Initial Subsurface Soil and Groundwater Characterization and Corrective Action Plan

Lot 10, Block 1, Metro Industrial Airpark
Fairbanks, Alaska

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Prepared For:

Glenn Goetz
2143 Van Horn Road
Fairbanks, AK 99701

Prepared By:

NORTECH

Environmental Engineering & Industrial Hygiene Consultants

Managing Office
2400 College Road
Fairbanks, Alaska 99709
p. 907.452.5688
f. 907.452.5694

206 E. Fireweed Lane, Suite 200
Anchorage, Alaska 99503
p. 907.222.2445
f. 907.222.0915

www.nortechengr.com

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APPENDICES

1.0 EXECUTIVE SUMMARY

NORTECH has completed an initial characterization of subsurface soil and groundwater at Alaska Truck and Gear. The facility is located at 2143 Van Horn Road and has a retail area and two maintenance shops. A Phase I ESA of the property identified several environmental concerns, including a total of six floor drains in the two shop buildings. These consist of 55-gallon drums poured into the concrete floor slabs when the two shop buildings were constructed in the late 1970s and are considered Class V injection wells. An additional concern was the presence of copper lines that appeared related to a heating oil tank that were no longer connected to a furnace.

Field screening, soil sampling, and groundwater sampling were undertaken to assess and initially characterize these environmental concerns. These activities have yielded sufficient data to identify the contaminants of concern at the site, develop a closure plan for the floor drains, develop a deed notice for contaminated soil remaining in place beneath the slab, develop a plan to complete the groundwater characterization, and outline a long term groundwater monitoring plan as part of the deed notice.

Excavation and field screening results near the copper fuel lines indicated that no tank was present and no evidence of contamination was observed. No additional investigation is recommended in this area. Based on the laboratory results, FD-01 in the north shop meets the ADEC cleanup levels for both soil and groundwater with the exception of total chromium in the groundwater. An additional groundwater sample from this location is recommended for Cr^{3+}/Cr^{6+} speciation to confirm that this is trivalent (Cr^{3+}) chromium, which has a significantly higher cleanup level than hexavalent (Cr^{6+}) chromium. After this sample is collected, this floor drain should be excavated and removed.

In the south shop, FD-02 meets the ADEC cleanup levels for both soil and groundwater and should be excavated and removed. Installation of a monument in the concrete slab is recommended for a potential future monitoring well in this location. FD-03, FD-04, FD-05, and FD-06 exceed the ADEC cleanup level for DRO in both soil and groundwater and FD-06 also exceeds the ADEC cleanup level for RRO in groundwater, but not soil. Laboratory results indicate GRO, VOCs, PAHs, and RCRA 8 metals are not considered contaminants of concern at this site. Approximately 120 to 140 cubic yards of DRO contaminated soil are estimated to remain beneath the south shop. Excavation and limited contaminated soil removal is recommended at these floor drain locations with additional field screening and limited laboratory soil sampling. The existing and additional soil data should be used to develop a deed notice for the property. Monuments should also be installed in these locations for potential future monitoring wells.

Groundwater delineation efforts should be expanded outside of the southern shop building utilizing direct push methods. Approximately eight additional groundwater samples are recommended in the vicinity of the southern shop building to complete this delineation. Laboratory analysis for DRO and RRO is appropriate based on the existing data and limited geochemical investigation using field-measured parameters is also recommended. An additional sample should be collect from the onsite water supply well. The additional groundwater results should be utilized in conjunction with the existing groundwater data to locate four to six monitoring wells for long term monitoring that will be outlined in the long term monitoring plan.

A long-term plan for groundwater monitoring that documents the groundwater contamination and outlines future sampling events should also be developed as part of the deed notice. The plan should be based on the data available at the site and is expected to include the objectives for monitoring and identify the points at which monitoring can be reduced or discontinued. The plan should include a discussion of contaminants of concern (DRO/RRO), which locations should be sampled (of the four to six permanent wells), the estimated number of sampling events (typically three to five), and a brief contingency plan if results are different than expected.

The EPA considered the floor drains at the site Class V injection wells and requires documentation of the wells and planned closure activities. Completed Class V injection well inventory and a pre-closure notification forms are both attached and should be submitted to EPA with a copy of this report. EPA has indicated that complete removal of the structure does not require a plugging and abandonment plan. EPA and ADEC have also indicated that ADEC will be the primary regulator of the site through the contaminated sites program. This report should be submitted to ADEC to document the site conditions and for approval of the corrective actions outlined in Section 8.

2.0 PROJECT BACKGROUND

This section provides a short summary of the Site characteristics and history. More detailed information about the Site, including ownership records and aerial photographs, are contained in the separate Phase I ESA report.

2.1 General Site Setting and Description

The subject property is identified as Lot 10, Block 1, Metro Industrial Airpark Subdivision. The site address is 2143 Van Horn Road and is located on the south side of Van Horn Road, just outside the Fairbanks city limits. The site is within the Fairbanks North Star Borough (see Figures 1 and 2). The Site currently has three buildings including two shop buildings utilized for truck maintenance and a retail building for parts and customer service activities. Community wastewater, electric, and communication utilities are currently available and connected to the Site. However, community water is not available on the south side of Van Horn Road and the site uses an on site well as a water source. Although the water is plumbed into each of the buildings, is not considered suitable for drinking and Alaska Truck Center provides bottled drinking water for employees.

The elevation of the property is approximately 445-445 feet above mean sea level with little observable topographic relief across the Site. A former slough is visible behind the Corporate Express facility to the west of the site. The water table throughout the Fairbanks lowlands is shallow and usually 10 to 20 feet below the surface, depending on ground elevations and groundwater stage, and water table fluctuations on the order of 2 to 5 feet occur seasonally. Groundwater under the Site is likely to be influenced by changes in water levels of the Tanana and Chena Rivers, as well as local snowmelt and precipitation. Depth to groundwater at the site is estimated to vary seasonally between 10 to 15 feet below the ground surface with a typical magnitude of 0.001 foot/foot or less. Nearby groundwater studies have indicated that the local groundwater flow direction is generally northwest with minor variations to the west. The Chena River to the north of the site generally acts as a drain for the local aquifer and the Tanana River to the south generally acts to recharge the aquifer. The nearest surface water body is Peger Lake located approximately 1000 feet to the north of the site which was created through gravel mining operations in this area.

Climate data for Fairbanks is established from the long-term weather observations taken at the Fairbanks International Airport (approximately 2.5 miles west at an elevation of approximately 440 feet). Over the 64-year station record for Fairbanks, the average air temperature has been 25.9 degrees Fahrenheit. The average annual precipitation in Fairbanks is 11.2 inches water equivalent. Average monthly temperatures are generally below freezing from October through April.

2.2 Project History and Previous Investigations

NORTECH conducted a Phase I Environmental Site Assessment (ESA) at the subject property in July 2006 for the current property owner prior to listing the facility for sale. The Phase I ESA identified several environmental concerns on the Site. The primary environmental concerns related to the finding of six floor drains/sumps in the two shops on the eastern side of Lot 10. A second environmental concern at the site identified was the apparent feed/return lines to a buried heating oil storage tank outside of the south shop. Other environmental concerns included the presence of a number of drums around the site and numerous small areas of stained surface soils associated with previously parked vehicles.

The floor drains/sumps appear to be 55-gallon drums that were installed during building construction. In the north shop, the concrete floor extends to the edge of the drum. Approximately 12-18 inches of silt and other material was shoveled from this drum and the bottom appeared to be intact, however a large amount of rust was present on the inside of the drum. The material shoveled from the drum had a fuel/solvent odor mixed with a septic odor from the anaerobic decay of materials in the drum.

Five floor drains were identified in the south shop. Each of these floor drains has a two to three foot square form around 55-gallon drum which appears to have been used to prevent the concrete from damaging the drum while the slab was poured. Several of the drums appeared to have cuts in the sides at regular intervals. Although some of these drums are reported to have intact bottoms, water and other liquids are likely to have entered the subsurface through the drums as well as the opening in the concrete slab around the drums.

Copper piping consistent with feed and return lines were identified running through the northern wall of the south shop and into the ground. Based on the lines and the current location of a furnace, these lines were assumed to be related to a former heating oil fuel tank. Photographs of the facility from the 1980s showed fill and vent pipes for a buried heating oil tank at this location.

NORTECH's Phase I ESA identified these floor drains as Class V injection wells and recommended that these floor drains should be assessed and closed in accordance with EPA and ADEC guidance. ***NORTECH*** also recommended limited investigation of the suspected former tank location to determine if a tank remained abandoned in place and/or if contamination existed at this location related to the previous tank.

2.2 Project Objectives and Scope of Work

The property owner requested the initial assessment and characterization of the site in an effort to assess and/or close the wells and move the property sale process forward. A limited Phase II ESA was conducted to characterize subsurface soil and groundwater conditions at the facility. The investigation included soil and groundwater sampling beneath each floor drain as well as field screening of excavated soils at the former underground storage tank location.

The objectives of the Phase II activities were to assess subsurface soil and groundwater and provide laboratory analytical data to determine the presence/absence of soil and groundwater contamination associated with the floor drains. The specific Phase II activities included:

- Headspace PID field screening of soil from an exploratory excavation at the location of a former underground storage tank
- Advancing soil borings through the bottom of each floor drain to a depth intercepting the groundwater table beneath the site
  - Headspace PID field screening of site soils from each soil boring
  - Laboratory soil sampling of the highest recorded field screening location from each soil boring
- Advancing temporary monitoring wells to the top of the water table and collecting laboratory samples of the shallow groundwater from the each floor drain location

3.0 METHODOLOGY

The field activities undertaken during this initial soil and groundwater characterization at the Site were intended to provide an initial data set for planning future activities at the Site. In the event that a particular floor drain appeared to be generally clean, data adequate to close the floor drain was collected. These activities were conducted in general accordance with ADEC guidance and this section briefly summarizes the major components of each field methodology.

3.1 Direct Push Techniques

The installation of soil borings, subsurface soil sampling, and groundwater sampling were conducted utilizing direct-push techniques. ***NORTECH*** subcontracted with GeoTek Alaska (GeoTek) from Anchorage, Alaska, to provide the direct-push equipment and operators for this project.

Soil borings were installed by hydraulically advancing a hollow drive casing through the bottom of each floor drain. Internal sample casing sections were five feet long and fitted internally with a Teflon sampling sleeve which collected a continuous core sample of the subsurface soil matrix in each five foot section. Continuous core soil samples were retrieved from each boring in five foot increments. The sample was extracted from the boring and inspected prior to separation into shorter intervals for field screening and laboratory analysis. Each soil boring was advanced until the water table was encountered. Drive and sampling equipment was retrieved from each boring and decontaminated.

After the water table has been reached, a screened stainless steel sampling rod was advanced adjacent to the established soil boring. The groundwater sampling rods were set at a depth such that the screen intersected the top of the water table. Upon completion of the sampling activities, the groundwater sampling points were retrieved from each boring and decontaminated.

3.2 Headspace Field Screening

A PhotoVac 2020 Hand Held Air Monitor/Photoionization Detector (PID) was used to field screen the soils for POL contamination. Field screening samples were collected every foot from the bottom of each floor drain, between 2.5 to 3 feet below the ground surface (bgs), to the final depth of each boring. ***NORTECH*** used the headspace method of field screening in general accordance with Section 4 of the ADEC *UST Procedures Manual and Standard Sampling Procedures* (the SSP). Headspace screening consists of partially (33%-50%) filling a clean resealable bag with freshly uncovered soils to be field screened. The resealable bag was closed and headspace vapors were allowed to develop for at least 10 minutes and not more than one hour. The bag was agitated at the beginning and end of the headspace development period. In accordance with the SSP, the highest PID reading from each sample was recorded.

3.3 Soil Sampling

A laboratory soil sample was collected from each soil boring location. Soil samples were collected into clean, laboratory-supplied jars, appropriately labeled, and placed immediately into a cooler with ice. The sample from each boring with the highest field screening result was submitted to the laboratory for some or all of the analyses described in Section 3.5 below.

3.4 Groundwater Sampling

One groundwater sample was collected from each of the six floor drain locations. Additionally, one duplicate groundwater sample was collected during this investigation. Each groundwater sampling point was purged of at least five well volumes (as estimated from the depth of water measured in the drive point) and sampled using a peristaltic pump and low-flow sampling techniques. Groundwater samples were collected into clean, laboratory-supplied jars, appropriately labeled, and placed immediately into a cooler with ice. The groundwater samples were submitted to the laboratory for some or all of the analyses described in Section 3.5 below.

3.5 Laboratory Analyses

Six soil samples and seven water samples were collected to characterize the potential for environmental concerns at the Site. The following list indicates the analytical methods used on each of the samples:

- Gasoline Range Organics (GRO) by Alaska Method AK 101
- Diesel Range Organics (DRO) by Alaska Method AK102
- Residual Range Organics (RRO) by Alaska Method AK102
- Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) by SW8021B

Additionally, selected soil and/or groundwater samples were further analyzed using the following analytical methods:

- Volatile Organic Compounds (VOCs) by Method SW8260B
- Polycyclic Aromatic Hydrocarbons (PAH) by Method 8270C SIMS
- RCRA 8 Metals (Ag, As, Ba, Cd, Cr, Hg, Pb, Se) by 6010/7421

Specific sample container and preservation requirements and QA/QC procedures are described in the SSP, along with more details regarding sample management. One field duplicate was collected for groundwater, but a soil sample duplicate was not collected due to insufficient quantities of soil collected in the small diameter Teflon sampling sleeves. Trip blanks were included for GRO, BTEX, and VOC analysis for both soil and groundwater.

3.6 Soil and Groundwater Cleanup Levels

The cleanup criteria for this Site were determined using ADEC's Method 2 for soil (under 40-inch zone, migration to groundwater) as outlined in ADEC regulations (18 AAC 75.341, Tables B1 and B2). Groundwater contaminant cleanup levels are listed in Table C of the same regulation. Method 2 cleanup levels are shown with the laboratory results for selected compounds in Tables 2 and 3 of Appendix 2.

The Fairbanks area is known to have naturally occurring metals which regularly leads to soil and groundwater metals concentrations in excess of the ADEC cleanup levels. The Army Corps of Engineers Alaska District published *Background Data Analysis for Arsenic, Barium, Cadmium, Chromium, & Lead on Forth Wainwright, Alaska* in 1994 to address these elevated background concentrations of these metals regularly observed in the Fairbanks area. While this data is specific to Fort Wainwright, ADEC routinely allows application of the background concentrations calculated in this document to be applied throughout Fairbanks. These values are also included for comparison in Table 2.

4.0 FIELD ACTIVITIES

The field activities for this investigation were performed on July 19, 27, and 28, 2006. Peter Beardsley and Ron Pratt of ***NORTECH***, and a two-person drill crew from GeoTek were present at the site during some or all the activities. Weather conditions during these field activities were generally dry and partly to mostly cloudy with high temperatures around 70^{o}F with calm to light winds. The exploratory UST excavation and soil boring locations are shown in Figure 4.

On July 19, 2006, ***NORTECH*** personnel visited the site to conduct an assessment of the former heating oil tank location. Hand excavation of the former tank location identified the bottom of the copper lines approximately three feet below the ground surface. Additional excavation to approximately 4.5 feet below the ground surface indicated that no tank was present within the normal installation depth of buried heating oil tanks in Fairbanks. Soil removed during this excavation was field screened using the PID. Approximately 10 field screening samples were all in the expected background range (<5 ppm). Since no evidence of contamination was encountered during this investigation the excavation was backfilled. The location of this excavation activity is shown on Figure 4.

On July 27 and 28, ***NORTECH*** personnel were onsite with the GeoTek crew to conduct subsurface soil and groundwater sampling. One soil boring was completed at each of the six identified floor drain locations and headspace field screening results are summarized in Table 1. A shallow boring was advanced approximately five feet in FD-06 between the drum and the edge of the concrete. One laboratory soil sample was collected from each boring, except the second boring in FD-06, based on the field screening results. After completion of each soil boring, groundwater sampling was undertaken. Extremely low recharge of the groundwater was observed in FD-03 through FD-06 in the south shop.

5.0 LABORATORY RESULTS

Most of the laboratory results from each of the soil and groundwater samples are summarized in Tables 2 and 3, respectively. Metals concentrations for both matrices are summarized in Table 4. Since many potential contaminants of concern were not detected in most of the laboratory samples, these tables are limited to compounds that were detected in one or more sample or are a particular concern due to known or suspected contamination in the area or the current or potential future use of the Site. Complete copies of the laboratory reports are included in Appendix 4. A copy of the ADEC Laboratory Data Review Checklist is also included in Appendix 4.

5.1 Soil Results

One floor drain (FD-01) is located in the north shop and detectable concentrations of DRO (39.8 mg/kg) and RRO (126 mg/kg) were observed in the soil sample from this location. Two refrigeration compounds, dichlorodiflurormethane (0.0184 mg/kg) and trichlorofluoromethane (0.0695 mg/kg), were also detected in this sample. Five metals were also detected: arsenic (5.34 mg/kg), barium (80.9 mg/kg), cadmium (0.311 mg/kg), chromium (15.7 mg/kg), and lead (3.72 mg/kg). Other compounds from these analytical methods were below the laboratory practical quantitiation limit.

Five floor drains are located in the south shop and a total of five soil samples were collected during this investigation to characterize the contaminant concentrations in the soil beneath these floor drains. Each of these soil samples was analyzed for POL contaminants include GRO, DRO, RRO, and BTEX. The analysis results show that the soil beneath the southern shop building has detectable concentrations of one or more of these analytes. GRO concentrations ranged from not detected at 1.92 mg/kg to 58 mg/kg, DRO concentrations ranged from not detected at 21 mg/kg to 4,160 mg/kg, and RRO ranged from 67 mg/kg to 10,700 mg/kg. Toluene, ethylbenzene, and xylenes were detected in two or more of the samples with a maximum concentration of 1.28 mg/kg.

The sample with the highest field screening value (FD-05) was also analyzed for VOCs, PAHs, and metals. Ten VOC compounds and five PAH compounds were detected at concentrations below 1.0 mg/kg. Five metals were also detected: arsenic (3.0 mg/kg), barium (51.3 mg/kg), chromium (11.6 mg/kg), and lead (2.28 mg/kg), and selenium (0.698 mg/kg).

5.2 Groundwater Results

The groundwater sample from FD-01in the north shop had detectable concentrations of two VOCs: cis-1,2-dichloroethene (0.00104 mg/l) and 1,2,4-trimethylbenzene (0.00153 mg/l). Five metals were also detected in this sample: arsenic (0.0628 mg/l), barium (0.923 mg/l), total chromium (0.142 mg/l), lead (0.0543 mg/l), and selenium (0.0101 mg/l). No other VOCs, PAHs, or petroleum contaminants were detected above the laboratory practical quantititation limit.

A total of six groundwater samples (including one duplicate) were collected to characterize the groundwater beneath the floor drains in the south shop. POL and VOC analyses were run on each of the six samples (except for VOCs on the field duplicate) and the results show that the groundwater beneath the southern shop building has detectable concentrations of some POL and VOC compounds. DRO was detected in five of the six samples with concentrations ranging from 3.78 mg/l to 15.1 mg/l. RRO was detected in four of the six samples an concentrations ranged from 0.692 mg/l to 1.3 mg/l. Benzene was detected in three of the samples with concentrations ranging from 0.00104 mg/l to 0.00154 mg/l. GRO and 15 other VOCs were detected in one or two samples with a maximum concentration of 0.04 mg/l and most concentrations were at least an order of magnitude below this level.

PAH and metals analyses were performed on three of the six samples (FD-02, FD-04, and FD-06) based on expected contaminant concentrations and hydraulic gradient geometry. None of the PAH compounds were detected in these three samples. Arsenic was detected in each of the three samples with a range of 0.0131 mg/l to 0.0493 mg/l. Barium was also detected in each of the three samples between 0.273 mg/l and 0.501 mg/l. Chromium and lead were detected in two samples at or below 0.0223 mg/l and 0.00757 mg/l respectively. Selenium was detected in one sample at 0.0128 mg/l. Cadmium, mercury, and silver were not detected in these three samples.

5.3 Quality Control Summary

The field sampling effort was intended to provide an initial characterization of the soil and groundwater beneath the site. The field methods were consistent with ADEC guidelines and the sample integrity is of adequate quality. However, due to the extensive number of analysis and the limited volume of soil available in the sampling sleeve, an insufficient amount of soil was available for creating a duplicate sample from any of the soil boring locations. As a result, no soil field duplicate was collected during this investigation to identify potential sample collection, handling, or analysis deficiencies.

One groundwater sample duplicate (duplicate of sample FD-06-W) was collected as part of this investigation to identify potential sample collection, handling, or analysis deficiencies. The duplicate sample was analyzed for GRO, DRO, RRO, and BTEX contaminants only. A comparison of the analysis results is presented in Table 5; Quality Control Summary.

The SGS laboratory report for both the soils and the groundwater analysis contains a case narrative describing a variety of potential quality control issues encountered at the laboratory along with a description of the potential effect on the results. This case narrative is located on pages 2 through 6 of the laboratory report in Appendix 4.

NORTECH reviewed these potential quality issues as well as the other quality related portions of the laboratory report for issues that are considered significant to the overall quality of the laboratory data.

Barium was detected in the control blank for some of the soil samples, however, the sample concentration in these samples was more than ten times the concentration in the control blank and the results are considered valid. Some surrogates were above the allowable limits due to hydrocarbon interference from the contaminants in the soil samples, which is not considered a significant concern. Additionally, the GRO/BTEX analysis for three soil samples was performed after the hourly hold time, but were performed on the 14th day after collection and this is not considered a significant concern. Water samples had high LCS surrogate recovery and the AK102/103 was extracted between 7 and 14 days, neither of which is considered a concern.

The other comments are related to surrogate recoveries and/or spike or control samples performed as part of the internal laboratory quality control requirements. These have the effect of biasing certain results high or low by a small percentage. The actual sample concentrations of these compounds was either non-detect or well above the range that would indicate these quality control issues would have a significant effect on the results.

Based on review of the field and laboratory quality control review, all of the data may be used for the objectives of the evaluation.

5.4 Conceptual Site Model

The conceptual site model (CSM) is a method used to systematically evaluate the potential receptors that may exist at a site now or at any time in the future. ADEC now requires that all site characterization work plans contain at least a preliminary CSM. The goal of the CSM is to outline all scenarios that theoretically could lead to an adverse impact on human and/or environment receptors that are present on and off the site. The CSM was completed per the ADEC draft guidelines for CSMs. A copy of the draft ADEC CSM questionnaire is included in Appendix 5 as a preliminary CSM for the site. A graphical representation of the CSM is also included in Appendix 5 and a cross-section of the site showing potential concerns is presented in Figure 5.

The facility is currently used as shops, warehouse space, and retail space by Alaska Truck and Gear. While the facility may be sold in the near future, facility use in the future is expected to be similar as the buildings are designed for this use and have been used in a generally similar manner since construction in the late 1970s. Current data indicates that soil contamination remains in place below the slab of the south shop and that the groundwater smear zone is also contaminated below the shop.

Groundwater contamination is expected to extend outside the shop footprint to the northwest, but has not been confirmed at this time. DRO is the only contaminant of concern that has been identified as exceeding ADEC cleanup levels in soil. While DRO is the primary contaminants of concern in groundwater, RRO also exceeded the cleanup level in one sample. Several BTEX, VOC, RCRA metals, and PAH indicator compounds were detected at levels below ADEC Method 2 cleanup levels or background levels in both soil and groundwater. The actual likelihood of impacts to these receptors is discussed in Section 6.0.

The existing building has concrete perimeter footings with a concrete slab on grade. Soil excavation during removal of the floor drain structures is expected to result in removal of 8 to 10 cubic yards of contaminated soil, including most contaminated soil within two feet of the bottom of the concrete slab. Subsurface contamination will remain in place due to structural concerns. The quantity of contaminated subsurface soil that will remain in place has been estimated based on the floor drain configuration. Groundwater smear zone contamination and groundwater contamination also exist. The top of the groundwater smear zone is somewhat variable and difficult to delineate due to annual changes in groundwater elevation in the area. Potential exposure pathways of the soil and groundwater contaminants include:

- Incidental soil ingestion
- Ingestion of groundwater
- Inhalation of outdoor air
- Inhalation of indoor air
- Exposure of groundwater during a future excavation
- Exposure of the soil during a future excavation

Potential receptors that could be affected at the site are commercial/industrial workers (facility employees), site visitors (although clients are generally not allowed in the shop spaces), construction workers (particularly those associated with future assessment efforts), and trespassers.

Surface soils are defined as soils within two feet of the surface. The surface soils of the site are expected to be clean after the excavation and will be sealed beneath the concrete slab. However subsurface soils are expected to remain contaminated and the ADEC guidance indicates that the incidental soil ingestion pathway includes soils up to 15 feet below the ground surface. This pathway is potentially complete for all receptor categories.

Volatilization from the contaminated subsurface soil and groundwater may be possible to the surface or into the building through or adjacent to the concrete slab. The volatilization pathway into the atmosphere may provide an exposure route above the remaining contamination. Volatilization from the soil into or groundwater near the building provides a potential pathway for inhalation exposure route to workers and visitors to the Site.

Excavation of the contaminated soil in the vadose zone and groundwater smear zone would provide exposure routes through ingestion, inhalation, and direct contact to construction workers involved with the excavation. Excavation for a remediation project would also impact the groundwater and provide exposure through the same pathways.

The hydraulic gradient at this facility and at other known contaminated sites in the area is generally northwest. The groundwater contamination is expected to extend outside the footprint of the building, but is not currently anticipated to extend offsite. Future development plans for the site will need to take the groundwater contamination into account once the additional delineation activities have identified the extent of the contamination.

NORTECH reviewed the Draft Ecological Scoping Evaluation Guidance issued by ADEC in September 2005. No direct impacts or acute toxicity impacts were observed at the site as described in Scoping Factor 1. The receptor-pathway interactions (Scoping Factor 2) described in the guidance are not considered complete because the site landscaping is not expected to reach the contaminants and contaminant migration to accessible locations is unlikely. Additionally, the concentrations of the petroleum indicator compounds in Table 1 are below cleanup levels. Based on these factors, an ecological conceptual site model is considered unnecessary for the site.

6.0 ANALYSIS

NORTECH has completed an initial characterization of subsurface soil and groundwater at 2143 Van Horn Road, in Fairbanks, Alaska. The facility is currently owned by Glenn Goetz and is operating as Alaska Truck and Gear with two maintenance shops and a retail area. A Phase I ESA of the property identified several environmental concerns. A total of six floor drains, consisting of 55-gallon drums poured into the concrete floor slabs, were installed when the two shop buildings were constructed in the late 1970s. An additional concern was the presence of copper lines that appeared related to a heating oil tank that were no longer connected to a furnace. This report documents the activities that have been conducted at the site to address these concerns and makes recommendations for additional assessment, corrective action, and long term monitoring at the facility.

6.1 Former Heating Oil Tank

The two copper lines exiting the building near a current furnace location and historic photographs indicated the potential for an abandoned heating oil tank near the north side of the south shop. A hand excavation in this area indicated that the copper lines extended approximately three feet below grade and were crimped off. The excavation was extended another 1.5 feet below the grade and a tank was not observed. Visual inspection and headspace field screening showed no evidence of contamination and no samples were collected. Based on these field results, no additional investigation is considered necessary to address this potential environmental concern.

6.2 Floor Drain Removal and Closure

The floor drains need to be removed to prevent additional contamination from future activities in these shops. Based on discussions with the EPA Underground Injection Control (UIC) personnel, the floor drains should be inventoried using EPA's Class V Injection Well Inventory form and a pre-closure form should be completed. Due to the concrete slab/drum configuration, complete removal of the drum is the preferred closure method. In the event that the drums are removed and the excavations are backfilled and sealed with concrete, EPA does not require submission of a Plugging and Abandonment Plan. As most water on the shop floor comes from melting snow and ice on vehicles during winter months, removal of these floor drains is recommended this fall.

As discussed in more detail below, most contamination associated with these drums is expected to be within one foot of the sides and bottom of these drums. Removal of the drum along with 6 to 12 inches of concrete and subsurface material on each side, including the bottom of the drum, is recommended to remove the maximum quantity of secondary source soils. This should be done to the extent practical without impacting the structural integrity of the slab and is expected to occur primarily with hand tools. Gravel backfill is recommended with adequate compaction to support the new slab and the new concrete should be sealed with the existing slab using standard industry materials.

Due to the limited remaining soil contamination and need for long term groundwater sampling points at the site, groundwater wells will be installed in selected floor drain locations after the area has been backfilled. Standard direct-push monitoring well installation techniques will be utilized and each well will have a seal and a steel bolt-down monument to prevent future damage and contaminant infiltration from the surface. At this time, installation of the monuments is recommended with installation of monitoring wells at a later date based on the results of the additional groundwater delineation. Unused monuments will be grouted to prevent future infiltration.

6.3 North Shop – FD-01

One floor drain is present in the north shop and consists of a 55-gallon drum in the slab with concrete up to the edge of the drum. Research during the Phase I ESA indicated that this building was originally operated as a refrigerated warehouse until the last few years. The floor drain is located in the northwest corner of the warehouse and was underneath elevated wooden decking during the refrigerated warehouse operation. A few cubic feet of moist sludge was removed from this drum during the Phase I inspection and the drum appeared to be intact, although rusting significantly. The sludge that was removed had a septic odor associated with anaerobic decay and was collected for future disposal.

Field screening of the soil between the bottom of the drum and the water table indicated that the only depth with elevated headspace readings was the one-foot interval immediately below the drum. The soil sample was collected from this depth and laboratory analysis indicated the sample met the ADEC Method 2 cleanup levels for petroleum fractions, VOCs, PAHs, and RCRA 8 metals, with the exception of arsenic. Arsenic is common in the Fairbanks vicinity and the concentration in this sample is below the background concentration calculated for Fort Wainwright on the south side of the Chena River.

The groundwater sample collected directly beneath FD-01 met the ADEC standards for petroleum fractions, VOCs, and PAHs. Five metals were detected and three metals (arsenic, chromium, and lead, exceeded the ADEC standards. While the arsenic and lead concentrations exceed the ADEC standard, they are both below the recommended background concentration calculated for Fort Wainwright. The chromium concentration (0.142 mg/l) exceeds the recommended background concentration (0.125 mg/l) by approximately 13%.

The laboratory confirmed this chromium concentration and was unable to speciate the chromium into trivalent (Cr^{3+}) and hexavalent (Cr^{6+}) due to hold time concerns. Cr^{3+} is the naturally occurring valence of chromium and has a high cleanup level while Cr^{6+} is a result of certain heavy industries and is quite toxic and has a much lower cleanup level. The total chromium cleanup level in the ADEC regulations is based on the Cr^{6+} valance. Collection of a new water sample at this location is recommended to confirm that this chromium is actually background Cr^{3+} and no other analyses are considered necessary based on previous results. Since these results are expected to meet ADEC cleanup levels, this floor drain is anticipated to be removed and sealed upon receipt of the results. No other characterization, additional soil sampling, or monitoring well installation is expected to be necessary during closure of this floor drain.

6.4 South Shop

6.4.1 North End (FD-02)

This floor drain is located on the western side at the north end of this shop and is generally outside the active maintenance area in the shop. Field screening results from the bottom of the drum to the water table were all within the expected background range (0.5 to 2.3 ppm). A laboratory soil sample was collected at the highest headspace location, approximately two feet below the bottom of the drum. Due to the low field screening levels, the soil sample was expected to be clean and laboratory analysis was limited to petroleum fractions and BTEX. The sample meets the ADEC cleanup criteria for these compounds.

The groundwater sample collected at this location was analyzed for petroleum fractions, VOCs, PAHs, and RCRA 8 metals. This was undertaken to allow full closure of the well and delineation of the groundwater plume, if necessary. Petroleum fractions and PAHs were not detected in the sample and only two VOCs were detected at concentrations at least two orders of magnitude below the ADEC standard. Two metals, arsenic and barium, were also detected below the cleanup standard.

These results indicate that the floor drain should be removed as described above. No additional field screening or soil sampling is considered necessary at this location. A permanent monitoring well may be appropriate at this location for delineation of the northern edge of the plume within the building.

6.4.2 South End (FD-03, FD-04, FD-05, and FD-06)

These four floor drains are in the southern part of the south shop in the primary truck maintenance area. This shop area has been used for truck maintenance since the shop was built and this area also includes bulk storage of vehicle fluids. Floor drains FD-03 and FD-05 are in the middle of the shop and are considered the most likely route for liquids on the shop floor into the subsurface. FD-04 is located on the western edge of the shop in an area where tools are stored and smaller parts are cleaned and worked on. FD-06 is in the southeast corner of the shop, near a set of bulk liquid containers.

Floor Drain Structures and Soil
FD-03 had elevated field screening values in the one foot interval immediately below the drum bottom (four feet below the slab) and field screening results generally attenuated to background below that depth. FD-04 field screening values were elevated from the bottom of the drum to approximately eight feet below the slab (five feet below the drum). The highest field screening value in FD-04 was in the five to six foot interval below the slab. Elevated field screening values were observed from the

drum bottom (2.5 feet below the slab) to approximately 10 feet below the slab (seven feet below the drum). The highest field screening value was measured at approximately seven feet below the slab. Elevated field screening results were founding FD-06 to approximately two feet below the bottom of the drum. A short soil sample next to the drum also found elevated readings at the surface and in the two feet below the bottom of the drum.

Based on these field screening results, ***NORTECH*** collected soil samples at three feet (the bottom of the drum) in FD-03, five feet in FD-04, 6.5 feet in FD-05, and 2.5 feet (the bottom of the drum) in FD-06. FD-05 had the highest overall field screening values and this sample was analyzed for the full suite of potential contaminants of concern. Laboratory analyses of the soil samples from the other three floor drains in this area were limited to petroleum fractions and BTEX based on the similarities of the suspected contamination.

The laboratory results confirmed DRO contamination exists above the ADEC Method 2 cleanup level in the subsurface soil at these four floor drain locations. The highest concentration (4,160 mg/kg) was observed in FD-06 and the lowest concentration (438 mg/kg) was observed in FD-05. GRO and BTEX results in each of the four samples were below the ADEC Method 2 cleanup levels by one to three orders of magnitude. RRO was also below the ADEC cleanup level. Several VOC and PAH compounds were detected in the soil sample from FD-05 and each was at least two orders of magnitude below the ADEC Method 2 cleanup level. Five metals were detected in the sample from FD-05. Barium, chromium, lead, and selenium concentrations were below the ADEC cleanup levels and arsenic exceeded the cleanup level, but was below the Fairbanks background concentration.

Based on these results, DRO is the primary contaminant of concern in the soil at the facility and future soil sampling efforts should be limited to DRO. Field screening results generally indicate that contamination extends up to ten feet below the slab, although the DRO concentrations have a poor correlation with the PID results. In some areas and excavation through a concrete slab to this depth would require removal of a significant portion of the slab to allow for a safe working environment. In addition to the worker safety issues, this type of excavation would also endanger the structural integrity of the building and is not recommended. Additionally, once the floor drains are removed and the floor is resealed, the remaining contaminated soils will be effectively capped and the potential for contaminant migration through the subsurface will be significantly reduced.

These factors indicate that a limited corrective action consisting of removal of the drums and soils within one to two feet of the drums (each side within the enlarged floor penetration and the bottom) is appropriate for this site. After removal of the drums and soil, additional field screening of the limits of excavation is appropriate. In the event that the previous sample location is excavated (FD-03 and FD-06) or field screening results at these limits are higher than those observed in the soil boring, additional sampling is recommended at the highest field screening location. Laboratory analysis for any future soil samples should be limited to DRO. Excavated soils will be considered contaminated and collected for remediation based on the current results. Thermal remediation at OIT is currently planned and ADEC will be notified if another remediation option is selected.

This proposed corrective action will not completely remove the soil contamination or fully delineate the extent of contamination beneath the building slab. Figure 5 provides a conceptual cross section of the line shown in Figure 4. This conceptual model has a 1:1 slope for contaminant migration in the subsurface soil and was utilized to estimate quantities of contaminated soil remaining beneath the slab. Based on this model, approximately 30 to 35 cubic yards of contaminated soil may remain in place beneath each of the four floor drains for a total of 120 to 140 cubic yards of contaminated soil remaining beneath the south shop. The new field screening results will be used in conjunction with the existing results to refine the estimated quantity of contaminated soil remaining in the vicinity of each floor drain.

Appendix 6 includes the EPA paperwork that is necessary to close the floor drains as Class V injection wells. These forms include a completed Class V injection well inventory form and a pre-closure notification form. These should be submitted to EPA along with this report to document the conditions at the site. EPA indicated that a Plugging and Abandonment Plan is not necessary due to the complete removal of the drums and sealing of the concrete slab. EPA also indicated that ADEC will be the primary regulatory agency for this site and current and future owner will not need to work with EPA to complete the site cleanup.

<u>Groundwater</u>

Laboratory results for water samples from these four locations generally confirm the contaminants of concern. DRO concentrations exceeded the ADEC cleanup level in each of the four locations, with concentrations ranging from 3.78 to 15.1 mg/l. RRO concentrations also exceed the ADEC cleanup levels in FD-06, the location with the highest RRO concentration in the soil. GRO, BTEX, and other VOCS were detected below the ADEC Method 2 cleanup levels, if present in the sample. Two samples (FD-04 and FD-06 were checked for metals and PAHs and no PAHs were detected and detected metals were below the ADEC cleanup levels.

Based on these results, DRO and RRO are the primary contaminants of concern in the groundwater at the site. Since each of these locations exceeds the ADEC cleanup levels for DRO, installation of a flush mount monument to allow future installation of a monitoring well is recommended during corrective actions. The actual need for a monitoring well in each location will be evaluated based on the results of groundwater DRO delineation outside the building.

The initial characterization was undertaken to identify the contaminants of concern and additional characterization is needed to delineate the groundwater contamination. The same direct push sampling methodology that was utilized for the initial characterization is recommended for the additional characterization activities. The sample from FD-02 indicates a clean area north of the contamination and one additional groundwater sample is recommended on both the east and south sides of the building to identify potential off-site contamination migrating onto the site. Since the groundwater flow in the area is expected to be west-northwest, six to eight additional samples are recommended west of the building to delineate the plume. The general locations of these are shown in Figure 4 and a conceptual cross section of the groundwater contamination and proposed well locations is shown in Figure 5. The groundwater samples from these locations should be analyzed for DRO/RRO. In addition, field analysis of several geochemical parameters, including dissolved oxygen (DO), pH, and oxidation/reduction potential (ORP).

The water supply well is also located northwest of the south shop. No petroleum odors or other evidence of contamination has been reported in this well at this time. Due to the location of this well and the potential exposure associated with the water use in the buildings, investigation of this well is also recommended. Investigation should include searching for a well log, confirming the total depth of the well, measuring the depth to water, and collecting a water sample from the water system for DRO/RRO analysis.

The results of the groundwater delineation around the building will be combined with the initial characterization results to identify the appropriate locations for long term monitoring wells at the facility. These will be used to confirm that the groundwater contamination at the site is stable or decreasing after the corrective actions have been implemented. At this time, four to six wells are anticipated to be installed for the long term monitoring program. The long term monitoring program is expected to be limited to DRO/RRO analysis and the sampling frequency will be outlined once the results of the characterization are available. At this time, three to five sampling events are anticipated to provide sufficient data to document the groundwater conditions for the long term monitoring program.

6.5 Conceptual Site Model

The conceptual site model indicates that inhalation is the primary long-term pathway for potential exposure to the petroleum contamination in the soil and groundwater. In the current facility configuration, potential exposure is limited to facility employees, visitors, and trespassers since no residential facilities exist at the facility. Remaining soil contamination is below the inhalation cleanup levels for outdoor exposure and is contained beneath the concrete floor of the shop building. Additionally, the potential for inhalation through vapor intrusion exists, although the measured soil and groundwater concentrations for specific vapor intrusion contaminants of concern are below the vapor intrusion thresholds calculated for similar sites in the Fairbanks area. Removal of the floor drain structures and patching and sealing of the concrete slab are also expected to reduce the potential for vapor intrusion in the buildings. Due to the historic and ongoing truck maintenance activities at the facility, indoor air quality testing to evaluate vapor intrusion is not expected to be effective or considered necessary.

The other primary methods of exposure are through direct contact with contaminated soil and ingestion of contaminated groundwater. Once the proposed corrective action is complete, contaminated soil remaining at the site is expected to be more than 2 feet below the repaired slab. Direct contact with this soil is considered unlikely except during future site excavation. Groundwater ingestion may also be possible due to the onsite well, but this well is not used as drinking water at the facility and the well will be tested for DRO contamination during the planned groundwater delineation activities.

Future excavation into contaminated soil and groundwater onsite will also expose persons through inhalation, ingestion, and direct contact. On-site soil and groundwater contamination will be fairly well-defined after the proposed activities and future excavation is not expected unless the building is demolished. Foundation construction in this area is generally perimeter footing with a slab on grade. Due to the gravel pad constructed for the current building foundations, large-scale excavation for a foundation during future development is considered unlikely.

7.0 CONCLUSIONS

NORTECH has completed an initial characterization of subsurface soil and groundwater at Alaska Truck and Gear. The facility is located at 2143 Van Horn Road and has two maintenance shops and a retail area. A Phase I ESA of the property identified several environmental concerns, including a total of six floor drains in the two shop buildings. These consist of 55-gallon drums poured into the concrete floor slabs when the two shop buildings were constructed in the late 1970s and are considered Class V injection wells. An additional concern was the presence of copper lines that appeared related to a heating oil tank that were no longer connected to a furnace. Field screening, soil sampling, and groundwater sampling were undertaken to assess and initially characterize these environmental concerns. Based on the results of these activities, ***NORTECH*** has developed the following conclusions about the Site:

- No tank or elevated field screening results were observed near the copper fuel lines
- FD-01 in the north shop meets the ADEC cleanup levels (based on Fairbanks background concentrations) for both soil and groundwater, except for total chromium in groundwater
- FD-02 in the south shop meets the ADEC cleanup levels for both soil and groundwater
- FD-03, FD-04, FD-05, and FD-06 exceed the ADEC cleanup level for DRO in both soil and groundwater
- FD-06 exceeds the ADEC cleanup level for RRO in groundwater
- GRO, VOCs (including BTEX), and PAHs, were not detected above ADEC cleanup levels and are not considered contaminants of concern at the site
- RCRA 8 metals were not detected above Fairbanks background concentrations (arsenic and lead) or ADEC cleanup levels (others) and are not considered contaminants of concern at the site
- 120 to 140 cubic yards of contaminated soil are estimated to remain within the structural prism of the south shop
- EPA requires submission of a Class V injection well inventory form and a pre-closure notification form, both of which are attached
- ADEC will be the primary regulator of the site

8.0 RECOMMENDED CORRECTIVE ACTION PLAN

The initial subsurface soil and groundwater characterization investigation has provided sufficient data to document POL impacts to the subsurface soil and groundwater environments beneath the two shop buildings at the site. These results have been used to develop the following corrective actions to remove and close the floor drains, complete the groundwater delineation, and develop a long term monitoring plan for the property. The following activities are recommended as a corrective action plan for the site:

- Documentation Efforts
  - Submit this report to ADEC to document the site conditions and for approval as a corrective action plan for the activities recommended below
  - Submit this report to EPA to inventory the Class V injection wells, document the site conditions associated with these wells, and provide notification of the well closure timeframe and methodology

- Collect a groundwater sample from FD-01 for chromium speciation to verify hexavalent chromium (Cr^{6+}) is not a contaminant of concern
- Decommission and close the six existing floor drains/sumps
  - Excavation and removal of the drums comprising the floor drains/sumps.
  - Removal of 6 to 12 inches of concrete slab to facilitate soil removal and sealing of new concrete
  - Excavation of accessible contaminated soil material to the limits of the concrete cutting and up to 2 feet below the bottom of the drum
  - Conduct soil headspace field screening of the new limits of excavation
  - Collect one soil sample from each floor drain excavation for laboratory analysis if
    - the previous sampling location was removed during excavation or
    - field screening results at the limits of excavation are higher than the highest readings during the initial characterization
  - Submit soil samples for DRO analysis
  - Backfill and compaction of the excavations with clean imported fill material as appropriate to maintain the structural integrity of the floor slab

- Install monuments for potential future monitoring wells in the former floor drain locations in the south shop
- Utilize these results to confirm the estimated quantity of contaminated soil remaining at each location
- Develop a deed notice to document the contamination that remains beneath the building slab

• Groundwater delineation outside of the southern shop building
  - Utilize direct push methods to collect approximately eight additional groundwater samples in the vicinity of the southern shop building as shown in Figure 4
  - Measure DO, pH, ORP, and other field parameters to evaluate the geochemistry of the edges of the plume
  - Collect a sample from the onsite water supply well
  - Submit groundwater samples for DRO and RRO analyses
  - Utilize the new results in conjunction with the existing groundwater results to locate four to six monitoring wells for the long term monitoring program

• Develop a long-term plan for groundwater monitoring at the site that documents the issues below. The currently anticipated outline of the plan is shown in parentheses.
  - Contaminants of concern (DRO/RRO) and field parameters
  - Locations to be samples (four to six new wells)
  - Number of sampling events (three to five)
  - Contingency plan (resample to confirm results)
  - Reference or attach this plan to the deed notice for the property

9.0 LIMITATIONS AND NOTIFICATIONS

NORTECH provides a level of service that is performed within the standards of care and competence of the environmental engineering profession. However, it must be recognized that limitations exist within any site investigation or assessment. This report provides results based on a restricted work scope and from the analysis and observation of a limited number of samples. Therefore, while it is our opinion that these limitations are reasonable and adequate for the purposes of this report, actual site conditions may differ. Specifically, the unknown nature of exact subsurface physical conditions, sampling locations, the analytical procedures' inherent limitations, as well as financial and time constraints are limiting factors.

The report is a record of observations and measurements made on the subject site as described. The data should be considered representative only of the time the site investigation was completed. No other warranty or presentation, either expressed or implied, is included or intended. This report is prepared for the exclusive use of the United States Forest Service. If it is made available to others, it should be for information on factual data only, and not as a warranty of conditions, such as those interpreted from the results presented or discussed in the report. We certify that except as specifically noted in this report, all statements and data appearing in this report are in conformance with ADEC's Standard Sampling Procedures. ***NORTECH*** has performed the work, made the findings, and proposed the recommendations described in this report in accordance with generally accepted environmental engineering practices.

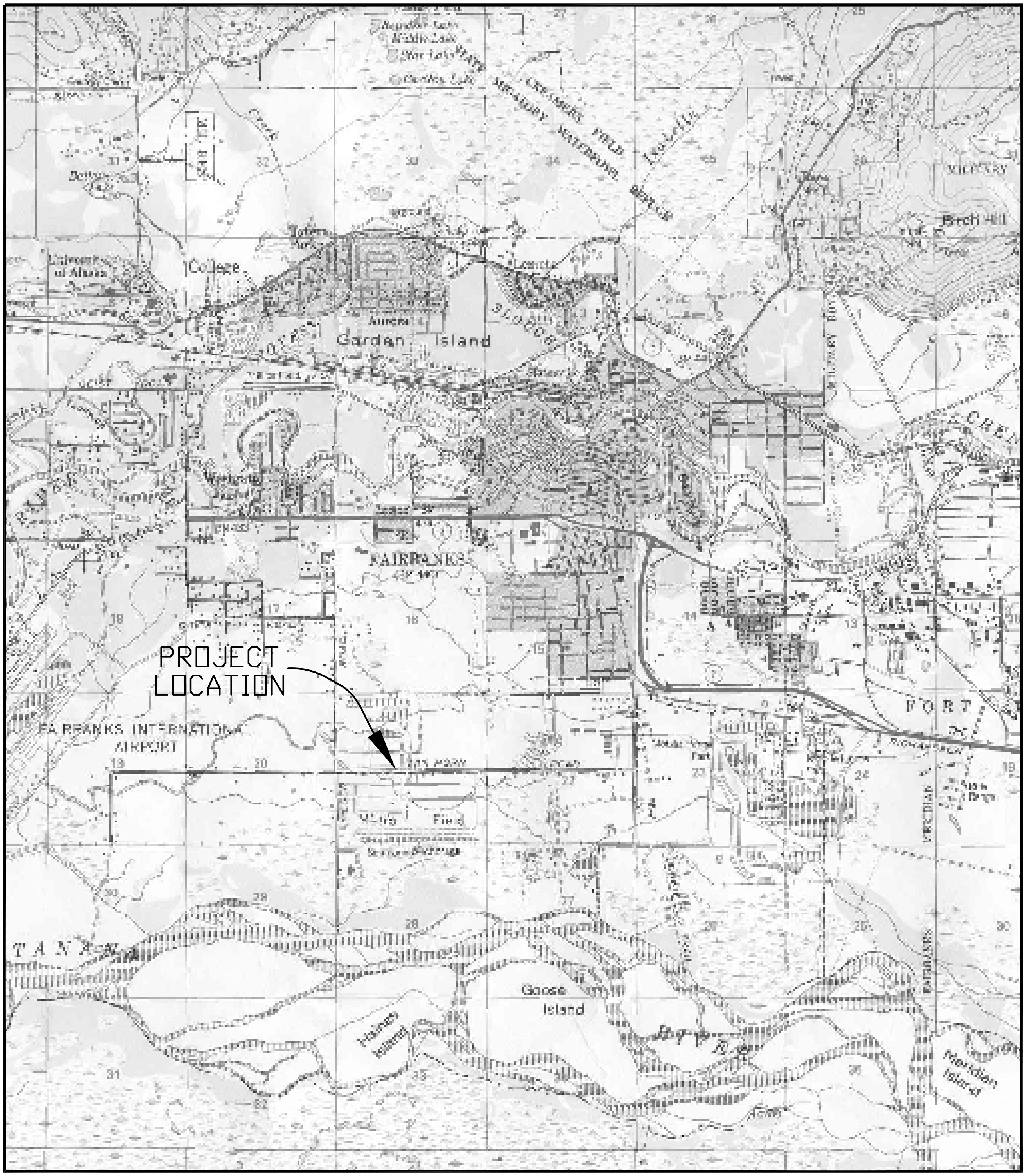
10.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

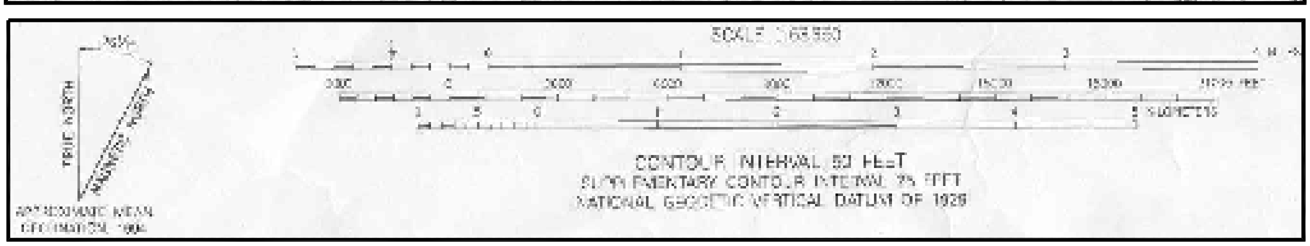
Ronald Pratt, Environmental Scientist for ***NORTECH,*** has a B.S. in Geography and Masters in Environmental Studies. He has extensive experience conducting environmental assessments, hazardous materials investigations, remedial investigations, and other environmental fieldwork throughout California, Washington, and Alaska.

Ronald J. Pratt
Environmental Scientist

Peter Beardsley, PE, Environmental Engineer for ***NORTECH*** has a B.S. degree in Environmental Engineering and is a registered Civil Engineer in Alaska. He has worked on all aspects of environmental investigations and cleanup efforts and is well versed in ESA regulatory requirements.

Peter Beardsley, PE
Environmental Engineer





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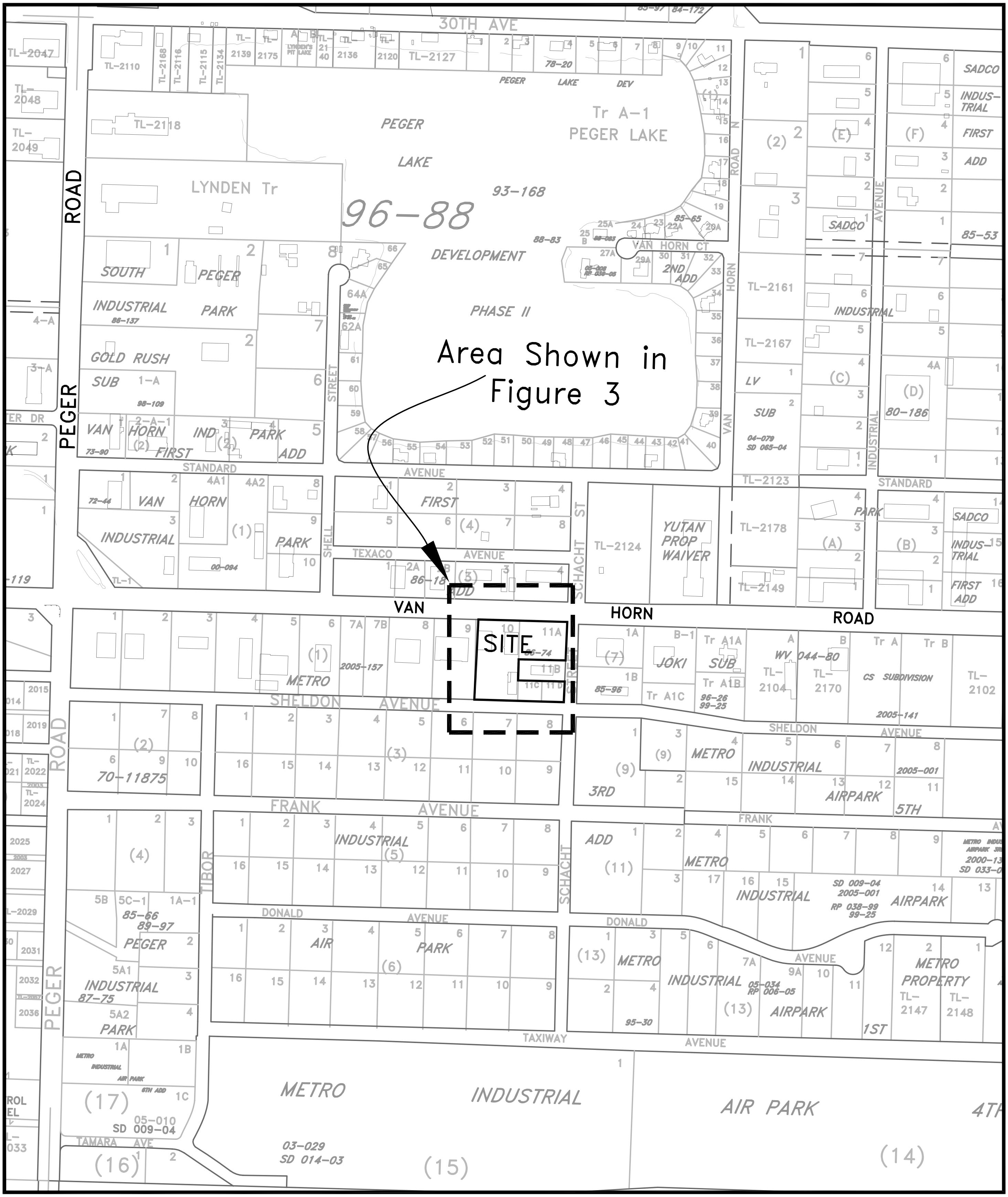
ENVIRONMENTAL & ENGINEERING CONSULTANTS
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694

Location Map
Goetz Lots, Block 1, Metro Ind.
Fairbanks, Alaska

USGS Fairbanks (D-2, SW), AK
1992

FIGURE
1

DATE:	06/21/06
DESIGN:	PLB
DRAWN:	PLB
PROJECT NO:	06-1044
DWG:	061044a(201)
SCALE:	1" = 1mi



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Vicinity Map
Goetz Lots, Block 1, Metro Ind.
Fairbanks, Alaska

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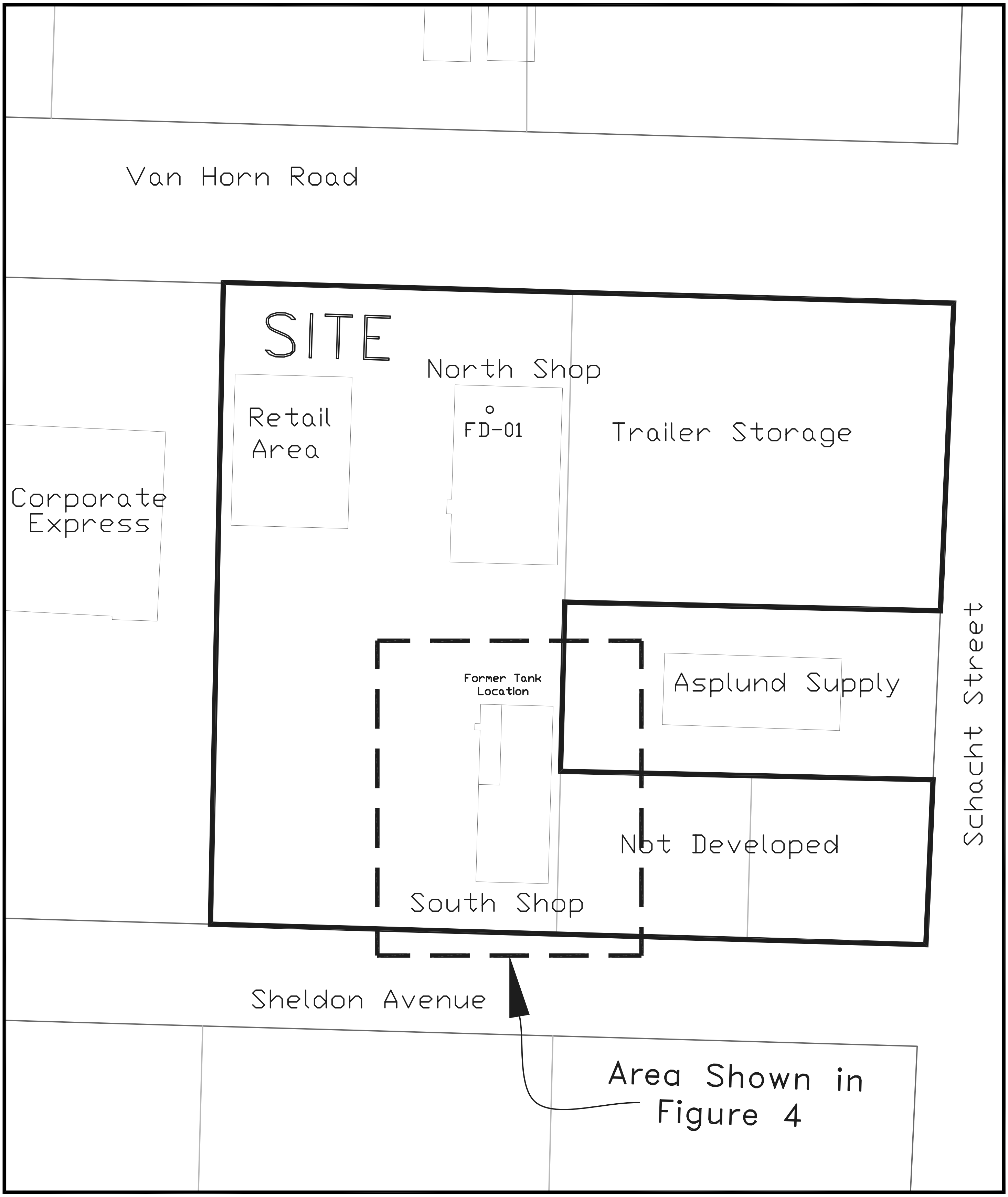
FIGURE 2

DATE:	09/13/06
DESIGN:	PLB
DRAWN:	PLB
PROJECT NO:	06-1044
DWG:	061044a(202)
SCALE:	1" = 600'



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Site Map
Goetz Lots, BLock 1, Metro Ind.
Fairbanks, Alaska

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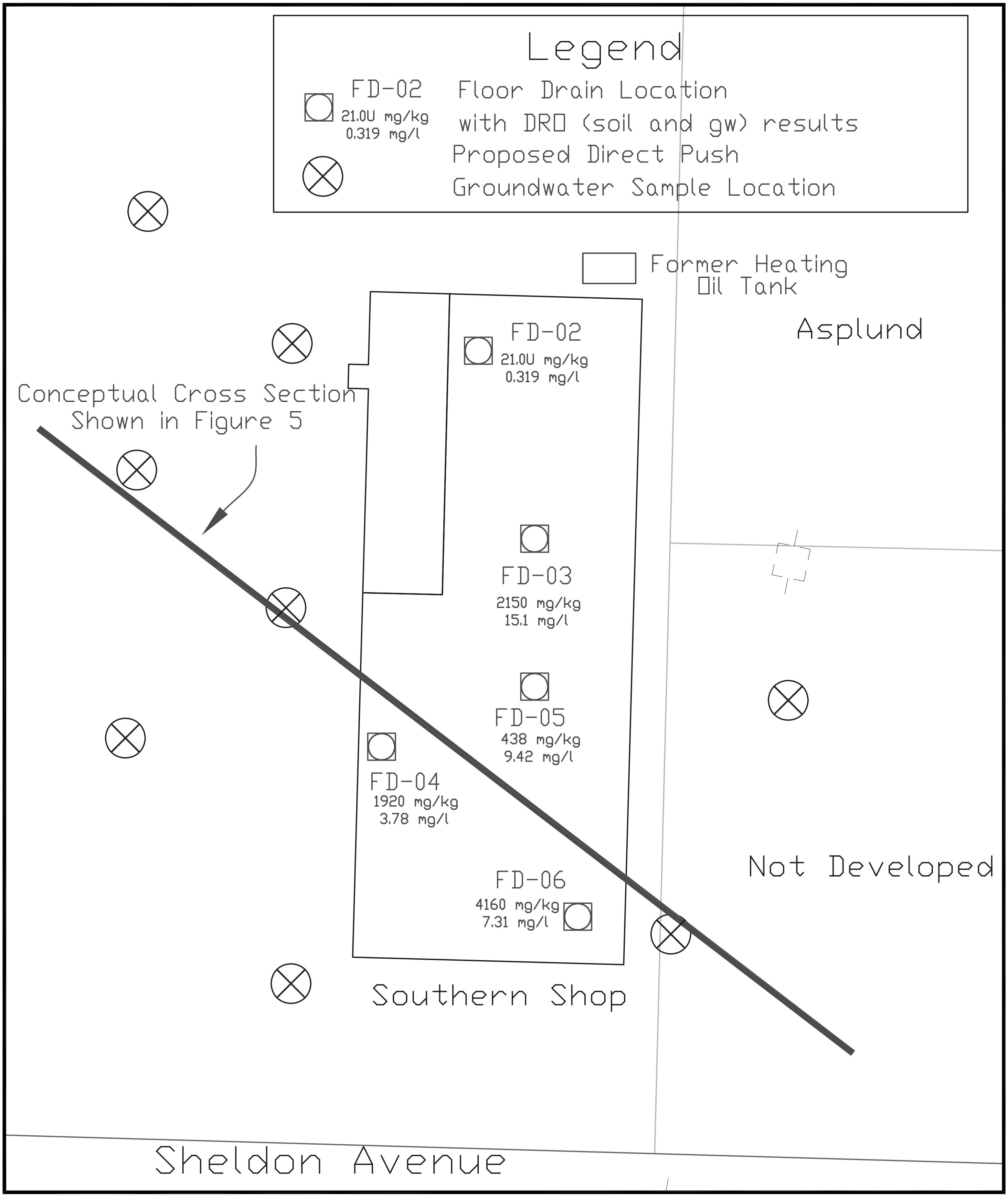
FIGURE 3

DATE:	09/13/06
DESIGN:	PLB
DRAWN:	PLB
PROJECT NO:	06-1044
DWG:	061044a(203)
SCALE:	1" = 75'



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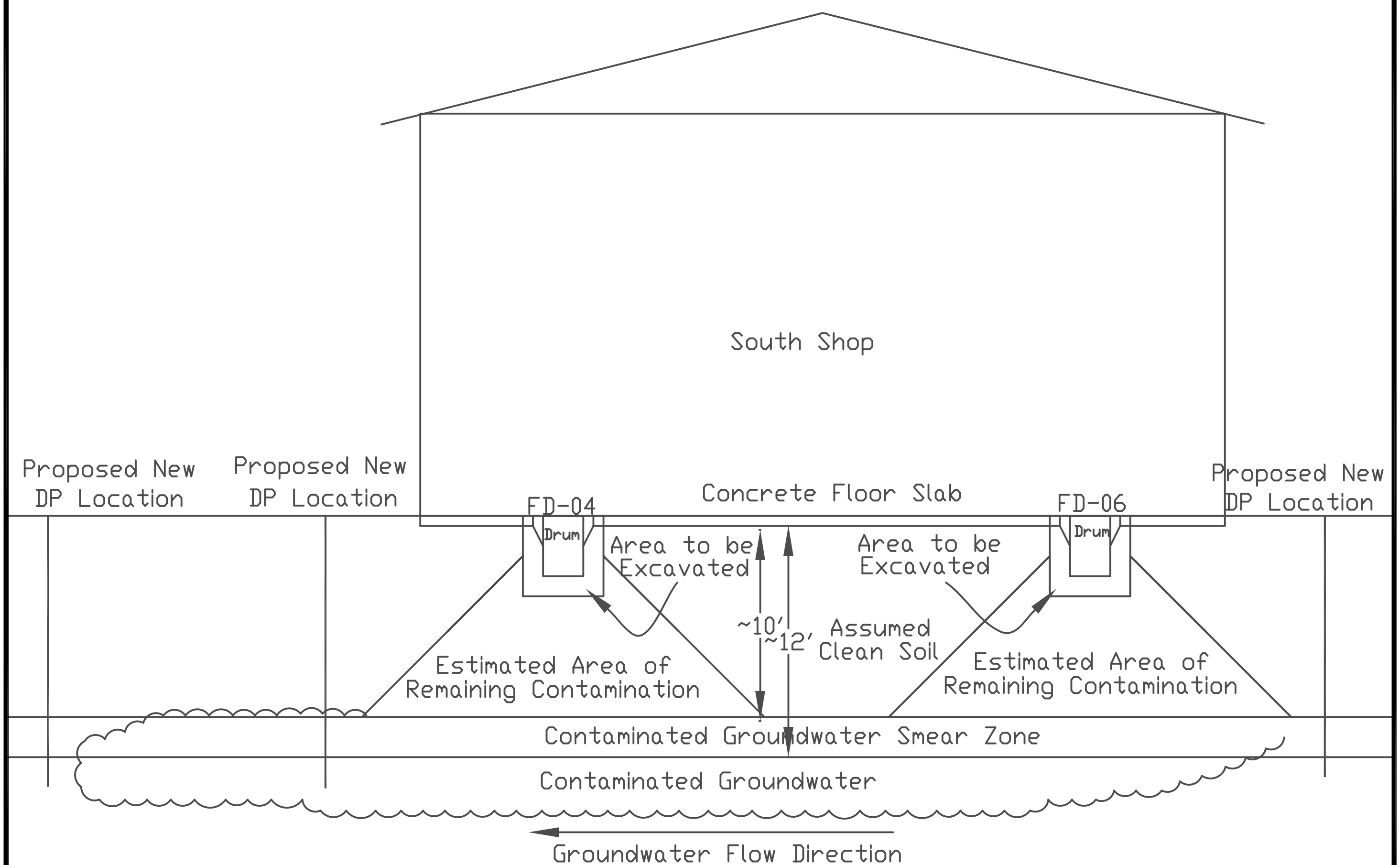
2400 College Road, Fairbanks, Alaska 99709
(907) 452-5688 FAX: (907) 452-5694

South Shop
Goetz Lots, BLock 1, Metro Ind.
Fairbanks, Alaska

N

FIGURE 4

DATE: 09/13/06
DESIGN: PLB
DRAWN: PLB
PROJECT NO: 06-1044
DWG: 061044a(204)
SCALE: 1" = 20'



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2400 College Road, Fairbanks, Alaska 99709
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Conceptual Cross Section
Goetz Lots, BLock 1, Metro Ind.
Fairbanks, Alaska

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FIGURE 5

DATE:	09/16/06
DESIGN:	PLB
DRAWN:	PLB
PROJECT NO:	06-1044
DWG:	061044a(205)
SCALE:	Conceptual

Table 1
Soil Headspace Screening Results

Floor Drain	Depth (feet)	PID (ppm)	Comments
Drum Bottom	3'		
FD-01	3'-4'	69.4	Sample FD-01-S
FD-01	4'-5'	3.5	
FD-01	5'-6'	1.5	
FD-01	6'-7'	1.7	
FD-01	7'-8'	2.1	
FD-01	8'-9'	9.8	
FD-01	9'-10'	2.1	
FD-01	10'-11'	1.1	
FD-01	11'-12'	0.8	
FD-01	12'-13'	0.7	
Drum Bottom	2.5'		
FD-02	2.5'-3.5'	0.5	
FD-02	3.5'-4.5'	1.9	
FD-02	4.5'-5.5'	2.3	Sample FD-02-S
FD-02	5.5'-6.5'	1.2	
FD-02	6.5'-7.5'	2	
FD-02	7.5'-8.5'	1.7	
FD-02	8.5'-9.5'	1.9	
FD-02	9.5'-10.5'	1.1	
FD-02	10.5'-11.5'	1.7	
FD-02	11.5'-12.5'	1.4	
Drum Bottom	3'		
FD-03	3'-4'	98.2	Sample FD-03-S
FD-03	4'-5'	5.1	
FD-03	5'-6'	3.3	
FD-03	6'-7'	2.2	
FD-03	7'-8'	2	
FD-03	8'-9'	14.1	
FD-03	9'-10'	2.1	
FD-03	10'-11'	2.1	
FD-03	11'-12'	0.7	
FD-03	12'-13'	0.1	

Floor Drain	Depth (feet)	PID (ppm)	Comments
Drum Bottom	3'		
FD-04	3'-4'	58.6	
FD-04	4'-5'	277	
FD-04	5'-6'	429	Sample FD-04-S
FD-04	6'-7'	15.2	
FD-04	7'-8'	15.5	
FD-04	8'-9'	3.3	
FD-04	9'-10'	3.1	
FD-04	10'-11'	3.8	
FD-04	11'-12'	3.2	
FD-04	12'-13'	2.2	
Drum Bottom	2.5'		
FD-05	2.5'-3.5'	32.2	
FD-05	3.5'-4.5'	526	
FD-05	4.5'-5.5'	718	
FD-05	5.5'-6.5'	578	
FD-05	6.5'-7.5'	906	Sample FD-05-S
FD-05	7.5'-8.5'	96.2	
FD-05	8.5'-9.5'	32.1	
FD-05	9.5'-10.5'	12.7	
FD-05	10.5'-11.5'	1.9	
FD-05	11.5'-12.5'	1.8	
Drum Bottom	3'		
FD-06	2.5'-3.5'	43.2	Sample FD-06-S
FD-06	3.5'-4.5'	19.9	
FD-06	4.5'-5.5'	12.9	
FD-06	5.5'-6.5'	0.6	
FD-06	6.5'-7.5'	0.9	
FD-06	7.5'-8.5'	22.6	
FD-06	8.5'-9.5'	1.3	
FD-06	9.5'-10.5'	1.8	
FD-06	10.5'-11.5'	0.9	
FD-06	11.5'-12.5'	1.2	
FD-06-Side	0.5'-1.5'	109	
FD-06-Side	1.5'-2.5'	22.3	
FD-06-Side	2.5'-3.5'	10.4	Drum Bottom
FD-06-Side	3.5'-4.5'	27.7	
FD-06-Side	4.5'-5.5'	113	

Table 2
Soil Sampling Analysis Results

Sample ID	ADEC	FD-01-S	FD-02-S	FD-03-S	FD-04-S	FD-05-S	FD-06-S
Analyte	Method 2	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Field Screening Result	ppm	69.4	2.3	98.2	429	906	43.2
Petroleum Fractions and BTEX (Method 8021B)							
GRO	300	1.84U	1.92U	18.4	58	23.8	11.6
DRO	250	39.8	21.0U	**2,150**	**1,920**	**438**	**4,160**
RRO	11000	126	67	2,240	209	89.9	10,700
Benzene	0.02	0.00922U	0.00961U	0.00979U	0.00944U	0.00915U	0.010U
Toluene	5.4	0.0369U	0.0384U	0.0465	0.0499	0.0366U	0.0402U
Ethylbenzene	5.5	0.0369U	0.0384U	0.0392U	0.109	0.0875	0.0402U
Total Xylenes	78	0.0369U	0.0384U	0.4078	1.28	0.3628	0.2135
Polycyclic Aromatic Hyrdocarbons (PAHs, Method 8270C SIMS)							
Phenanthrene	4300	0.0052U	NA	NA	NA	0.215	NA
Flourene	270	0.0052U	NA	NA	NA	0.12	NA
Napthalene	43	0.0052U	NA	NA	NA	0.25	NA
2-Methylnaphthalene	43	0.0052U	NA	NA	NA	0.744	NA
1-Methylnaphthalene	43	0.0052U	NA	NA	NA	0.709	NA
VOCs (Method 8260)							
Dichlorodifluoromethane	60	0.0184	NA	NA	NA	0.0183U	NA
Trichlorofluoromethane	NE	0.0695	NA	NA	NA	0.0183U	NA
Ethylbenzene	5.5	0.0184U	NA	NA	NA	0.0187	NA
Xylenes (total)	78	0.0738U	NA	NA	NA	0.143	NA
Isopropylbenzene	227	0.0184U	NA	NA	NA	0.0291	NA
n-Propylbenzene	NE	0.0184U	NA	NA	NA	0.056	NA
1,3,5-Trimethylbenzene	25	0.0184U	NA	NA	NA	0.228	NA
1,2,4-Trimethylbenzene	95	0.0184U	NA	NA	NA	0.511	NA
sec-Butylbenzene	NE	0.0184U	NA	NA	NA	0.0706	NA
4-Isopropyltoluene	NE	0.0184U	NA	NA	NA	0.0682	NA
n-Butylbenzene	NE	0.0184U	NA	NA	NA	0.136	NA
Napthalene	43	0.0369U	NA	NA	NA	0.722	NA

U	Analyte not detected at the listed detection limit
NA	Analyte not analyzed for
Shade	Analyte detected in concentration below the ADEC Cleanup level
Bold	Analyte detected in concentration exceeding the ADEC Cleanup level
NE	Cleanup Level for listed Analyte has not been established

Table 3
Groundwater Sampling Analysis Results

Sample ID	ADEC	FD-01-W	FD-02-W	FD-03-W	FD-04-W	FD-05-W	FD-06-W	Dup
Analyte	Limit	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Petroleum Fractions and BTEX (Method 8021B)								
GRO	1.3	0.10U	0.10U	0.10U	0.10U	0.18	0.10U	0.10U
DRO	1.5	0.303U	0.319U	**15.1**	**3.78**	**9.42**	**6.16**	**7.31**
RRO	1.1	0.505U	0.532U	0.692	1.01	0.581U	**1.3**	**1.13**
Benzene	0.005	0.0005U	0.0005U	0.0005U	0.0005U	0.00154	0.00104	0.00126
Toluene	1	0.002U	0.002U	0.002U	0.00412	0.002U	0.002U	0.002U
Ethylbenzene	0.7	0.002U	0.002U	0.002U	0.002U	0.0199	0.002U	0.002U
Total Xylenes	10	0.002U	0.002U	0.002U	0.002U	0.04072	0.002U	0.002U
VOCs (Method 8260B)								
Dichlorodifluoromethane	7.3	0.001U	0.0111	0.0018	0.001U	0.001U	0.001U	NA
Chloromethane	NE	0.001U	0.00111	0.001U	0.001U	0.001U	0.001U	NA
cis-1,2-Dichloroethene	0.07	0.00104	0.001U	0.001U	0.001U	0.001U	0.001U	NA
Benzene	0.005	0.0004U	0.0004U	0.0004U	0.0004U	0.0015	0.00095	NA
Trichloroethene	0.005	0.001U	0.001U	0.001U	0.001U	0.001U	0.00242	NA
Toluene	1	0.0005U	0.001U	0.001U	0.00375	0.001U	0.001U	NA
Tetrachloroethene	0.005	0.001U	0.001U	0.001U	0.001U	0.001U	0.00319	NA
Ethylbenzene	0.7	0.001U	0.001U	0.001U	0.001U	0.0315	0.001U	NA
Xylenes (total)	10	0.002U	0.002U	0.002U	0.002U	0.0531	0.002U	NA
Isopropylbenzene	3.65	0.001U	0.001U	0.001U	0.001U	0.00765	0.001U	NA
n-Propylbenzene	NE	0.001U	0.001U	0.001U	0.001U	0.0068	0.001U	NA
1,3,5-Trimethylbenzene	1.85	0.001U	0.001U	0.001U	0.001U	0.0145	0.001U	NA
1,2,4-Trimethylbenzene	0.07	0.00153	0.001U	0.001U	0.001U	0.0524	0.001U	NA
sec-Butylbenzene	NE	0.001U	0.001U	0.001U	0.001U	0.00113	0.001U	NA
4-Isopropyltoluene	NE	0.001U	0.001U	0.001U	0.001U	0.00128	0.001U	NA
Napthalene (8260)	1.46	0.002U	0.002U	0.002U	0.002U	0.00957	0.00336	NA

U	Analyte not detected at the listed detection limit
NA	Analyte not analyzed for
Shade	Analyte detected in concentration below the ADEC Cleanup level
Bold	Analyte detected in concentration exceeding the ADEC Cleanup level
NE	Cleanup Level for listed Analyte has not been established

Table 4
Metals Concentrations

Soil Results

Sample ID / Analyte	ADEC Meth 2	Back-ground	FD-01-S mg/Kg	FD-02-S mg/Kg	FD-03-S mg/Kg	FD-04-S mg/Kg	FD-05-S mg/Kg	FD-06-S mg/Kg
Arsenic	2	14	***5.34***	NT	NT	NT	***3.0***	NT
Barium	1100	115	80.9	NT	NT	NT	51.3	NT
Cadmium	5	1.8	0.311	NT	NT	NT	0.211U	NT
Chromium	26	11.6	15.7	NT	NT	NT	11.6	NT
Lead	1000	26	3.72	NT	NT	NT	2.28	NT
Mercury	1.4	NA	0.0412U	NT	NT	NT	0.0414U	NT
Selenium	3.5	NA	0.518U	NT	NT	NT	0.698	NT
Silver	21	NA	0.104U	NT	NT	NT	0.106U	NT

Groundwater Results

Sample ID / Analyte	ADEC Standard	Back-Ground	FD-01-W mg/l	FD-02-W mg/l	FD-03-W mg/l	FD-04 mg/l	FD-05-W mg/l	FD-06-W mg/l
Arsenic	0.05	0.072	***0.0628***	0.0131	NT	0.0493	NT	0.0213
Barium	2	0.988	0.923	0.273	NT	0.501	NT	0.299
Cadmium	0.005	0.009	0.002U	0.002U	NT	0.002U	NT	0.002U
Chromium (tot)	0.1	0.125	**0.142**	0.004U	NT	0.0223	NT	0.0158
Lead	0.015	0.066	***0.0543***	0.001U	NT	0.00757	NT	0.0045
Mercury	0.002	NA	0.0002U	0.002U	NT	0.002U	NT	0.002U
Selenium	0.05	NA	0.0101	0.010U	NT	0.010U	NT	0.0128
Silver	0.18	NA	0.002U	0.002U	NT	0.002U	NT	0.002U

U	Analyte not detected at the listed detection limit
NA	Analyte not analyzed for
Shade	Analyte detected in concentration below the ADEC Cleanup level
Bold	Analyte detected in concentration exceeding the ADEC Cleanup level
BIU	Concentration exceeds ADEC cleanup level but is below background
NT	Analyte not tested for in sample
NA	Background level not caclulated

Table 5
Quality Control Summary

Sample ID	FD-06-W	Duplicate	Average	Difference	RPD
Analyte	mg/L	mg/L	mg/L	mg/L	%
GRO	0.10U	0.10U	NA	NA	NA
DRO	6.16	7.31	6.74	1.15	17%
RRO	1.30	1.13	1.22	-0.17	-14%
B	0.00104	0.00126	0.00115	0.00022	19%
T	0.002U	0.002U	NA	NA	NA
E	0.002U	0.002U	NA	NA	NA
X	0.002U	0.002U	NA	NA	NA

NA The calculation is not applicable.
RPD Relative percent difference