6	4.1
Toluene - µg/m ³	EPA TO-15 SIM	219,000	2,190,000	1.4	5.8	10	11	3.7	310	59
Trichloroethene - µg/m ³	EPA TO-15 SIM	88	880	1.3	1.2	11	1.4	1.4	<1.7	0.71
1,2,4-Trimethylbenzene - µg/m ³	EPA TO-15 SIM	310	3,100	4.6	3.2	16	21	8.2	56	9.1
1,3,5-Trimethylbenzene - µg/m ³	EPA TO-15 SIM	310	3,100	3.7	2.2	14	19	8.0	31	6.8
2,2,4-Trimethylpentane - µg/m ³	EPA TO-15 SIM	-	-	<3.6	<3.6	4.2	4.7	<3.4	<37	28
1,1,1- Trichloroethane - µg/m ³	EPA TO-15 SIM	219,000	2,190,000	<0.16	<0.17	0.41	<0.17	<0.16	<1.7	<0.18
Xylenes - µg/m ³	EPA TO-15 SIM	4,400	44,000	11.0	6.9	91	111	29	310	146
Other VOCs - µg/m ³	EPA TO-15 SIM	varies	varies	ND	ND	ND	ND	ND	ND	ND

Notes:

* See Appendix D for compounds tested, methods, and laboratory reporting limits

** Target soil gas levels are listed in Appendix E and F of the ADEC Vapor Intrusion Guidance for commercial site use (October 2012). Note shallow soil gas is defined as gas collected from 5 feet or less below the ground and deep shallow gas is defined as gas collected more than 5 feet below the ground surface.

^ =Sample ID No. preceded by "17525-002" on the chain of custody form

~ =Duplicate of Sample SGP-2S

530 =Indicates analyte exceeds the applicable cleanup criterionµg/m³ = Micrograms per cubic meter

- = Not applicable

<0.34 = Analyte not detected; laboratory limit of detection of 0.34 µg/m³

ND = Not detected

20 = Analyte detected

TABLE 7
SUMMARY OF HISTORICAL GROUNDWATER DATA

Monitoring Well	Date	Parameter Tested and Cleanup Level (mg/L)					
		GRO 1.3	DRO 1.5	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10.0
MW-1	5/29/1996	ND	47.4	ND	ND	ND	ND
	11/18/1996	0.023	0.704	ND	0.001	ND	0.001
	5/9/1997	ND	0.193	ND	ND	ND	ND
	7/8/1997	-	-	-	-	-	-
	2/20/1998	ND	0.15	ND	ND	ND	ND
	6/17/1998	ND	0.16	ND	ND	ND	ND
	5/17/2000	ND	ND	ND	ND	ND	ND
	8/26/2002	-	-	-	-	-	-
	1/23/2003	-	-	-	-	-	-
	4/10/2003	0.229	0.591	0.107	ND	ND	ND
	8/28/2003	-	-	-	-	-	-
	6/14/2006	-	-	-	-	-	-
	6/18/2009	-	-	-	-	-	-
	5/9/2013	<0.100 B	0.485 J	<0.000240	<0.000620	<0.000620	<0.00188
MW-2	5/29/1996	9.860	0.81	0.136	0.175	0.648	3.150
	11/18/1996	0.626	0.81	0.045	0.006	0.00600	0.152
	5/9/1997	0.870	0.49	0.019	0.008	0.084	0.312
	8/21/1997	1.400	0.92	0.039	0.006	0.128	0.378
	11/7/1997	1.140	1.7	0.021	ND	0.076	0.220
	2/20/1998	0.840	1.55	0.005	ND	0.045	0.127
	6/17/1998	0.440	1.86	0.003	ND	0.032	0.155
	5/17/2000	0.140	0.001	0.002	ND	0.004	0.008
	8/31/2000	0.193	3.53	0.002	ND	0.004	0.012
	1/5/2001	0.375	2.31	0.002	ND	0.005	0.017
	4/27/2001	0.522	1.36	0.002	ND	0.007	0.017
	10/30/2001	56.3	2.49	4.92	10.20	1.99	10.80
	5/9/2002	73.6	2.01	0.119	5.10	5.27	24.8
	8/26/2002	38.0	1.24	0.080	0.773	3.26	15.03
	1/23/2003	26.6	2.05	0.050	0.300	1.47	5.81
	4/10/2003	30.1	1.32	0.060	0.100	2.06	8.11
	6/14/2006	0.749	0.405	0.036	ND	0.076	0.083
	6/18/2009	0.335	0.001	0.007	ND	0.013	0.029
5/9/2013	-	-	-	-	-	-	
MW-3	5/29/1996	231	4.04	35.2	44.3	7.00	35.3
	11/18/1996	197	6.71	32.6	37.6	6.60	32.5
	5/9/1997	190	8.12	26.4	31.3	6.50	31.5
	7/8/1997	-	-	-	-	-	-
	8/21/1997	210	11.7	29.4	39.8	6.70	34.3
	11/7/1997	159	13.0	20.0	24.0	5.30	26.0
	2/20/1998	240	36.0	24.0	29.0	5.70	26.0
	6/17/1998	180	17.7	19.0	25.0	5.50	26.0
	5/17/2000	220	8.76	30.8	37.2	6.50	30.1
	8/31/2000	187	9.12	14.5	17.7	3.70	18.2
	1/5/2001	211	11.3	21.7	34.5	6.30	29.5
	4/27/2001	202	11.7	18.8	28.7	5.30	24.8
	10/30/2001	126	7.80	15.0	23.8	4.30	19.8
	5/9/2002	187	3.41	6.58	25.5	6.00	25.8
	8/26/2002	115	3.82	1.98	18.4	4.19	18.7
	1/23/2003	50.9	3.12	0.389	5.78	2.21	9.12
	4/10/2003	40.2	1.87	0.438	5.77	1.83	7.78
	8/28/2003	0.001	2.28	0.001	2.73	0.892	5.29
	6/14/2006	11.6	1.44	0.068	0.092	0.716	3.32
6/18/2009	49.0	3.85	0.126	ND	1.64	6.84	
5/9/2013	49.6	4.76	0.658	2.74	3.43	16.4	

See Table 7, page 3 of 3 for notes

TABLE 7
SUMMARY OF HISTORICAL GROUNDWATER DATA

Monitoring Well	Date	Parameter Tested and Cleanup Level (in mg/L)					
		GRO 1.3	DRO 1.5	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10.0
MW-4	7/8/1997	ND	1.07	0.001	ND	ND	ND
	8/21/1997	ND	0.51	ND	ND	ND	ND
	11/7/1997	ND	0.28	ND	ND	ND	ND
	2/20/1998	ND	0.26	ND	ND	ND	ND
	6/17/1998	ND	0.27	ND	ND	ND	ND
	5/17/2000	ND	ND	ND	ND	ND	ND
	8/31/2000	-	-	-	-	-	-
	1/5/2001	-	-	-	-	-	-
	4/27/2001	-	-	-	-	-	-
	10/30/2001	ND	0.52	ND	ND	ND	ND
	5/9/2002	ND	ND	0.002	ND	ND	ND
	8/26/2002	-	-	-	-	-	-
	1/23/2003	-	-	-	-	-	-
	4/10/2003	1.06	2.27	0.230	0.051	0.027	0.108
	8/28/2003	-	-	-	-	-	-
	6/14/2006	-	-	-	-	-	-
	6/18/2009	1.72	ND	0.470	ND	ND	ND
5/9/2013^	0.369	<0.360	0.114	0.00619	0.00578	0.0279	
MW-5	7/8/1997	ND	2.37	0.007	0.003	ND	ND
	8/21/1997	ND	0.26	0.001	0.002	ND	0.002
	11/7/1997	ND	0.30	ND	ND	ND	ND
	2/20/1998	ND	0.13	ND	ND	ND	ND
	6/17/1998	0.059	0.14	ND	0.002	0.002	0.007
	5/17/2000	ND	ND	ND	ND	ND	ND
	8/31/2000	ND	ND	0.002	ND	ND	ND
	1/5/2001	ND	0.33	ND	ND	ND	ND
	4/27/2001	ND	ND	ND	ND	ND	ND
	10/30/2001	ND	0.46	ND	ND	ND	ND
	5/9/2002	130	1.56	7.07	33.6	5.96	28.49
	8/26/2002	126	2.12	4.48	23.5	6.62	33.8
	1/23/2003	120	2.17	1.88	16.8	4.80	22.05
	4/10/2003	92.0	1.34	1.40	11.0	4.57	22.13
	8/28/2003	118	ND	1.330	8.22	4.43	26.00
	6/14/2006	31.5	2.21	0.306	0.204	2.01	9.83
	6/18/2009	6.14	ND	0.173	ND	0.128	1.070
5/9/2013	<1.55 B	<0.360	0.0674	<0.000620	<0.000620	<0.00100 B	
MW-6	7/8/1997	ND	4.09	ND	ND	ND	ND
	8/21/1997	-	-	-	-	-	-
	11/7/1997	ND	0.205	ND	ND	ND	ND
	2/20/1998	ND	0.130	ND	ND	ND	ND
	6/17/1998	ND	0.170	ND	0.001	ND	0.003
	5/17/2000	ND	ND	ND	ND	ND	ND
	8/31/2000	-	-	-	-	-	-
	1/5/2001	-	-	-	-	-	-
	4/27/2001	-	-	-	-	-	-
	10/30/2001	ND	0.151	ND	ND	ND	ND
	5/9/2002	ND	ND	ND	ND	ND	ND
	8/26/2002	-	-	-	-	-	-
	1/23/2003	-	-	-	-	-	-
	4/10/2003	ND	ND	ND	ND	ND	ND
	8/28/2003	-	-	-	-	-	-
	6/14/2006	-	-	-	-	-	-
	5/9/2013	<0.100 B	<0.360	<0.000240	<0.000620	<0.000620	<0.00188

See Table 7, page 3 of 3 for notes

**TABLE 7
SUMMARY OF HISTORICAL GROUNDWATER DATA**

Monitoring Well	Date	Parameter Tested and Cleanup Level (in mg/L)					
		GRO 1.3	DRO 1.5	Benzene 0.005	Toluene 1.0	Ethylbenzene 0.7	Xylenes 10.0
MW-7	10/30/2001	ND	0.473	ND	ND	ND	ND
	5/9/2002	0.114	ND	0.023	ND	0.003	0.028
	8/26/2002	0.192	ND	0.036	ND	0.027	0.031
	1/23/2003	ND	ND	0.004	ND	0.006	0.009
	4/10/2003	-	-	-	-	-	-
	8/28/2003	-	-	-	-	-	-
	6/14/2006	-	-	-	-	-	-
	6/18/2009	ND	ND	ND	ND	ND	ND
5/9/2013							
MW-8	4/10/2003	0.498	ND	ND	ND	ND	ND
	8/28/2003	-	-	-	-	-	-
	6/14/2006	-	-	-	-	-	-
	6/18/2009	-	-	-	-	-	-
	5/9/2013						
MW-9	4/10/2003	0.840	0.730	0.631	ND	ND	ND
	8/28/2003	0.295	ND	0.110	ND	ND	ND
	6/14/2006	-	-	-	-	-	-
	6/18/2009	ND	ND	ND	ND	ND	ND
	5/8/2013	<0.100 B	0.200 J	<0.000300	<0.000620	<0.000620	<0.00186
MW-10	5/9/2013	<0.100 B	0.832	<0.000240	<0.000620	<0.000620	<0.00188
MW-13	5/9/2013	<0.0620	<0.360	<0.000300	<0.000620	<0.000620	<0.00100 B
MW-14	5/9/2013	<0.132 B	<0.360	0.0542	<0.000620	<0.000620	<0.000730 B

Notes:

Water level elevations and sample concentrations measured prior to May 2013 are reported by others

mg/L = milligrams per liter

<0.0620 = analyte not detected; laboratory reporting limit of was 0.0620 mg/L

^ = higher analytical result of the sample and duplicate

- = not applicable or sample not tested for this parameter

0.144 = analyte detected

0.023 = reported concentration exceeds the regulated cleanup level

J = estimated concentration detected at a concentration less than the limit of quantitation

B = analyte concentration potentially affected water trip blank and/or method blank contamination. See the La

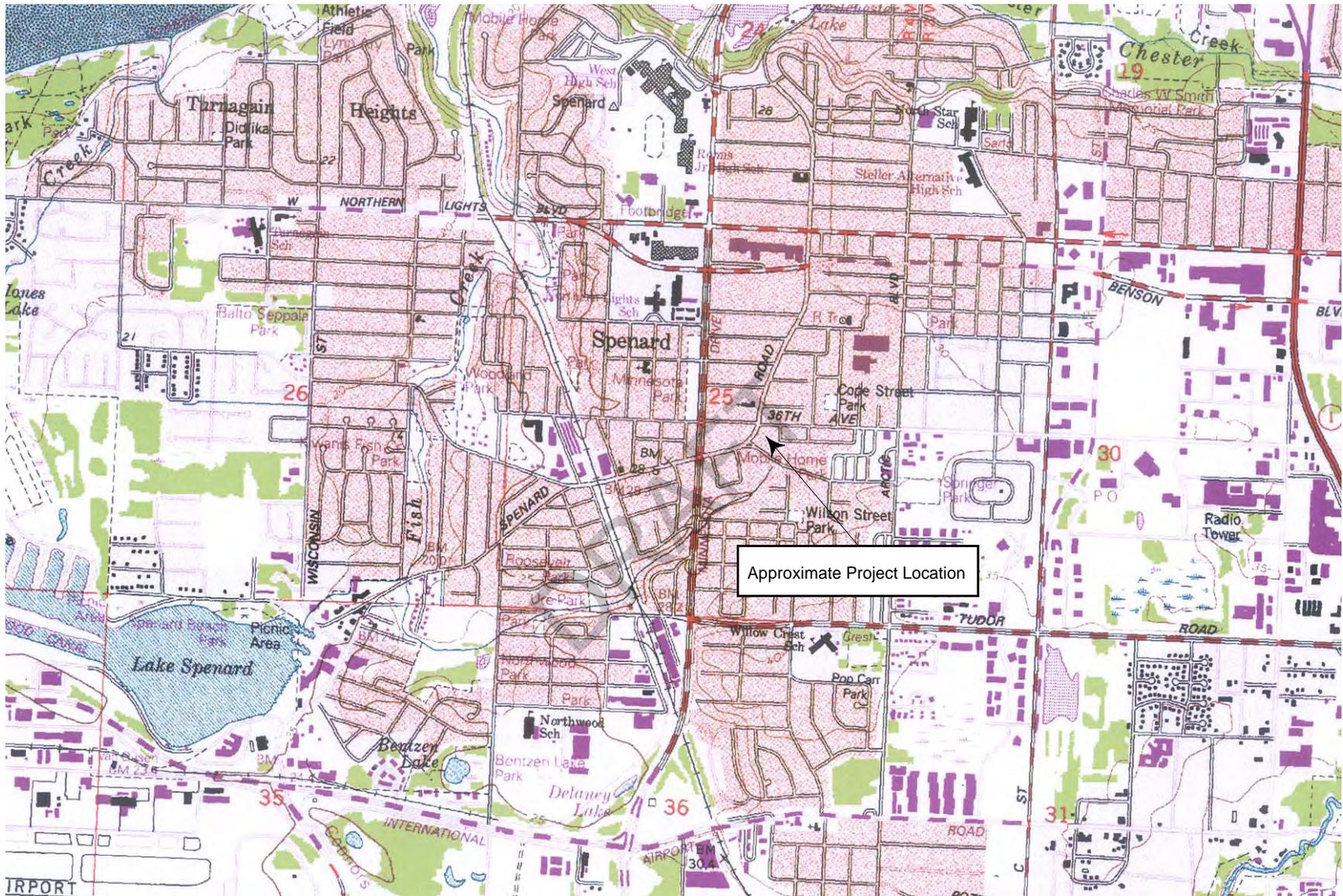
ND = analyte not detected

TABLE 8
QUALITY CONTROL DATA

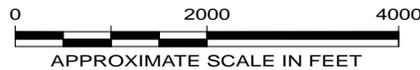
Parameter	Primary Sample	Duplicate Sample	Precision (RPD)	Precision DQO
Boring B14 Soil Samples				
Gasoline Range Organics (GRO) - mg/kg	Sample B14S6 <3.03 B	Sample B14S10 <2.51 B	NA	50%
Diesel Range Organics (DRO) - mg/kg	<14.2	<13.9	NA	50%
Aromatic Volatile Organics (BTEX)				
Benzene - mg/kg	<0.00968	<0.00804	NA	50%
Toluene - mg/kg	<0.0189	<0.0157	NA	50%
Ethylbenzene - mg/kg	<0.0189	<0.0157	NA	50%
Xylenes - mg/kg	<0.0553	<0.0459	NA	50%
Monitoring Well MW-4 Groundwater Samples				
Gasoline Range Organics (GRO) - mg/L	Sample MW-4 0.360	Sample MW-15 0.369	2%	30%
Diesel Range Organics (DRO) - mg/L	<0.360	<0.360	NA	30%
Volatile Organic Compounds (VOCs)				
Benzene - mg/L	0.114	0.107	6%	30%
Toluene - mg/L	0.00619	0.00603	3%	30%
Ethylbenzene - mg/L	0.00533	0.00578	8%	30%
Xylenes - mg/L	0.0260	0.0279	7%	30%
1,2,4-Trimethylbenzene - mg/L	0.00282	0.00388	32%	30%
1,2-Dichloroethane - mg/L	<0.000300	<0.000300	NA	30%
1,3,5-Trimethylbenzene - mg/L	0.000970 J	0.00129	28%	30%
2-Butanone (MEK) - mg/L	<0.00620	<0.00620	NA	30%
4-isopropyltoluene - mg/L	<0.000620	0.000410 J	NA	30%
Isopropylbenzene - mg/L	0.000490 J	0.000540 J	10%	30%
n-propylbenzene - mg/L	<0.000620	0.000310 J	NA	30%
Naphthalene - mg/L	<0.00124	<0.00124	NA	30%
sec-Butylbenzene - mg/L	<0.000620	0.000340 J	NA	30%
Soil Gas Point SGP 2 Soil Gas Samples				
Oxygen - %	Sample SGP-2S 20	Sample SGP-4S 20	0%	25%
Methane - %	<0.00015	<0.00015	NA	25%
Carbon Dioxide - %	0.093	0.097	4%	25%
Helium - %	<0.074	<0.076	NA	25%
Volatile Organic Compounds (VOCs)				
Acetone - µg/m ³	7.6	5.9	25%	25%
1,3-Butadiene - µg/m ³	0.50	<0.34	NA	25%
Benzene - µg/m ³	4.9	4.7	4%	25%
Cumene - µg/m ³	3.2	4.0	22%	25%
Chloromethane - µg/m ³	<0.30	<0.32	NA	25%
Cyclohexane - µg/m ³	11.0	11.0	0%	25%
1,2-Dichloroethane - µg/m ³	1.1	1.1	0%	25%
Ethanol - µg/m ³	3.3	2.2	40%	25%
Ethylbenzene - µg/m ³	7.4	8.8	17%	25%
4-Ethyltoluene - µg/m ³	16	22	32%	25%
Freon 11 - µg/m ³	1.8	1.7	6%	25%
Freon 12 - µg/m ³	3.7	3.4	8%	25%
Heptane - µg/m ³	11	13	17%	25%
Hexane - µg/m ³	5.0	5.7	13%	25%
2-Propanol - µg/m ³	2.4	<1.9	NA	25%
Propylbenzene - µg/m ³	3.0	3.5	15%	25%
Tetrachloroethene - µg/m ³	4.6	5.2	12%	25%
Toluene - µg/m ³	10	11	10%	25%
Trichloroethene - µg/m ³	11	1.4	155%	25%
1,2,4-Trimethylbenzene - µg/m ³	14	21	40%	25%
1,3,5-Trimethylbenzene - µg/m ³	16	19	17%	25%
2,2,4-Trimethylpentane - µg/m ³	4.2	4.7	11%	25%
1,1,1-Trichloroethane - µg/m ³	0.41	<0.17	NA	25%
Xylenes - µg/m ³	91.0	111	20%	25%

Notes:

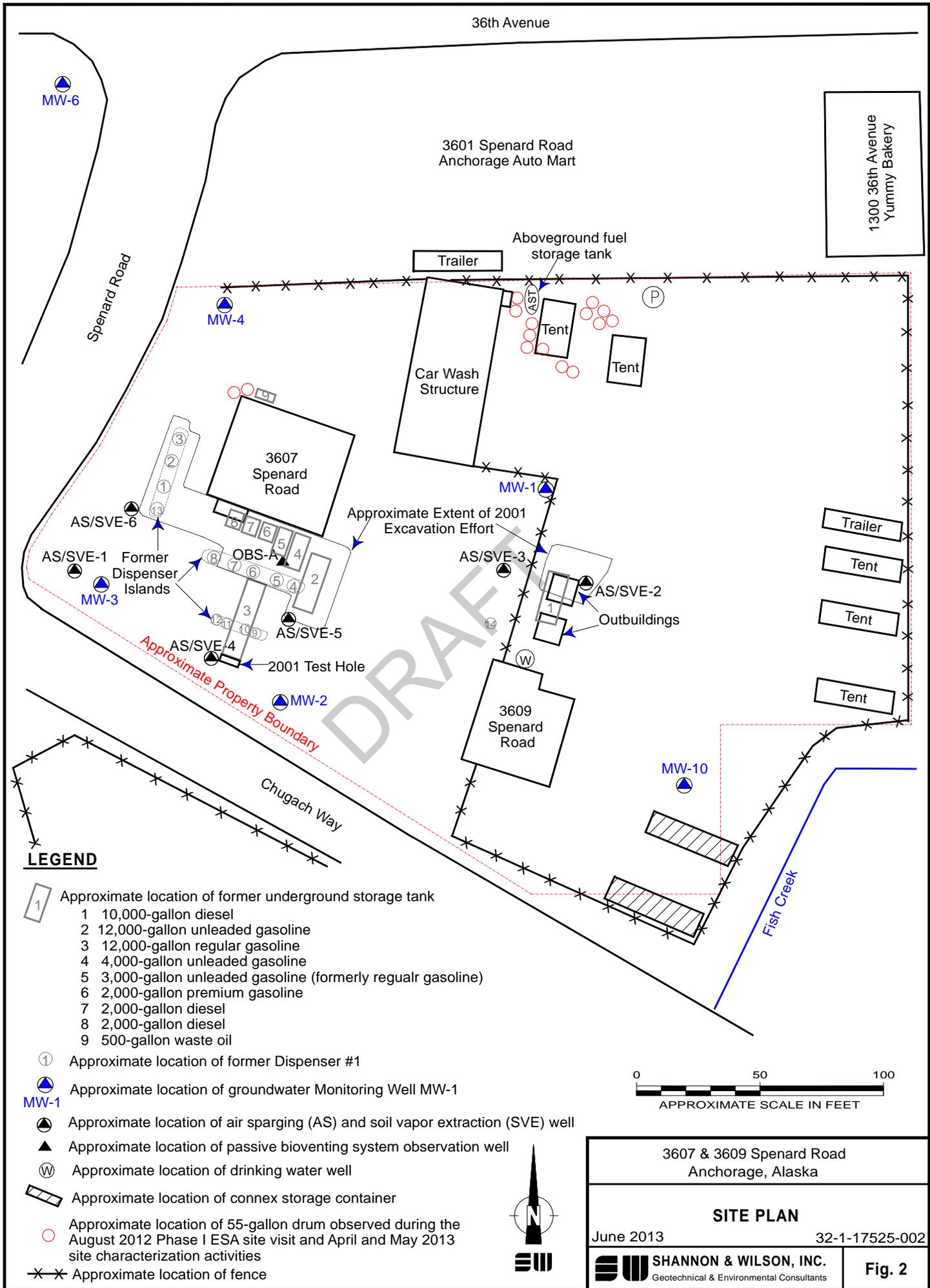
- 32%** Shading and bold indicates that relative percent difference is greater than the quality control limit.
- RPD = relative percent difference
- mg/kg = milligrams per kilogram
- mg/L = milligrams per liter
- NA = RPDs were not calculated due to non-detect or below laboratory reporting limits results
- DQO = data quality objective
- J = Estimated concentration detected at a concentration less than the limit of quantitation
- B = Analyte concentration potentially affected by water trip blank and/or method blank contamination. See the Laboratory Data Review Checklist for m
- µg/m³ = Microgram per cubic meter



Elevation in Meters
 Contour Interval 5 Meters
 Taken from Anchorage A-8 NW
 U.S. Geological Survey Quadrangle (1994)

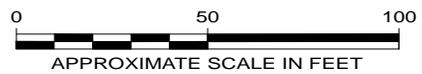


3607 & 3609 Spenard Road Anchorage, Alaska	
VICINITY MAP	
June 2013	32-1-17525-002
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	Fig. 1

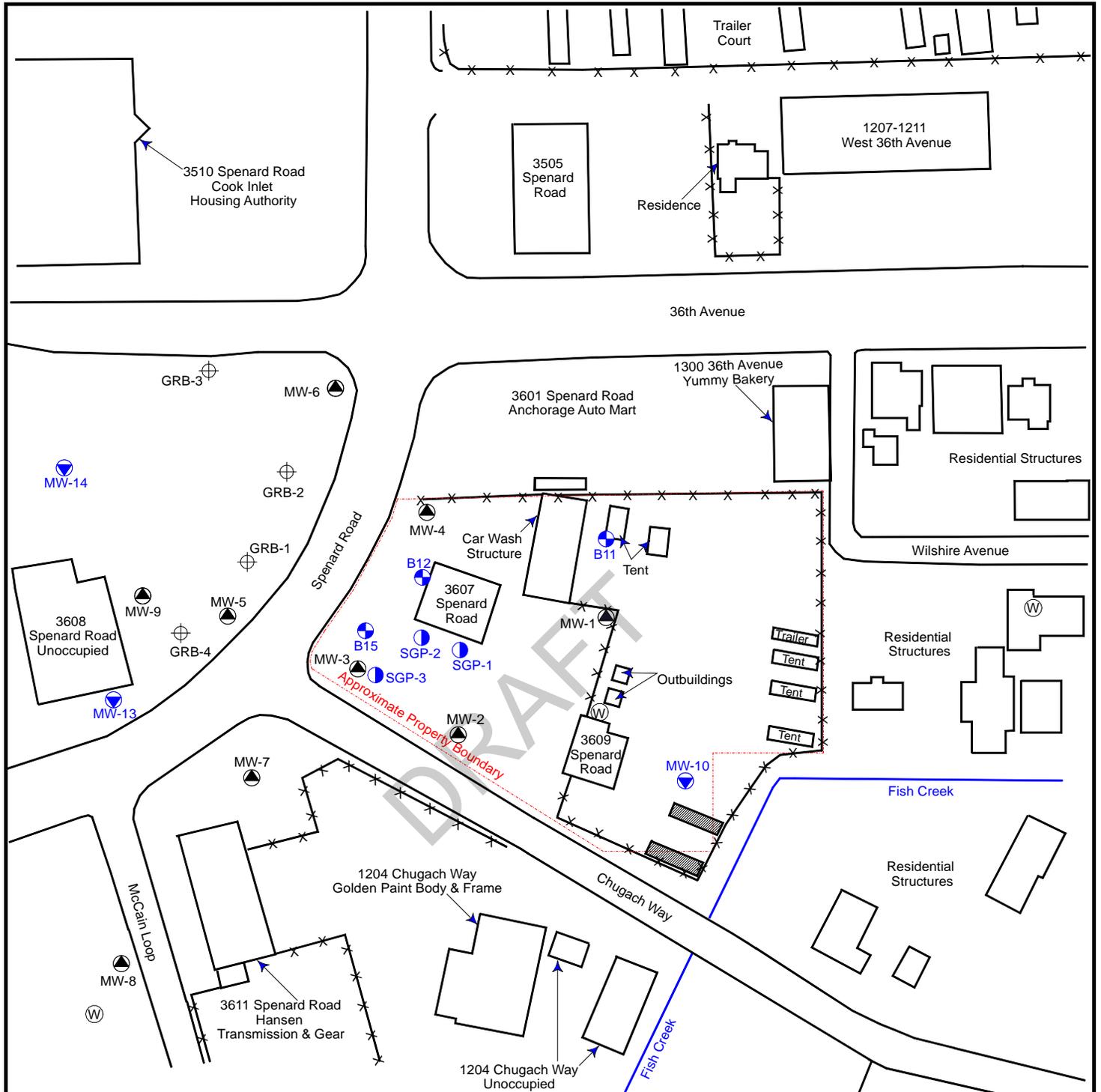


LEGEND

- 1 [Numbered box] Approximate location of former underground storage tank
 - 1 10,000-gallon diesel
 - 2 12,000-gallon unleaded gasoline
 - 3 12,000-gallon regular gasoline
 - 4 4,000-gallon unleaded gasoline
 - 5 3,000-gallon unleaded gasoline (formerly regular gasoline)
 - 6 2,000-gallon premium gasoline
 - 7 2,000-gallon diesel
 - 8 2,000-gallon diesel
 - 9 500-gallon waste oil
- ① Approximate location of former Dispenser #1
- MW-1 [Monitoring Well Symbol] Approximate location of groundwater Monitoring Well MW-1
- [AS/SVE Symbol] Approximate location of air sparging (AS) and soil vapor extraction (SVE) well
- [Bioventing Symbol] Approximate location of passive bioventing system observation well
- [Well Symbol] Approximate location of drinking water well
- [Connex Symbol] Approximate location of connex storage container
- [Drum Symbol] Approximate location of 55-gallon drum observed during the August 2012 Phase I ESA site visit and April and May 2013 site characterization activities
- [Fence Symbol] Approximate location of fence

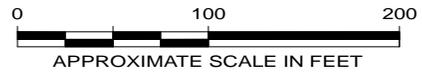


3607 & 3609 Spenard Road Anchorage, Alaska	
SITE PLAN	
June 2013	32-1-17525-002
SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	
Fig. 2	

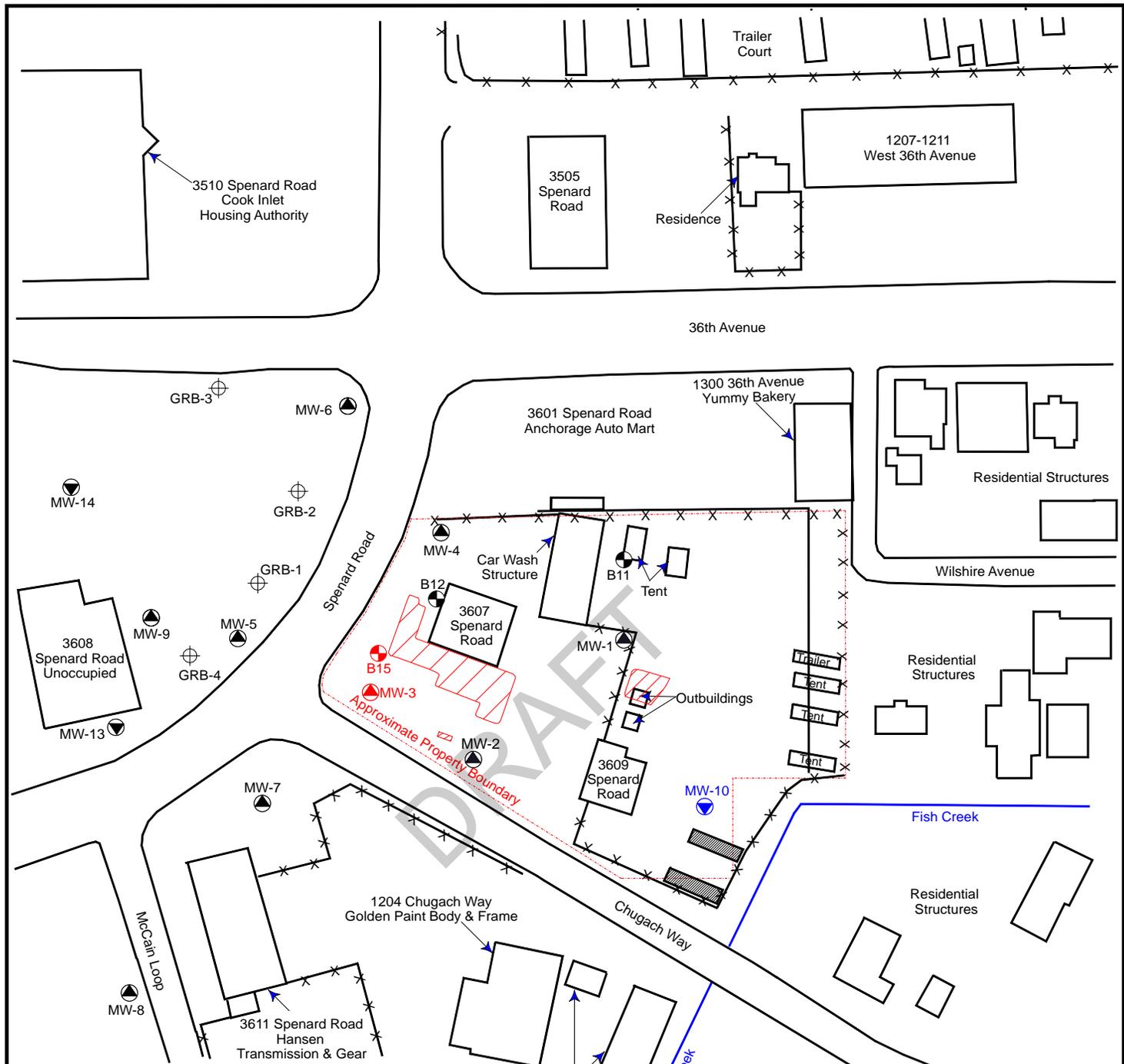


LEGEND

-  MW-14 Approximate location of Monitoring Well MW-10 installed by Shannon & Wilson in May 2013
-  B15 Approximate location of Boring B15 advanced by Shannon & Wilson in May 2013
-  SGP-1 Approximate location of nested Soil Gas Probe SGP-1
Note: Each point has one probe at 5 ft bgs, and 10 ft bgs.
-  GRB-1 Approximate location of soil boring GRB-1 advanced by BGES in January 2011
-  MW-1 Approximate location of groundwater Monitoring Well MW-1.
-  W Approximate location of drinking water well
-  Approximate location of connex storage container
-  -X-X- Approximate location of fence

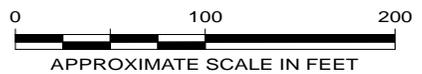


3607 & 3609 Spenard Road Anchorage, Alaska	
SOIL BORING AND MONITORING WELL LOCATIONS	
June 2013	32-2-17525-002
 SHANNON & WILSON, INC. Geotechnical & Environmental Consultants	
Fig. 3	

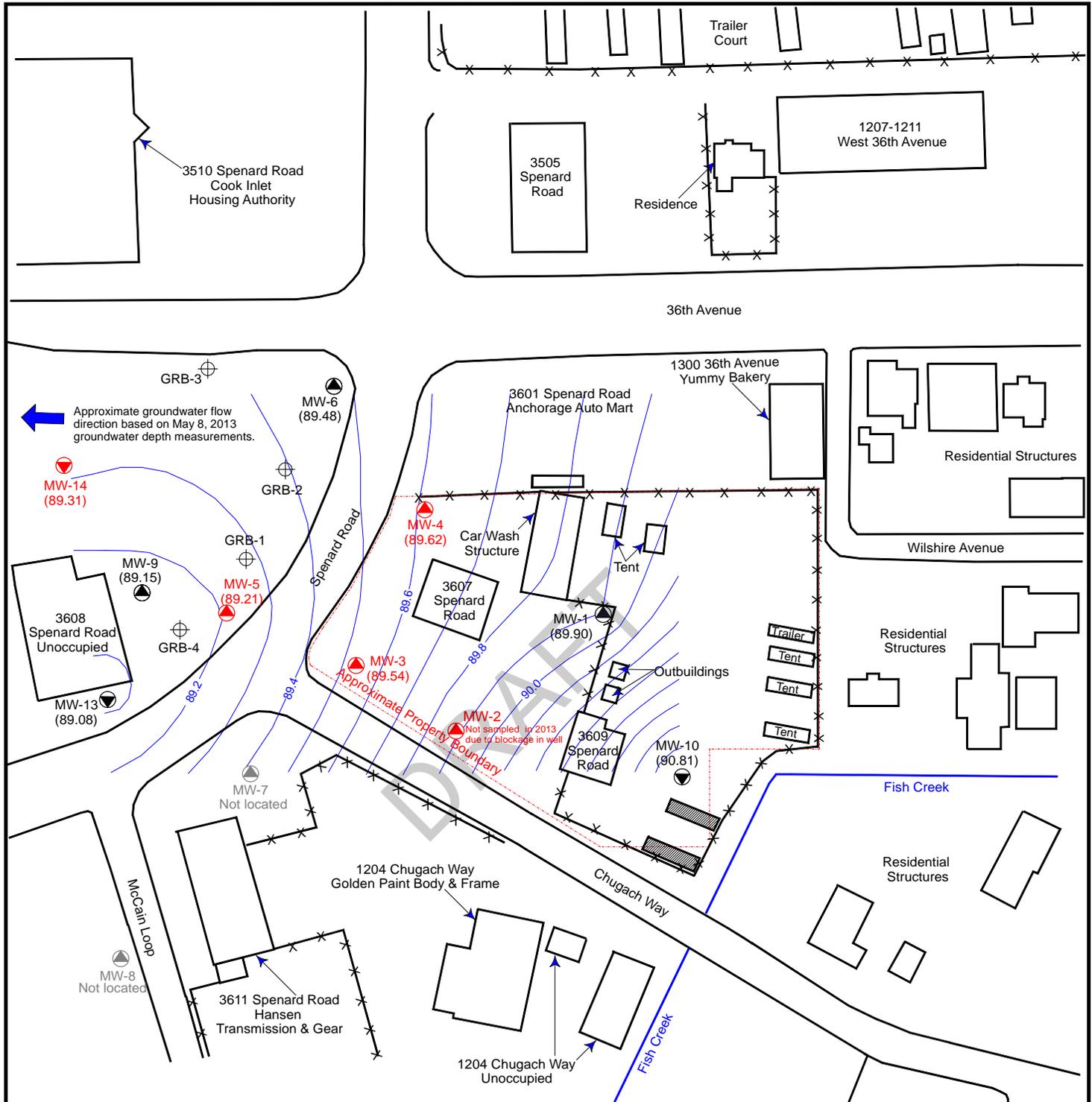


LEGEND

- MW-14 Approximate location of Boring/Monitoring Well MW-10 installed by Shannon & Wilson in May 2013
- B15 Approximate location of Boring B15 advanced by Shannon & Wilson in May 2013
- GRB-1 Approximate location of soil boring GRB-1 advanced by BGES in January 2011
- MW-1 Approximate location of Boring/Monitoring Well MW-1.
- Approximate extent of the 2001 excavations with documented soil contamination remaining at the base of the excavation
- Red** = Current or historical analytical soil sample with GRO, DRO, and/or benzene concentration(s) greater than the most stringent ADEC Method 2 cleanup levels
- Blue** = 2013 analytical soil sample with benzene concentration greater than the most stringent ADEC Method 2 cleanup levels; not associated with former UST/dispenser source area
- Black** = Current or historical analytical soil sample with GRO, DRO, and/or benzene concentrations not detected or less than the most stringent ADEC Method 2 cleanup levels
- Approximate location of connex storage container
- Approximate location of fence

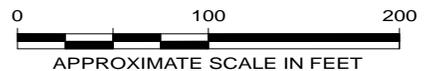


3607 & 3609 Spenard Road Anchorage, Alaska	
SITE PLAN SOIL DATA OVERVIEW	
June 2013	32-2-17525-002
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Fig. 4	



LEGEND

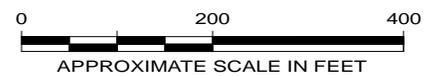
- MW-10
Approximate location of Boring/Monitoring Well MW-10 installed by Shannon & Wilson in May 2013
- MW-1
Approximate location of existing Monitoring Well MW-1.
- = Analytical groundwater sample with GRO, DRO, and/or benzene concentration greater than the ADEC Table C cleanup levels, based on May 2013 groundwater samples (or most recent if not tested in 2013)
- = Current analytical groundwater sample with GRO, DRO, and/or BTEX concentrations not detected or less ADEC Table C cleanup levels
- 89.2-
Estimated location of equipotential line of potentiometric surface with elevation of 89.2 feet based on May 8, 2013 depth-to-water measurements (relative to an arbitrary benchmark of 100 feet).
- Approximate location of connex storage container
- Approximate location of fence



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SITE PLAN MAY 2013 GROUNDWATER DATA	
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Fig. 5	



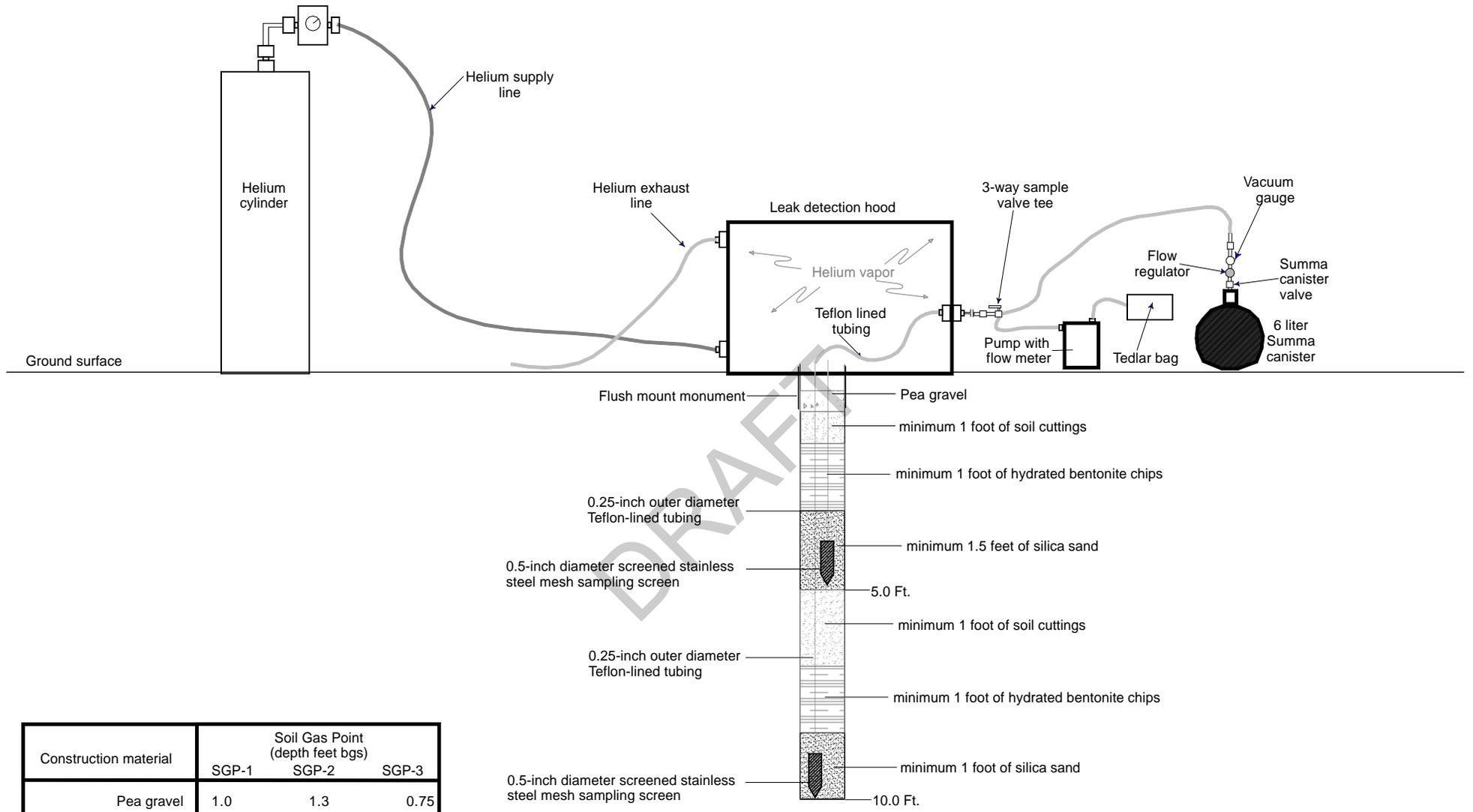
Map adapted from aerial imagery provided by Google Earth Pro, reproduced by permission granted by Google Earth (tm) Mapping Service



Note, drinking water samples were not collected from the 3801 and 3740 McCain Loop properties. Multiple attempts were made to contact the tenants, but our attempts were unsuccessful.



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DRINKING WATER WELL LOCATIONS	
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Construction material	Soil Gas Point (depth feet bgs)		
	SGP-1	SGP-2	SGP-3
Pea gravel	1.0	1.3	0.75
Soil cuttings	2.8	2.0	3.0
Hydrated bentonite chips	4.0	3.6	4.0
Silica sand	5.5	5.0	5.6
Soil cuttings	7.1	7.9	7.7
Hydrated bentonite chips	8.3	8.9	8.9
Silica sand	10	10	10

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**GENERAL SOIL GAS POINT
CONSTRUCTION AND SAMPLING DETAILS**

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Fig. 7

APPENDIX A
FIELD PHOTOGRAPHS

DRAFT



Photo 1: Looking west at the Discovery drill rig advancing Boring B10. (May 2, 2013)



Photo 2: Looking northeast at the Discovery drill rig advancing Boring B11. (May 2, 2013)

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PHOTOS 1 AND 2

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Photo 3: Looking north/northeast at the Discovery drill rig advancing Boring B12. (May 2, 2013)



Photo 4: Looking west at Well MW-13. (May 3, 2013)

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PHOTOS 3 AND 4

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A-2

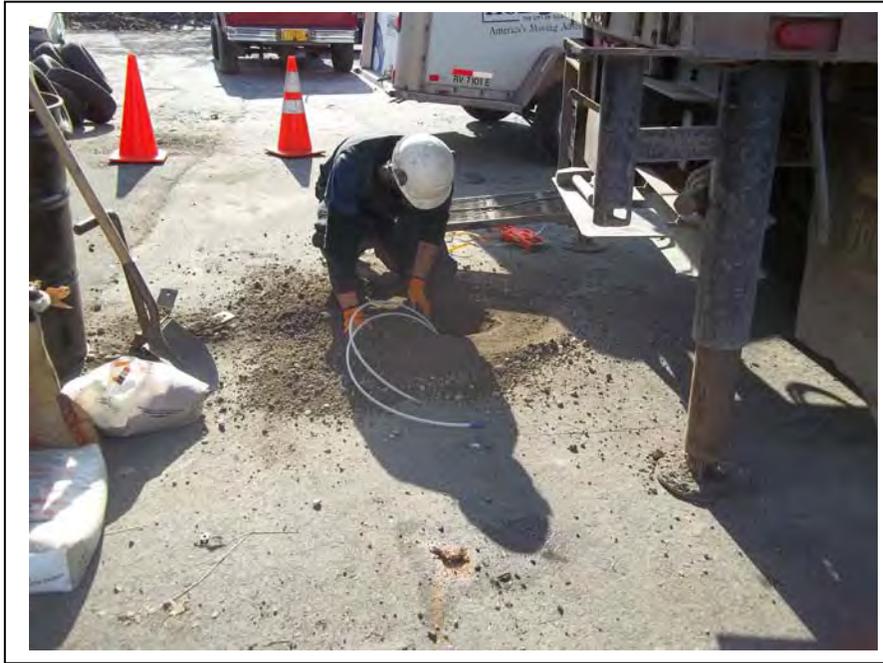


Photo 5: Looking east at Soil Gas Probe SGP1. (May 6, 2013)



Photo 6: Looking at the typical soil gas sampling equipment and set up at Soil Gas Point SGP-2. (May 16, 2013)

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PHOTOS 5 AND 6

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