# INITIAL SITE CHARACTERIZATION REPORT

# 801 VAN HORN ROAD
# FAIRBANKS, ALASKA

## MAY 5, 2009

Prepared For:

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# TABLE OF CONTENTS

# APPENDICES

## 1.0 EXECUTIVE SUMMARY

***NORTECH*** has completed building demolition and initial site characterization at 801 Van Horn Drive in Fairbanks, Alaska. The site is currently being developed by NC Machinery Company as a sales and maintenance facility for heavy equipment, with construction of the new facility currently planned to start in 2010. This area was originally developed as part the Tennessee Miller Subdivision and was used by a gravel mining and trucking operation, primarily during construction of the Trans Alaska Pipeline. NC Machinery completed a Phase I which indicated that DRO contaminated soil had been spread on the site or nearby as part of remediation efforts on other parcels within the original Tennessee Miller Subdivision. Phase II field screening and laboratory sampling during the geotechnical investigation indicated that a very limited quantity of DRO contamination was present at a location well outside the building footprint. Overall, these reports concluded that other small pockets of contamination may be encountered during construction activities at the site.

Two areas of contamination were identified at the site during preparation for construction of the new facility. The first of these is a small area located near a former concrete slab and is believed to be related to an activity at that former building. This area had elevated field screening results, but no visibly stained soil was observed. Olfactory observations indicate that the contamination was consistent with diesel fuel. Field screening was used to segregate approximately 20 cubic yards from the ground surface and the berm pushed up by the bulldozer working in this area. Field screening results at the limits of excavation were less than 5 ppm, indicating that the contaminated soil had been removed. This material was placed in a short-term stockpile at the site and excavation of the area continued without encountering additional contaminated soil.

The second area of soil contamination was identified during slope stabilization at the western edge of the new building limits. This contamination extends at least seven feet below grade into a saturated silt layer. This is also consistent with weathered diesel fuel or heating oil and is not directly linked to the first area. Equipment operators indicated that no tanks, drains, or other potential sources of the contamination were observed during excavation activities. Review of available documents did not identify any obvious sources, but indicated that this area was used extensively for storage of vehicles and equipment during operations in the late 1970s and early 1980s. The contamination observed in this area was also not consistent with that expected from the spreading of contaminated soil under an ADEC approved work plan. Overall, the source of this release has not been identified, but the source has been stopped and additional source identification is not considered necessary.

The contaminated soil excavation activities completed in 2008 were intended as a limited corrective action to reduce the likelihood of having to excavate additional soil within the structural prism of the planned building. These efforts resulted in the removal of 800 to 1,000 cubic yards of contaminated soil from the vadose zone (between the ground surface and the top of the groundwater smear zone). The contaminated soil that was excavated was placed in a stockpile during the winter while appropriate remediation alternatives have been under review. Laboratory results from the limits of excavation indicated five of the six sidewall sample locations met the ADEC cleanup levels for petroleum fractions and VOCs. The sixth location has a benzene concentration slightly above the ADEC cleanup level. Excavation is recommended to remove the limited amount of benzene contaminated soil that remains at this one location and laboratory analysis for closure samples should be limited to benzene.

The excavation extended about six feet below grade to the top of the smear zone, which was generally observed to be the top of the layer of fine silt. Although this layer was observed to be saturated, a water sample could not be collected due to the extremely low recharge rate in a temporary well. Results from a soil sample indicate that diesel range organics (DRO), benzene, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene exceed the ADEC Cleanup Levels at the top of the silt layer. A test pit in another area of the building footprint found that the silt layer extends to at least 14 feet below the ground surface.

While the silt layer is saturated, this material is not considered representative of the higher hydraulic conductivity regional aquifer that underlies the area and is exposed at several nearby gravel pits. Similar silt layers and lenses have been observed above the gravel aquifer at other properties in the area. While the silt layer is contaminated, off-site migration in this material is considered unlikely due to the low flow rate of water through the fine silt material. Groundwater characterization and delineation at this site should evaluate both the silt and gravel layers to accurately assess the risk of the contamination that has been observed.

The groundwater characterization effort should include review of the existing geotechnical boring logs with additional soil borings to confirm the thickness of the silt layer and identify the depth of the gravel aquifer. Field screening and soil samples are expected to be necessary to characterize the silt layer due to the low flow rates observed. Standard groundwater sampling techniques are recommended in the saturated gravel layer. Direct push methodology is expected to be most efficient for completing this assessment and will also minimize the amount of investigation derived waste. Section 6.5.3 and Figure 5 provide a detailed groundwater characterization plan that should be submitted to ADEC for comment and approval. Execution of this work plan is recommended during 2009.

As indicated above, a limited area with only benzene contamination is present in the vadose zone and removal of this material is recommended. In the groundwater smear zone, five contaminants exceed the cleanup soil cleanup levels. No groundwater samples have been collected at this time. A preliminary conceptual site model (CSM) was developed using this data to identify potential exposure pathways to the smear zone contamination. The CSM indicates that the primary exposure concern is workers performing characterization and corrective action. Migration from the smear zone to outdoor air is also a potential exposure pathway, but is generally not a significant concern at similar industrial facilities. Migration to indoor air is also a potential exposure pathway and additional data is needed to fully evaluate this pathway. The data from the recommended groundwater characterization program is expected to be adequate to refine the CSM and complete the evaluation of the potential exposure pathways.

At this time, an estimated 800 to 1000 cubic yards of contaminated soil is stockpiled at the site in accordance with ADEC short-term stockpile guidance. Thermal remediation and landfarming are the two primary soil remediation methods in Fairbanks. Thermal remediation is normally undertaken at a fixed, off-site facility and is typically both more expedient and more expensive than landfarming. Landfarming requires adequate space and a multi-year management plan, but allows for site specific cleanup levels (if applicable) and generally costs less, particularly if equipment and labor for tilling is readily available. Landfarming is the recommended treatment method at this site because the relatively coarse sand and gravel are expected to be treated relatively quickly, site plans show sufficient unused space for a landfarm, equipment and labor are expected to be readily available, and NC Machinery is committed to the site as a long-term owner. Development and execution of the landfarm work plan is recommended for 2009 to cost effectively stay in compliance with ADEC stockpile guidance and start remediation. If started in 2009, the remediation may be complete by the time the facility opens following construction in 2010/2011.

## 2.0 PROJECT LOCATION AND PREVIOUS INVESTIGATIONS

***NORTECH*** was contracted by the NC Machinery Company (NC Machinery) to characterize and manage remediation of a petroleum release discovered during construction of a new maintenance and retail facility for NC Machinery. The Site is located at 801 Van Horn Road in Fairbanks, Alaska (Figures 1 & 2). This area has been replatted several times in the past few years. This area was originally part of the Tennessee Miller Subdivision and was previously occupied by Frontier Trucking and related companies during the 1970s and early 1980s. This operation ceased in the mid-1980s and the property was dormant until approximately 2000 when redevelopment and cleanup of the physical property as well as the environmental concerns was started.

**2007 Phase I and Phase II**

NC Machinery completed a Phase I ESA and additional Phase II activities in 2007, prior beginning construction for the new facility. The Phase I ESA identified a number of concerns, including landspreading of DRO contaminated soil as part of remediation associated with previous development within the Tennessee Miller Subdivision. Based on the documented historical activities at the Site, the Phase I ESA indicated that small areas of DRO contaminated soil may be present at the Site, but no large scale contamination was known or suspected to be present. Due to the potential DRO concerns, the Phase I ESA recommended field screening with laboratory sampling of any suspect locations during the geotechnical borings planned to evaluate the structural needs for construction at the Site.

During the geotechnical borings in 2007, slightly elevated field screening results were observed in one boring (TB19) on parcel F8 in the southeast portion of the NC Machinery property. Laboratory testing indicated that the DRO concentration exceeded the ADEC Cleanup levels, while GRO was well below ADEC cleanup levels and BTEX compounds were not detected. These elevated results were observed in the peat layer present at four feet below grade, but not in the sand/gravel layer observed at two feet or the silt layer observed at six feet.

A follow-up test pit in this area indicated a petroleum odor was present during the initial excavation, but odor reportedly dissipated in a few minutes. No obvious signs of contamination were observed within the test pit and elevated field screening results were not observed during field screening of the different layers of material observed in the test pit. Based on these observations, the location of TB19 a significant distance from the planned development, and the previous ADEC closure issued for the property, no further activities were recommended to investigate this location or the remainder of the site.

**2008 Hazardous Building Materials and Tank Removal**

***NORTECH*** was contacted by Roger Hickel Construction in August 2008 to complete a hazardous building material assessment prior to demolition of a small structure during clearing of the site. During the course of building removal, a pipe was observed sticking out of the ground near the building. The pipe was determined to be a fill pipe for a buried heating oil tank for the building. The tank was constructed of a 40-foot section of 48” diameter pipe that appeared to be similar to the pipe used to construct the Trans-Alaska Pipeline. The ends were sealed with welded steel caps. ***NORTECH*** completed field screening during removal of the heating oil tank. No evidence of a release was observed and no closure notice or assessment report for this tank removal was considered necessary.

## 3.0 OBJECTIVES AND METHODOLOGY

Suspected petroleum contamination was identified at two different locations during the first phase of site work. The first was an area observed during the excavation and removal of an existing foundation slab. The second was near the western edge of the footprint of the new building. ***NORTECH*** conducted field screening of these areas to identify potentially contaminated soil. Contaminated soil was segregated according to the field screening results and stockpiled for subsequent characterization and disposal. The objectives of the field screening and sampling efforts were to:

- Delineate and segregate POL-contaminated soils to prevent improper disposal of these soils or contamination of previously uncontaminated areas
- Minimize potential for contaminant exposure to workers and the general public
- Characterize extents of contamination to facilitate the incorporation of these concerns into the long-term development and management of the site

This report summarizes ***NORTECH***'s investigation, findings, analysis, and recommendations based on the data available at the site. The field activities undertaken during this effort were undertaken to complete an initial delineation and removal of the contaminated soil to allow construction of the new facility to proceed without interruption. The construction of the facility is currently expected to begin in 2010. The following sections briefly summarize the major components of each field methodology.

### 3.1 Organization and Responsibilities

The property is owned by NC Machinery Company, which plans to construct a new sales and maintenance facility. Roger Hickel Construction, Inc., of Anchorage, Alaska, is the prime contractor for the construction project and Exclusive Paving, of Fairbanks, Alaska is the primary excavation contractor for this project. ***NORTECH*** has been contracted by NC Machinery to manage the environmental concerns identified during construction activities.

Peter Beardsley, PE, Environmental Engineer of ***NORTECH***, is the Project Manager and in responsible charge of the project, including administrative management and quality control. Mr. Beardsley is the principal point of contact and oversaw the input and efforts provided by each of the other ***NORTECH*** employees involved with the work. Additional ***NORTECH*** personnel that were involved with the field work included Dennis Shepard and Ron Pratt. Resumes and qualifications of these individuals are available upon request.

## 3.2 Contaminated Soil Excavation and Handling

As indicated above, Exclusive Paving is the excavation contactor for this project. Exclusive provided equipment to delineate and excavate the contaminated soil and transfer this material to a stockpile location on the southeast corner of the site. Exclusive and Roger Hickel Construction were responsible for identifying the stockpile location and the construction of the stockpile. The stockpile was constructed in general accordance with ADEC short-term stockpile guidelines as remediation of the material was expected to begin during the summer of 2009.

## 3.3 Field Screening Equipment and Procedures

Field screening was completed in general accordance with the ADEC UST Procedures Manual and Standard Sampling Procedures (SSP). A PhotoVac 2020 Hand Held Air Monitor/Photoionization Detector (PID) was used to field screen the soils for POL contamination. The PID is the field-screening instrument of choice as it allows for semi-quantitative real time (< 10 minutes) analysis. The PID was calibrated to a certified isobutylene gas standard and the unit was calibrated in accordance with the manufacturer's specifications.

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 but not more than one hour. The bag was agitated at the beginning and end of the headspace development period. The soil and headspace were tested at a minimum temperature of at least 40 degrees F (5 degrees C), determined by touch, and sometimes required a brief warming period inside the field vehicle. In accordance with the SSP, the highest PID reading from each sample was recorded. Field screening locations were selected based on visual and olfactory observations at a horizontal and vertical frequency appropriate to delineate the suspected contamination.

## 3.4 Lab Sampling and Analytical Procedures

Soil samples were collected to determine the concentration of contaminants of concern at the site. Soil sampling was conducted following ADEC procedures outlined in the SSP, including the use of clean equipment, laboratory provided sample containers, immediate chilling of samples, and chain of custody documentation.

The source of the contamination was not known. The initial samples were collected and submitted to evaluate the potential for petroleum and solvent contamination. These samples were submitted to Test America Laboratories in Anchorage, Alaska and Bothell, Washington with an expedited turnaround for the following constituents:

- Diesel Range Organics (DRO) by Alaska Method AK 102 (Anchorage)
- Residual Range Organics (RRO) by Alaska Method AK 103 (Anchorage)
- Volatile Organic Compounds (VOCs) by EPA Method 8260 (Bothell)

These results indicated that the contamination was petroleum related and generally consistent with diesel fuel or heating oil. Based on the ADEC guidance for this type of release, the remaining site characterization results were submitted to SGS Environmental Services in Anchorage, Alaska and analyzed for the following constituents:

- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) by EPA Method 8021B
- Diesel Range Organics (DRO) by Alaska Method AK 102

After identification that the quantity of contaminated soil was significantly greater than the planned quantity and groundwater contamination was present, a sample for polycyclic aromatic hydrocarbon (PAH) analysis was collected to provide additional data for risk-based closure. The sample was collected from the highest field screening location and analyzed for:

- Polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8270 SIMS

### 3.5 Soil and Groundwater Cleanup Levels

The ADEC Method Two soil cleanup levels are typically used as cleanup goals for sites managed through the ADEC spills and contaminated sites programs and are provided in 18 AAC 75. The Method Two soil cleanup levels have been developed to be protective of human health and the environment under the wide range of conditions found in Alaska. The site cleanup rules for this project were determined these regulations.

Fairbanks is located in the under 40-inch zone and the most conservative cleanup levels are generally for migration to groundwater. The Method Two soil cleanup levels in the under 40-inch zone (revised in 2008) are shown below and also in Table 1 to evaluate the sample results. Cleanup levels for the detected PAH compounds are shown in Table 1.

**ADEC Cleanup Level Summary**

| Analyte | DRO (mg/kg) | Benzene (mg/kg) | Toluene (mg/kg) | Ethylbenzene (mg/kg) | Total Xylenes (mg/kg) |
|---|---|---|---|---|---|
| **Proposed Method 2** | 250 | 0.025 | 6.5 | 6.9 | 63 |

As discussed above, this report uses the Method Two soil cleanup to evaluate the results for this site. ADEC regulations also provide for site-specific alternative cleanup levels to be used on sites based on site-specific soil characteristics and a number of other parameters. ADEC Method Three and ADEC Method Four provide approaches for developing site-specific, risk-based alternative cleanup levels for a site. The use of Method Two for evaluation purposes in this report does not preclude the future development of alternative cleanup levels for this site using either of the ADEC risk assessment approaches.

## 4.0 FIELD ACTIVITIES

**September 3, 2008**
***NORTECH*** personnel were contacted by Roger Hickel Construction to assess a suspected area of soil contamination near an existing foundation pad that was being demolished. Field screening was conducted of the undisturbed soil along the eastern edge of the existing foundation pad and of the soil material that had been removed from this area during excavation. Field screening results showed elevated readings in a limited zone of soil beneath the foundation slab and in the soil material which had been previously removed from this area. A total of approximately 20 cubic yards of suspect contaminated soil was associated with this area. The original quantity of contaminated soil appeared to have been less than five cubic yards and the higher total was the result of inadvertent mixing with clean soil by the bulldozer prior to observation of the contamination. This contaminated material was segregated and stockpiled in accordance with ADEC short-term stockpile guidance at the Site for later treatment. Field screening results at the limits of excavation indicated that no contaminated soil remained in this area. Mass excavation for the foundation pad resumed after field screening indicated that the suspected contamination had been removed. Laboratory samples were not requested based on the previous documentation of small areas of DRO contamination across the property.

**September 10 – 15, 2008**
A second area of suspected soil contamination was discovered on September 10, 2008 at the western edge of the mass excavation area. This suspect contamination was reported during sloping of the excavation sidewall to make the excavation safer for

construction activities. This second area was located at the western edge of the excavation beneath a planned parking area outside the footprint of the building. ***NORTECH*** personnel were contacted to conduct field screening and characterization soil sampling of this area. Based on the field observations, Exclusive Paving planned to excavate the limited amount of contaminated soil within the project design limits to facilitate assessment the following day.

On September 11, 2008, ***NORTECH*** personnel mobilized to the Site to conduct field screening and delineation of contaminated soil at this second area of suspected contamination. Upon arrival at the site, obvious soil staining and olfactory indications of petroleum contamination were observed on bottom and most sidewalls of the excavation in this area. The contaminated portion of the excavation had a surface area of approximately 1,450 square feet. The excavation was about five feet deep with the exception of a bench in the southeastern area which measured about 2.5 feet deep. Based on these dimensions, an additional 250 cubic yards of contaminated soil material had been added to the existing stockpile. Visual and olfactory indications of contamination were also observed in the excavation sidewalls throughout most of the excavated area.

The sidewalls of the excavation showed at least one layer of imported gravel fill over naturally deposited sand in some areas. These layers were each generally brown and they were separated by a thin layer of peaty organics in most areas. At about five feet deep, the material switched to very fine silt that was dark gray and appeared to be generally moist. This material was saturated at approximately six feet below the ground surface (one foot below the bottom of the excavation). A total of 22 field screening samples were collected from the excavation bottom and sidewalls at varying depths to assess these different materials. PID results ranged from 13.6 to 1148 parts per million (ppm), as shown. Only five locations were below 100 ppm and most of these were along the northern edge of the excavation. These elevated field screening results confirmed that soil contamination was present throughout the different layers across the excavated area. No obvious source had been observed during the excavation and none could be discerned from the available data.

On September 15, 2008, ***NORTECH*** personnel mobilized to the site to collect laboratory soil samples from the area of excavation for contaminant characterization. Based on discussions with the site owners, expedited sample analysis was planned to characterize the contaminants of concern in this area prior to continuing with excavation in this area. Samples were collected for DRO and VOC analysis to determine if the contamination contained any chlorinated solvents in addition to the petroleum.

Three samples were collected from the locations with the highest field screening results within the three different soil types identified at the site: silt, sandy gravel, and sand. The sample S1 was collected from the moist silt at the excavation bottom, about five

feet bgs. Sample S2 was collected from the sandy gravel fill, about two feet bgs. Sample S3 was collected from the natural sand layer beneath the peaty organics at approximately 2.5 feet bgs. Sample locations are shown in Figure 4.

**September 15 to 24**
During this period, ***NORTECH*** and NC Machinery reviewed the previous investigations, surveys, and other files to try to determine the source of the contamination. No building, tanks, or other obvious source of contamination was identified or reported to have been present in this area. The lab results indicated that this release was consistent with diesel fuel and/or heating oil and no chlorinated solvents were present. ***NORTECH*** also discussed the site with ADEC to formulate a plan to address the contamination and not delay the planned construction work.

**September 24-26, 2008**
On September 24, 2008, ***NORTECH*** met with representatives of Roger Hickel Construction and ADEC at the Site to discuss the initial characterization sampling results and establish a course of remedial action for the site. A temporary well point was installed in the smear zone soil to collect a sample of the groundwater. This well point had an extremely low recharge rate and the sampling effort was abandoned. Three exploratory trenches were excavated to the west and south of the known area of contamination to determine the extent of contaminated soil remaining above the water table (vadose zone contamination). A total of 23 field screening samples were collected from the sidewalls at varying depths within these three trenches. The screening results indicated that vadose contamination was limited to the north and generally decreased to the west and south. Based on these observations, excavation of the contaminated vadose zone soil appeared to be a viable remediation alternative and was planned for the following day.

The remedial excavation and field screening was completed on September 25, 2008. The excavation was limited to a depth of about five feet, the point at which the smear zone silt was encountered. In general, three samples were collected at each sampling location along the excavation sidewall to confirm the removal of the contaminated soil material at varying depths. In the event that screening results indicated that contamination was still present (results greater than 20 ppm), additional excavation was conducted in these areas until the field screening results were less than 20 ppm. A total of 94 field screening samples were collected during the excavation effort. The total surface area of excavation was approximately 4,100 square feet in area. An estimated volume of 800 to 1,000 cubic yards of contaminated soil was excavated from this area.

A total of 22 field screening samples were collected from the excavation bottom to help define the extent of smear zone contaminated soil remaining in place at the limits of excavation. Field screening results from these samples ranged from 3.1 to 983 ppm

(Figure4). Additionally, an exploratory test pit into the groundwater confirmed that the saturated silt collapsed easily and was contaminated to at least six feet below the ground surface. The depth of contamination below the water table could not be determined during these activities and gravel was not encountered in this excavation. These observations indicated that excavation in the smear zone would be difficult and would not be a successful remediation strategy and that delineation of groundwater contamination through soil borings and/or temporary sampling points would be more appropriate.

Laboratory soil samples were collected on September 26, 2008 following review of the field screening from the remedial effort. Samples were collected from the excavation sidewalls to confirm that the contaminated soil material had been removed. A total of seven soil samples (six primary samples and one sample duplicate) were collected from the locations of the highest field screening results (Figure 4). The samples were submitted for DRO and BTEX analysis, the identified COCs at the Site. One additional soil sample (SB1) was collected from the excavation bottom at the location of sample S1 (collected on September 15) and was submitted to the laboratory for polycyclic aromatic hydrocarbon (PAH) analysis. This sample was collected to provide further characterization of the contaminated smear zone soil which remained in place at the limits of excavation.

## 5.0 LABORATORY RESULTS

### 5.1 Initial Results

Three samples were collected on September 15, 2008 to assess and characterize the contamination that was suspected at the property. The summary of compounds detected by the laboratory is shown in Table 1 under “Initial Sampling.” Copies of the laboratory analysis reports are included in Appendix 5.

The laboratory results confirmed the presence of diesel range organics (DRO) contamination in these three samples in concentrations (1,740 mg/kg to 18,160 mg/kg) above the ADEC Method 2 Cleanup Level for soil (250 mg/kg). The results were non-detect for residual range organics (RRO) at a detection limit of 494 mg/kg, well below the ADEC Cleanup Level for soil (10,800 mg/kg). The volatile organic compound (VOC) analysis identified 13 petroleum-related compounds were present at various levels at the three locations. These included benzene, toluene, ethylbenzene, and xylenes (commonly referred to as BTEX) in one or more of the samples. Of these, the benzene concentration in S1 (0.231 mg/kg) was the only BTEX compound to exceed the ADEC Cleanup Level (0.025 mg/kg) in these samples.

A variety of other benzene derivatives were also identified above the laboratory detection limits in one or more of the three samples. The other specific VOCs detected include: 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, n-butylbenzene, sec-butylbenzene, tert-butylbenzene, isopropylbenzene, n-propylbenzene, and p-isopropyltoluene. The highest detected concentration of any of these compounds was below the corresponding ADEC Cleanup Level. No chlorinated solvents were detected in these samples.

Sample SB1 for polycyclic aromatic hydrocarbons (PAHs) was collected from the S1 location during the September 26 sampling event discussed in Section 5.2. Although this sample was collected during the later sampling event, the results are included here with the other S1 results for a more thorough discussion of the S1 location. Five of the PAH indicator compounds were detected, including phenanthrene, fluorene, naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene. The concentrations of three of these compounds (naphthalene, 2-methylnaphthalene, and 1-methylnaphthalene) exceeded their respective ADEC Cleanup Levels.

## 5.2 Confirmation and Closure Results

The results from the initial sampling event confirmed that contamination was limited to petroleum and appeared consistent with a release of diesel fuel. Based on these results, subsequent laboratory analysis was limited to DRO and BTEX. A total of seven soil samples (Ex1 through Ex7) were collected at the limits of the cleanup excavation on September 26, 2008. DRO was not detected in these samples with a maximum detection limit of 109 mg/kg, well below the ADEC Cleanup Level. The only BTEX concentration above an ADEC Cleanup Level was benzene in sample Ex1 (0.0341 mg/kg relative to a cleanup level of 0.025 mg/kg). Ethylbenzene was also detected in this sample at a concentration of 0.172, well below the cleanup level of 6.9 mg/kg. Toluene and xylenes were not detected in Ex1 and no BTEX compounds were detected in Ex2 through Ex7.

## 5.3 Quality Control Summary

The initial field sampling effort was intended to provide a basic assessment of the contaminants of concern in the areas with the highest levels of contamination. This data was used primarily to identify the presence of chlorinated compounds and verify that additional excavation was not going to develop a large quantity of a RCRA hazardous waste. The field methods were consistent with ADEC guidelines and the sample integrity is of adequate quality. An ADEC Laboratory Quality Review Checklist that includes data for each of the two laboratory reports related to this effort is included in Appendix 5. This identifies a few minor surrogate and laboratory control issues related to the high concentrations of petroleum in the sample, but none of these significantly affect the usability of the data as described in this report.

The confirmation field sampling effort was intended to verify that the limits of excavation met the ADEC Cleanup Levels. This activity requires a higher level of quality control than the initial sampling event. The field methods were consistent with ADEC guidelines and the sample integrity is of adequate quality. A field duplicate was collected and each analyte was non-detect in both the primary and duplicate samples, which is acceptable to confirm that the data is of adequate quality. An ADEC Laboratory Quality Review Checklist for the laboratory report from this effort is included in Appendix 5. No issues were found with the EX1 through Ex7 samples and the data is usable as presented. The primary concerns identified in this sampling event are related to PAHs in SB1. This sample was collected to characterize the PAHs at the S1 location, which was known to be contaminated. These quality control issues are not considered significant for this characterization and the data is also usable as presented.

## 6.0 ANALYSIS

***NORTECH*** has completed initial site characterization activities at 801 Van Horn Road in Fairbanks, Alaska. The historical use of the site was related to gravel mining and trucking operations, primarily during construction of the Trans Alaska Pipeline. In more recent years, the buildings have been removed and the surrounding area has been subdivided for redevelopment. The site is currently being developed by NC Machinery Company as a sales and maintenance facility for heavy equipment. ***NORTECH*** completed initial characterization efforts to identify the primary contaminants of concern. After receiving these results, ***NORTECH*** worked with the owner and ADEC to develop an excavation strategy to allow site characterization to occur within minimal impacts to the construction schedule. The field activities were completed in general accordance with ADEC guidance documents and verbal discussions with ADEC personnel.

### 6.1 Former Slab Area

An area with an odor and elevated field screening results was observed near a former concrete slab. Approximately 20 cubic yards of contaminated gravel was removed from a shallow excavation in this area. Initial excavation in this area had been with a bulldozer and the original quantity of contaminated soil was probably less than five cubic yards. The total volume of contaminated soil was inadvertently increased prior to identification by the operator due to the excavation method (bulldozer). The center of the contamination was identified near the slab and the small amount of remaining contaminated soil was subsequently removed and placed in a short term stockpile. Contaminated soil was also segregated from the excavated pile and added to the short term stockpile.

No visibly stained soil was observed and olfactory observations indicated that the contamination was consistent with diesel fuel. No obvious source of the contamination was observed, but it is believed to have resulted from an activity associated with the former building. The highest field screening was 160 ppm. PID readings at the limits of excavation were below 5 ppm following the removal of the apparent source area. Due to the limited quantity and low field screening results, the prime contractor indicated that laboratory samples of this excavation and stockpiled material were not necessary.

## 6.2 Western Edge of New Building

### 6.2.1 Possible Sources

A second area with an odor of petroleum contamination was identified during slope stabilization at the western edge of the new building limits. No obvious source of contamination was identified during the site preparation in this area according to the operators that were present. This area of contamination is located southwest of the former concrete slab that was removed and this contamination was not related to the contamination described in Section 6.1.

Based on a review of readily available aerial photographs, the former slab appears to be the western end of a warehouse that was built between 1964 and 1979. The 1979 photo shows that this second identified area of contamination is near the west end of a truck or trailer parking area located south of the former warehouse. No obvious source of contamination (truck wash area, dispenser system canopy, etc) is visible in this aerial photograph (Figure 6, top). However, this photograph shows the site during an active period of time and vehicles and equipment are stored all around the site, suggesting that the potential for a release of diesel fuel existed during this operation. An aerial photograph from 2006 is also included in Figure 6 (bottom) for comparison to the site at the time of the Phase I ESA.

In addition to the potential for a release from historical uses, diesel contaminated soil was spread across a portion of the former Tract F. This was part of the ADEC approved remediation effort for another contaminated area nearby. The exact location of this land spreading activity on Tract F has not been identified at this time. However, the Phase I ESA indicated that the planned building was not expected to be located in the land spreading area. Additionally, the land spreading was approved by ADEC for low level contaminated soils. The contamination observed is not consistent with the land spreading that was reported.

No potential tanks, drains, or other structures were observed during the excavation that could have been a potential source for this contamination. Based on the field screening results and field observations, the release was most likely related to surface activities during some historical activity at the site. At this time, the source of the release is

believed to have been removed from the property and the release has been stopped. While determining the source of the release could facilitate a future cost recovery effort, no additional effort is recommended to identify the source at this time.

### 6.2.2 Corrective Action – Vadose Zone Soil

Initial investigation in the contamination at the western edge of the planned building indicated that the contamination probably exceeded the 20 cubic yards observed near the slab and that the contamination probably extended to groundwater as well. The excavation was expanded about 25 feet beyond that needed for the new building to provide better characterization of the soils and scope of the contamination, as well as try to remove the most contaminated soils.

During this initial assessment, four distinct layers of material were observed in the area: imported gravel fill to a depth of about 2.5 feet, a thin (<6 inches) layer of peat and organics representing the original site surface, and then a layer of sand grading to fine sand/silt approximately 2 feet thick. At approximately 5 feet below grade, the material changes to very fine silt that has some plasticity, indicating that a trace of clay may also be present. This material becomes saturated at a depth of approximately 6.5 feet below grade, although the recharge rate is extremely slow. A previous exploratory excavation done by Exclusive personnel inside the planned building footprint indicates that the fine silt extends to a depth at least 14 feet below grade. Where saturated, this layer also has very little structure and a test pit into the saturated zone would not remain open once the excavator bucket had been removed.

Field screening and visual observations indicated that the volume of contaminated soil was going to be well over 100 cubic yards and that groundwater had been impacted. In order to characterize the contamination, the three initial samples were collected from the three main soil horizons at the site: gravel, sand, and silt. These results confirmed that petroleum contamination consistent with diesel fuel was present in each of the three layers. Based on the observations of the silt, groundwater at the site was also impacted and the top of the silt layer appeared to be the top of the groundwater smear zone.

These observations were used to develop an excavation plan for removing the remaining soil contamination above the smear zone. This was done to reduce the likelihood that any future excavation near the new building would be necessary. The excavation plan was proposed to ADEC via email and the overall project objective of removing contaminated soil above the top of the smear zone (approximately 5 feet deep) was approved in a meeting at the site. During this meeting, the parties recognized that groundwater delineation and a remediation plan for excavated soil would need to be developed over the winter for execution in 2009.

Excavation began at the end of the meeting. Three assessment trenches were excavated to the west and south to determine the extent of contamination. Field screening results were used to delineate the zone of contamination for excavation and the removal action took place the following day. The remedial excavation resulted in the removal of an estimated total of 800 to 1,000 cubic yards of secondary source contaminated soil from the Site. This material was stockpiled on plastic sheeting and covered securely for the winter.

The closure samples Ex1 – Ex7 are representative of the field screening results at the limits of this excavation. Only one of these samples, Ex1, had a detectable concentration of any of the contaminants of concern. Benzene was detected at a concentration of 0.0341 mg/kg, slightly above the ADEC cleanup level of 0.025 mg/kg. Ethylbenzene was also detected in this sample at a concentration of 0.172 mg/kg, below the ADEC cleanup level of 6.9 mg/kg. No contaminants of concern were detected in the other six samples.

Based on these results, the corrective action was successful at removing most of the contaminated soil above the smear zone. However, since clean sidewalls were not achieved at every location, ADEC is expected to require additional sampling and/or risk assessment for the final closure of this site. Due to the limited contamination that most likely remains at this edge of the excavation, a small excavation of ten yards or less is expected to result in complete removal of the contaminated vadose zone soil at Ex1. Since excavation equipment will be present at the site during construction and soil will most likely be treated at the site, this appears to be a reasonable solution for this site.

However, the benzene concentration at the Ex1 location does not necessarily require an additional corrective action. A limited evaluation of the risk in this area would most likely show that the remaining contamination does not pose a significant risk to human health and the environment. Alternatively, additional assessment through two or three shallow soil borings may show that the disturbance from excavation, backfilling, and compaction was adequate to remediate the soils in the area and that the benzene concentration is now below the cleanup level. If additional excavation is not reasonable for this site, either of these alternatives should be pursued with ADEC.

### 6.2.3 Groundwater Contamination

An undetermined volume of secondary source contaminated soil remains in the smear zone at the site, beginning approximately five feet below grade. The area of smear zone contamination was not fully defined during the project effort, but field screening of the excavation bottom indicates that contaminant concentrations were generally decreasing towards the north, south, and west limits of the vadose zone excavation. Continued excavation of clean vadose zone soil is not considered a cost effective means of delineating smear zone contamination and was not undertaken.

Contaminated sites in this area have historically been difficult to assess due to the tight silt soil formation that is saturated. The silt layer at one nearby site extends to a depth that varies between 8 and 12 feet below grade. At another nearby site, the silt layer retains water and acts as an aquitard at a depth of about eight feet, with a dry gravel layer is present between the bottom of the silt layer and the top of the water table at 12 feet below grade. Pockets of silt have also been observed in this depth range at other nearby sites. While the silt material at this location is saturated, movement of both water and contamination through this material is relatively slow. During this project, a hand-driven well into the silt did not produce enough water for a sample over a several hour period. Due to the slow recharge of water, delineation of the contamination within the silt formation should be done using soil borings with field screening and/or soil sampling.

The regional aquifer is known to have much higher hydraulic conductivity with a gradient generally to the northwest. The higher regional hydraulic conductivity is due to the presence of much coarser sands and gravels across much of the Chena/Tanana floodplain, which are evidenced by the gravel mining operations to the south of the site. The silt layer at the site appears to extend into the top of the regional aquifer that is normally present between 10 and 15 feet below grade. The current data is not adequate to address the potential for contamination in the regional aquifer. This aquifer should be characterized through either soil borings that show the contamination does not extend to the bottom of the silt formation or groundwater samples from the regional gravel aquifer itself. Additional review of the geotechnical reports for this site is recommended to determine the depth of the silt layer and both methods of assessment are recommended to provide the most accurate characterization of the site.

### 6.3 Contaminants of Concern

The known areas of contamination at this site appear to be primarily related to diesel fuel, which is consistent with the known use of the site by a trucking operation. ADEC regulations require testing at diesel releases to include DRO and BTEX compounds at each sample location, with limited testing for PAHs. Since the release had not been documented, the initial samples for this characterization, as well as the 2007 investigation, also included VOCs such as chlorinated solvents. RRO was also included in some samples to determine if heavier oils were also present in the contamination.

During this project and a previous Phase II investigation in 2007, DRO has been suspected as the primary contaminant of concern due to the previous use of the area by a trucking company. During these investigations, DRO has been found several orders of magnitude above the ADEC cleanup level at several locations, even where other analytes have not been found. Based on these results, DRO is considered the

primary contaminant of concern at the site. Since the vadose zone soil confirmation samples did not contain DRO, no additional DRO testing is considered necessary during future vadose zone assessment or corrective action. DRO analysis will be necessary during smear zone and groundwater delineation and characterization.

The VOC results from both 2007 and 2008 indicated that VOC contamination is limited to petroleum related compounds. Chlorinated solvents have not been detected in the three samples located in this area or the other five samples from across the site. A total of 13 petroleum related VOCs have been detected in the smear zone contamination that remains at the site. These include the BTEX compounds, 1,2,4- and 1,3,5-trimethylbenzene, several butyl- and propylbenzene compounds, and naphthalene. Of these VOCs, only benzene (0.231 mg/kg) remains above the ADEC Cleanup Level (0.025 mg/kg) in the smear zone. Benzene also remains slightly above the ADEC Cleanup Level in one location at the limits of the corrective action. Based on these results, the only VOC that remains a contaminant of concern at the site is benzene. Additionally, benzene is the only contaminant of concern that remains in the vadose zone soils. Benzene analysis will be necessary during smear zone and groundwater delineation and characterization.

PAH analysis was completed on the contaminated smear zone soils. Five of the 18 PAHs were detected, with three of these (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene) detected at concentrations that exceed the ADEC cleanup levels. PAH analysis was not considered necessary at the limits of excavation because these heavier compounds do not normally migrate as far as lighter compounds such as benzene. Based on these results, PAHs remain a potential concern in the smear zone. No additional PAH analysis is considered necessary during future vadose zone assessment or corrective action. PAH analysis will be necessary during smear zone and groundwater delineation and characterization, although the PAH compounds generally have a more limited ability to dissolve and be transported with groundwater, so a limited sampling program is recommended.

Two different analytical methods have been used to measure VOC concentrations at the site: EPA Method 8021 and EPA Method 8260. Method 8021 measures only the four BTEX compounds, while Method 8260 measures a wide variety of VOCs, including chlorinated solvents and many additional petroleum related compounds. Method 8260 is generally regarded by the laboratory as a more accurate method for BTEX compounds because there is less likelihood of interference from other closely related VOCs, since these are also quantified. Comparison of these two methods at other sites indicates that BTEX concentrations by Method 8260 are generally slightly lower than by Method 8021. No samples collected at this site were analyzed by both methods for a site-specific comparison. Method 8260 is generally more expensive than Method 8021.

The analyte list for Method 8260 also includes naphthalene, which is also included in the Method 8270 SIMS analysis for PAHs. Naphthalene is one of the larger/heavier compounds measured by Method 8260 and the smallest/lightest measured by Method 8270. The laboratory also regards the Method 8260 analysis as more accurate than the Method 8270 analysis for naphthalene because of the procedure used to capture the contaminants from the sample is more efficient (collects more naphthalene) and is less subject to interference. At other sites, the naphthalene concentration has generally been lower by Method 8260 analysis than by Method 8270. Samples from the same smear zone location were analyzed by both methods at this site and the Method 8260 result was lower. The cost of the Method 8270 analysis is generally similar or higher than the Method 8260 analysis and varies more from lab to lab.

Since Method 8260 is generally believed to provide the most accurate data and covers both benzene (VOCs) and naphthalene (PAHs), this analytical method is recommended for future smear zone and groundwater delineation efforts. This is also expected to slightly reduce the cost associated with the overall sampling program by reducing the number of analytical methods and duplication of analyses for the same compounds. Two of these samples are recommended for analysis by Method 8270 to verify that naphthalene is a reasonable indicator of 1- and 2-methylnaphthalene concentrations. DRO analysis will also be required on each sample during delineation and characterization efforts.

The following table summarizes the contaminants of concern (COCs) and recommended analytical methods for future work at this site.

**Vadose Zone Soil**

| COC | Analytical Method | Notes |
|---|---|---|
| Benzene | Method 8260 | Includes other VOCs |

**Smear Zone and Groundwater**

| COC | Analytical Method | Notes |
|---|---|---|
| Benzene | Method 8260 | Includes other VOCs |
| Naphthalene | Method 8260 | Indicator of PAHs |
| DRO | AK 102 | |
| Other PAHs | Method 8270 SIMS | Limited to 2 samples per media (soil & water) to verify use of naphthalene as indicator |

## 6.4 Exposure Pathways

A preliminary conceptual site model (CSM) is included with this report as Appendix 4. Since the property is being developed as a long-term commercial/industrial facility, the CSM indicates the primary potential receptors are construction workers (until the facility is completed), future employees, and visitors to the site. The CSM discussion here has been separated into the contaminated media that remains in place at the site.

A small amount of contaminated soil remains in place at the limits of the corrective action excavation at location Ex1, approximately five feet below grade. Benzene is the only contaminant of concern at the location. The benzene contamination exceeds the migration to groundwater pathway and the saturated silt smear zone is already known to be contaminated based on observations during the excavation. The surface finish of the Ex1 location is expected to be a gravel parking area for heavy equipment, with some limited potential for additional migration of the benzene towards the groundwater. The benzene concentration does not exceed the inhalation or direct contact cleanup levels, so these pathways are not complete. The benzene concentration is below the residential screening level for vapor intrusion, so this pathway is also not complete.

Smear zone soil contamination at the site includes DRO, benzene, naphthalene, 1- and 2-methylnaphthalene at levels exceeding the migration to groundwater pathway. Actual dissolved concentrations of these contaminants have not been measured due to the low recharge rate of the silt layer. The regional aquifer that is believed to be present beneath the site has also not been tested. As with the benzene contamination in the vadose zone, the concentrations of most of these compounds are below the inhalation and direct contact cleanup levels. Contaminated soil in the top five feet has been removed in an effort to reduce the potential for direct contact with contaminated soil.

At this time, construction plans do not require additional excavation or work in this area. The primary exposure pathway from the remaining contamination is to workers doing assessment and corrective action related to this contamination. The potential for migration of these contaminants to outdoor air is also possible. Migration to indoor air is also and needs to be further evaluated in relation to recent guidance documents when the groundwater assessment has been completed.

Migration with the groundwater is also a significant concern as the regional groundwater is known to have a high hydraulic conductivity. The property and new facility will be connected to the Golden Heart Utilities public water system and exposure to persons at the site through contact with contaminated groundwater is not expected. A preliminary well search has indicated that no buildings within one-half mile to the west of the release use water wells for drinking. The use of groundwater and construction details of any groundwater wells that are in use in the area will be confirmed during the planned future assessment activities.

## 6.5 Management and Remediation Strategies

The site is managed through the ADEC Contaminated Sites Program (CS). The CS program offers some flexibility in long-term management of contaminated sites once the risks have been identified and evaluated.

### 6.5.1 Remaining Contaminated Vadose Zone Soil

At the completion of the corrective action effort, laboratory results indicate that a small amount of soil with a benzene concentration slightly above the AEC cleanup level remains in place at the Site. This limited area of contamination could probably be addressed through either additional corrective action excavation or additional risk assessment. A corrective action excavation in this area would probably be less than ten cubic yards and two more laboratory samples for benzene only would be necessary to show that clean limits have been reached. Additional risk assessment is anticipated to require three shallow soil borings and laboratory samples for benzene only.

Excavation equipment will be used during construction of the new facility and soil boring equipment will be present during the groundwater delineation and characterization, indicating that either of these options will be relatively easy. Excavation of the contaminated soil will reduce the need for long-term management of the vadose zone soil and leave the site with only groundwater contamination to address over time. Also, contaminated soil is expected to be landfarmed on the site, significantly reducing the cost per quantity of soil excavated. Based on these factors, excavation to remove the remaining vadose zone soil is recommended.

### 6.5.2 Stockpiled Soil

The corrective action excavation that was undertaken removed the majority of this contaminated soil. Approximately 800 to 1,000 cubic yards (1,200 to 1,500 tons) of contaminated soil remains stockpiled at the site awaiting remediation in a stockpile that is consistent with ADEC short-term stockpile guidelines (less than 180 days or through the winter). Fairbanks has two primary remediation alternatives for this type of material: thermal remediation and landfarming.

Thermal remediation can be done on-site or off-site. A fixed location for thermal remediation is available and is normally significantly cheaper than setting up a portable unit for contaminated soil in the greater Fairbanks area. The primary advantage of using thermal remediation is that it can be done in a short period of time (by the end of the 2009 summer season) and requires minimal planning and management. The thermal remediation facility provides a certificate of thermal remediation and disposes of the treated soil. The primary disadvantage of thermal remediation is cost, which is currently around $175.ton for 2009, not including transportation to the facility.

Landfarming of material in Fairbanks has also been used successfully at multiple sites. This process requires development of a work plan for review and approval by ADEC and regular maintenance of the remediation cell. This remediation method is normally less expensive, particularly if equipment is readily available for tilling the cells. Using this method also allows the material to remain on site, which may allow treatment to a site-specific alternative cleanup level instead of to ADEC Level A cleanup levels. The primary limitation to landfarming is the availability of space for the remediation cells and adequate access for tilling. This process also normally requires a multi-year commitment to the project, which may conflict with long-term development plans.

Landfarming is the recommended alternative for remediation of the current stockpile based on the availability of equipment and space, as well as the compatibility with the long-term development plans for the site. A remediation work plan for this project should also include development of site-specific remediation objectives that factor in the known spreading of contaminated soil on or near this property as part of a similar remediation project. This work plan should be developed and submitted as a standalone document so that it can be readily distributed to and understood by future managers and users of the property.

### 6.5.3 Groundwater

The current groundwater data is limited to one sample of silty soil from the top of the smear zone. Two different saturated zones are expected to be encountered at the site: a silt formation near the surface and a gravel formation at depth. The silt formation is expected to be saturated, but produce very little water and have limited potential for contaminant migration. The gravel formation is expected to be more representative of the regional aquifer and have greater potential to move contaminants off-site.

In order to more accurately identify and manage the risks associated with this site, characterization of both of the silt and gravel formations is recommended. Soil borings that extend through the silt and penetrate the top of the regional aquifer are recommended to evaluate the depth of the interface between these layers. Soil samples of the silt layer are expected to be necessary because the low-flow material is not expected to produce adequate water for a sample. Sampling of the water in this layer has also produced inconsistent results at other nearby sites that are probably not representative of the actual groundwater conditions. These samples will be more representative of the potential exposure pathways that involve migration of contaminants upward into outdoor and/or indoor air.

Soil samples from regional aquifer layer are expected to be unnecessary. This material is typically saturated and loose and soil samples are typically inconclusive. Groundwater samples from the regional aquifer layer are expected to be more

representative of the actual potential for contaminant migration off the site. A combination of small diameter wells and temporary groundwater sampling points is recommended to provide a good snapshot of the current conditions as well as provide the basis for a long-term monitoring program.

Recommended sample locations are shown in Figure 5. This includes soil borings, temporary sampling points, and permanent well installations. These locations were based on field observations that contamination was not observed in the building footprint excavation to the east and the general west-northwest gradient that is observed in the regional aquifer and at other contaminated sites nearby. The objective of this sampling event is to find clean soil and groundwater around the edges of the contamination. Figure 5 also includes several additional points that may be necessary in the event that field observations indicate that contamination is significantly different than expected.

Use of direct push methods, such as the Geoprobe MacroCore system, is recommended to minimize the development of investigation derived wastes (IDW) as well as provide the most reliable recovery rates in this type of saturated soils. These systems also provide a high level of flexibility in the field as tools can be changed quickly to evaluate different media. Soil samples will be field screened using a PID to evaluate relative levels of contamination. Several field parameters, including dissolved oxygen, pH, ORP, and conductivity, will be measured during groundwater purging. The recommended analytical program for this delineation and characterization effort is for DRO and VOC analyses. Two soil samples and one groundwater sample should also be analyzed for PAHs. This work should be completed during the summer of 2009 and the specific dates will be selected based on the available of direct-push subcontractors and to minimize impacts to the construction project.

The data collected during this recommended characterization effort will be used to evaluate the risks associated with the contamination in the saturated zones and the potential effectiveness of different remediation strategies. Based on the current field observations, active groundwater remediation may not be necessary or cost effective. In this case, the data will be used to develop a long-term management strategy for the property. This section of this report is intended as a work plan for the groundwater characterization effort. This should be submitted to ADEC for review to expedite the review process and provide maximum flexibility for scheduling during the 2009 season.

## 7.0 CONCLUSIONS AND RECOMMENDATIONS

***NORTECH*** has completed building demolition and initial site characterization at 801 Van Horn Drive in Fairbanks, Alaska. The site is currently being developed by NC Machinery Company as a sales and maintenance facility for heavy equipment. The site was originally developed as part the Tennessee Miller Subdivision and was used by a gravel mining and trucking operation, primarily during construction of the Trans Alaska Pipeline. Prior to the purchase and development by NC Machinery, most of the original buildings had been removed and environmental cleanup had been undertaken on several other parcels within the Tennessee Miller Subdivision, after which the area had been subdivided for redevelopment.

NC Machinery completed Phase I and Phase II investigations as part of the acquisition and development of the site. The Phase I indicated that DRO contaminated soil had been landspread nearby as part of previous remediation efforts on nearby parcels that were part of the original Tennessee Miller Subdivision. The Phase II efforts indicated that a small amount of DRO contamination was present at a location well outside the planned building footprint. Together, these investigations indicated that other small pockets of contamination may be encountered at the site during development activities.

This report documents the identification and handling of two areas of contamination at the site: a small area near a former concrete slab and a larger area at the western edge of the planned building. These two areas are discussed in the following sections.

### 7.1 Former Slab Area

***NORTECH*** completed field screening of contamination near a former concrete slab at the site. The source of the contamination was not identified, but is believed to have been related to activity at the former building. Based on the field efforts completed at the former slab, ***NORTECH*** has developed the following conclusions and recommendations related to contamination in this area:

- Elevated field screening results up to 50 ppm were observed in this area
  - No visibly stained soil was observed
  - Olfactory observations indicate that the contamination was consistent with diesel fuel
- Approximately 20 cubic yards of contaminated soil were segregated from the shallow excavation and associated stockpile
  - Field screening was used to direct the excavation
  - PID readings at the limits of excavation were below 5 ppm
  - No contaminated soil was left at the limits of the excavation

    - Mass excavation of the area continued after the contaminated soil was segregated
- The quantity of contaminated soil was inadvertently increased due to the method of excavation
    - Site excavation was being completed with a bulldozer because no known concerns were documented in the Phase I or Phase II reports
    - The equipment operator stopped as soon as the environmental concern was suspected
    - The original volume of contaminated soil was estimated at less than five cubic yards
- This material was placed in a short term stockpile pending remediation
    - Additional diesel contaminated material (discussed below) has been added to the stockpile
    - On site landfarming appears to be a viable remediation option for this material

## 7.2 Western Edge of New Building

The second area of suspected contamination was identified during slope stabilization at the western edge of the new building limits. The contamination in this area appeared to be more extensive than the former slab area and also appeared to impact groundwater. The field activities completed to date were intended as a limited corrective action to reduce the likelihood of having to excavate additional soil within the structural prism of the planned building. Based on the data collected during the activities at this location, ***NORTECH*** has developed the following conclusions and recommendations related to contamination at the western edge of the planned building:

**Sources and Source Control**

- Laboratory results indicate the contamination is primarily weathered diesel fuel or heating oil
- This area of contamination is not directly linked to the contamination at the former slab area
- Aerial photographs from a period of operation (1979) were reviewed
    - Vehicles and equipment are stored all around the site
    - No fuel canopy, fuel island, large stained area, or other obvious source of contamination is visible
- Diesel contaminated soil was spread across a portion of the former Tract F as part of the ADEC approved remediation effort
    - The exact location of this land spreading activity on Tract F has not been identified
    - This was approved for relatively thin surface layers of low level contaminated soils only

    - The contamination observed is not in a thin layer or at the ground surface
    - This contamination is not related to the former land spreading activity
- No drainage, fuel storage, or other potential source structure was observed during excavation in this area
- The source, although not identified, is no longer ongoing
- Additional source identification is not considered necessary or recommended

**Vadose Zone Soil Contamination**

- A total of 800 to 1,000 cubic yards of contaminated soil were excavated from the vadose zone (soil above the top of the saturated smear zone)
- Field screening and laboratory sampling indicate that most vadose zone soil contamination has been removed
    - Five sidewall locations met the ADEC cleanup levels for petroleum compounds
    - The benzene concentration is slightly above the ADEC cleanup level at the one other sidewall location
        - Migration to groundwater is the only potential exposure pathway that is complete for this limited quantity of soil
        - Excavation is recommended to remove the limited amount of benzene contaminated soil (about 10 yards) that remains
        - Laboratory closure sampling of this small excavation should be limited to benzene
        - The limited amount of contaminated soil excavated should be placed in the existing stockpile
- The contaminated soil that has been excavated has been placed in a stockpile while reviewing remediation options

**Groundwater and Smear Zone Contamination and Physical Characteristics**

- A soil sample indicates petroleum contaminants are present in the saturated silt that is found at the top of the groundwater smear zone
    - A groundwater sample could not be collected in the saturated silt due to the low hydraulic conductivity of the silt
    - The saturated silt layer extends to at least 14 feet below the ground surface in a test pit within the building footprint
    - The saturated silt layer does not represent the high hydraulic conductivity regional aquifer that underlies the area
    - Off-site migration of contaminants through the saturated silt is unlikely
- Additional assessment of the aquifer materials and potential contaminant migration within the groundwater is recommended
    - Existing geotechnical borings should be reviewed to determine the depth of the silt layer and to the regional gravel aquifer across the entire site

- Soil borings should be advanced and field screened at several potential groundwater sample locations to verify the depth of the silt layer
- Groundwater sampling efforts should be focused on the gravel aquifer
- Additional soil samples may be necessary to assess the contamination in the silt layer

**Smear Zone and Groundwater Contaminants of Concern and Exposure Pathways**

- Laboratory analysis of a saturated silt sample indicates that the smear zone contamination is consistent with weathered diesel fuel and/or heating oil
- Specific contaminants of concern that exceed the ADEC Cleanup levels in the smear zone soil are:
  - Diesel range organics (DRO)
  - Benzene
  - Naphthalene
  - 1-Methylnaphthalene
  - 2- Methylnaphthalene
- No groundwater samples have been collected at this time
- Recommended smear zone soil and groundwater laboratory analyses for characterization and delineation are:
  - AK102 for DRO
  - 8260 for VOCs, including benzene and naphthalene
  - 8270 for PAHs, two samples to verify naphthalene is a reasonable indicator for 1-Methylnaphthalene and 2- Methylnaphthalene
- A preliminary conceptual site model (CSM) has identified the following potential exposure pathways related to the smear zone contamination:
  - The primary exposure pathway from the smear zone contamination is to workers performing characterization and corrective action
  - Migration from the smear zone to outdoor air is also a potential exposure pathway, but is generally not a significant concern
  - Migration from the smear zone to indoor air is also a potential exposure pathway
  - The data from the recommended characterization activities will be used to refine the CSM

**Stockpile Management and Remediation Strategies**

- The stockpiled volume is estimated at 800 to 1,000 cubic yards (1,200 to 1,500 tons)
- The existing stockpile was constructed to ADEC short-term stockpile specifications

- Thermal remediation and landfarming are the two primary treatment methods in Fairbanks
    - Thermal remediation is more expedient and typically more expensive
        - Remediation is performed at a fixed, off-site facility
        - The most stringent ADEC cleanup levels will be achieved
        - Remediation could be completed in 2009
        - Management costs are minimal
        - Costs for 2009 are around $175/ton, not including transportation
    - Landfarming requires adequate space and a multi-year management plan
        - Remediation is expected to take several seasons
        - Landfarm work plans must be approved by ADEC
        - Site specific cleanup levels may be possible if the material remains on the site
        - Costs are generally limited to fertilizer, equipment, and labor for tilling the landfarm cells
- Landfarming is the recommended treatment method for the following reasons:
    - The material is relatively coarse (sands and gravels) and is expected to be treated relatively quickly through landfarming
    - The site plans indicate adequate unused space for a landfarm
    - Equipment and labor will be readily available at the facility
    - NC Machinery is committed to the site as a long-term owner
- The landfarm work plan development and execution is recommended for 2009 because:
    - The existing stockpile liner was intended for short-term use until 2009 and may require replacement prior to the 2010 construction season
    - Remediation may be complete before the facility opens following construction in 2010/2011

**Recommended Work Plan for Groundwater Characterization**

- Groundwater characterization is recommended during the 2009 field season
- Two saturated soil formations are expected at the site:
    - The saturated silt encountered in 2008 that is known to be contaminated
    - The regional gravel aquifer that was not encountered in 2008
- Soil borings are recommended to determine the depth of the silt formation
    - The silt is very low flow and water sampling is not expected to be successful in this layer
    - Characterization of this formation should be done from soil samples collected using a continuous sampling method
    - Direct push methods are recommended to minimize the development of investigation derived wastes (IDW)

- Screened wells and/or temporary groundwater sampling points are recommended to evaluate the gravel aquifer
    - This formation should have adequate recharge for water sampling
    - Soil samples are expected to have poor recovery
    - The combination of wells and temporary points will provide:
        - A high density snapshot for current delineation
        - Adequate sampling points for long-term monitoring
    - Direct push methods are recommended to minimize IDW
- Section 6.5.3 and Figure 5 are expected to be adequate detailed for submittal to ADEC as a groundwater characterization work plan

## 8.0 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.

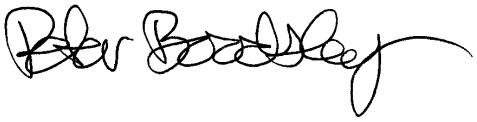
The report is a record of observations and measurements made on the subject site as described. The data should be considered representative only of the time the site investigation was completed. No other warranty or presentation, either expressed or implied, is included or intended. This report is prepared for the exclusive use of the NC Machinery Company. 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.

## 9.0 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.

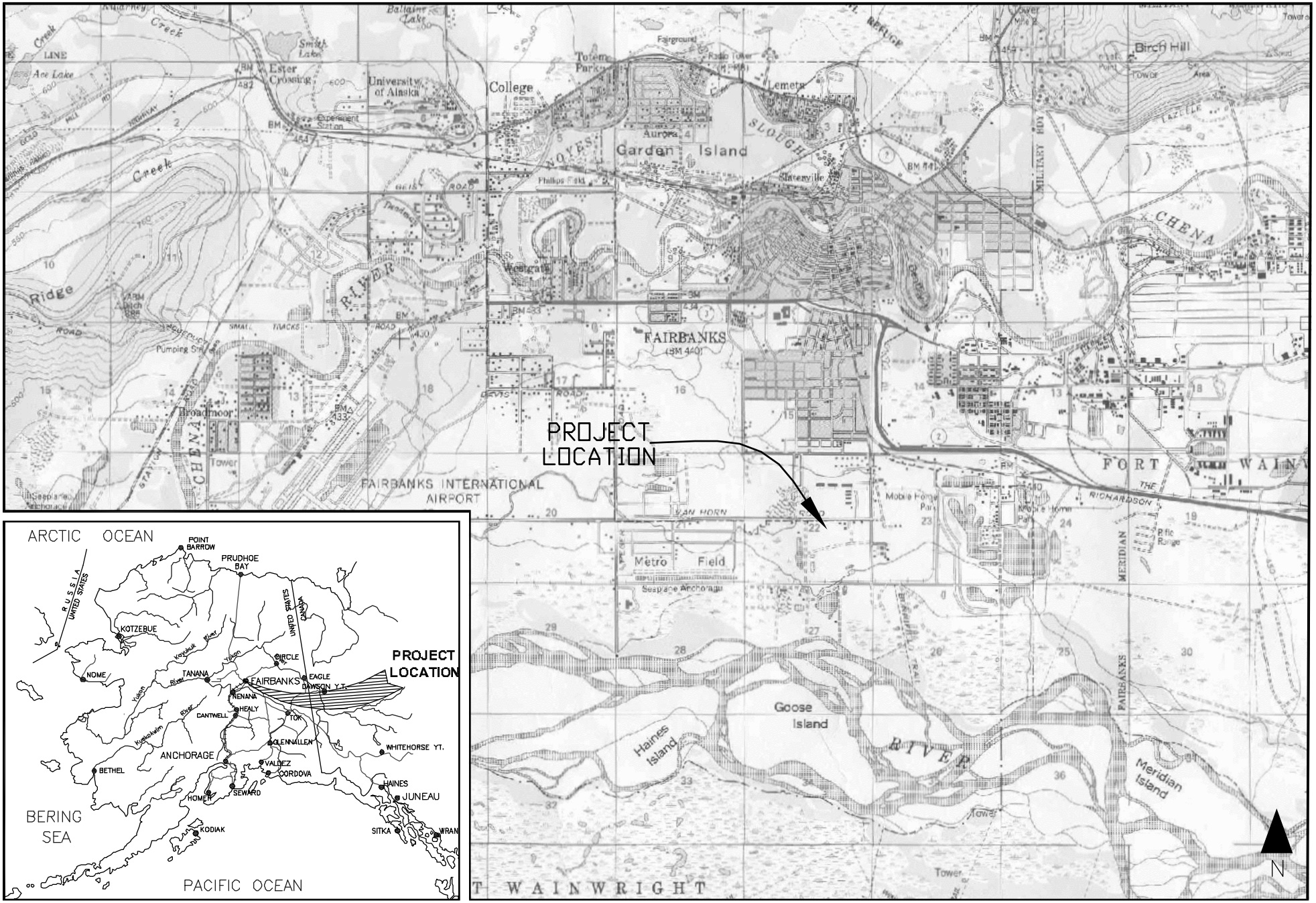
Ronald J. Pratt
Environmental Scientist

**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

# Appendix 1

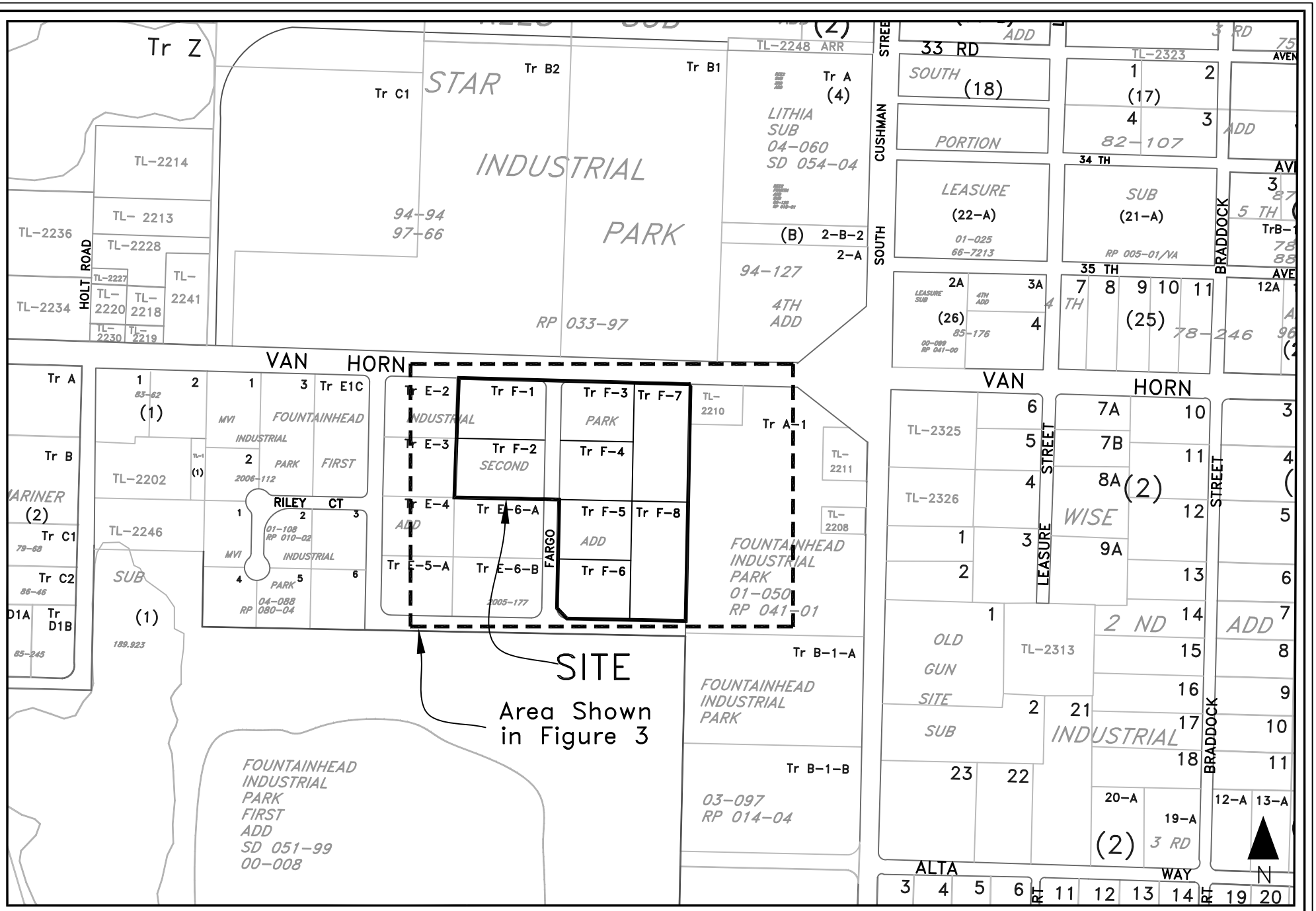



NORTECH
ENVIRONMENTAL ENGINEERING HEALTH & SAFETY
2400 College Road, Fairbanks, Alaska 99709 Ph: 907-452-5688
3105 Lakeshore Dr. Anch, Alaska 99517 Ph: 907-222-2445
119 Seward St. #10, Juneau, Alaska 99801 Ph: 907-586-6813

Location Map
NC Machinery - Van Horn Road
Fairbanks, Alaska

| | |
|---|---|
| DATE: 04/15/09 | SCALE: 1" = 1mi. |
| DESIGN: PLB | PROJECT: 08-1082 |
| DRAWN: PLB | DWG: 081082c(01) |

FIGURE 1





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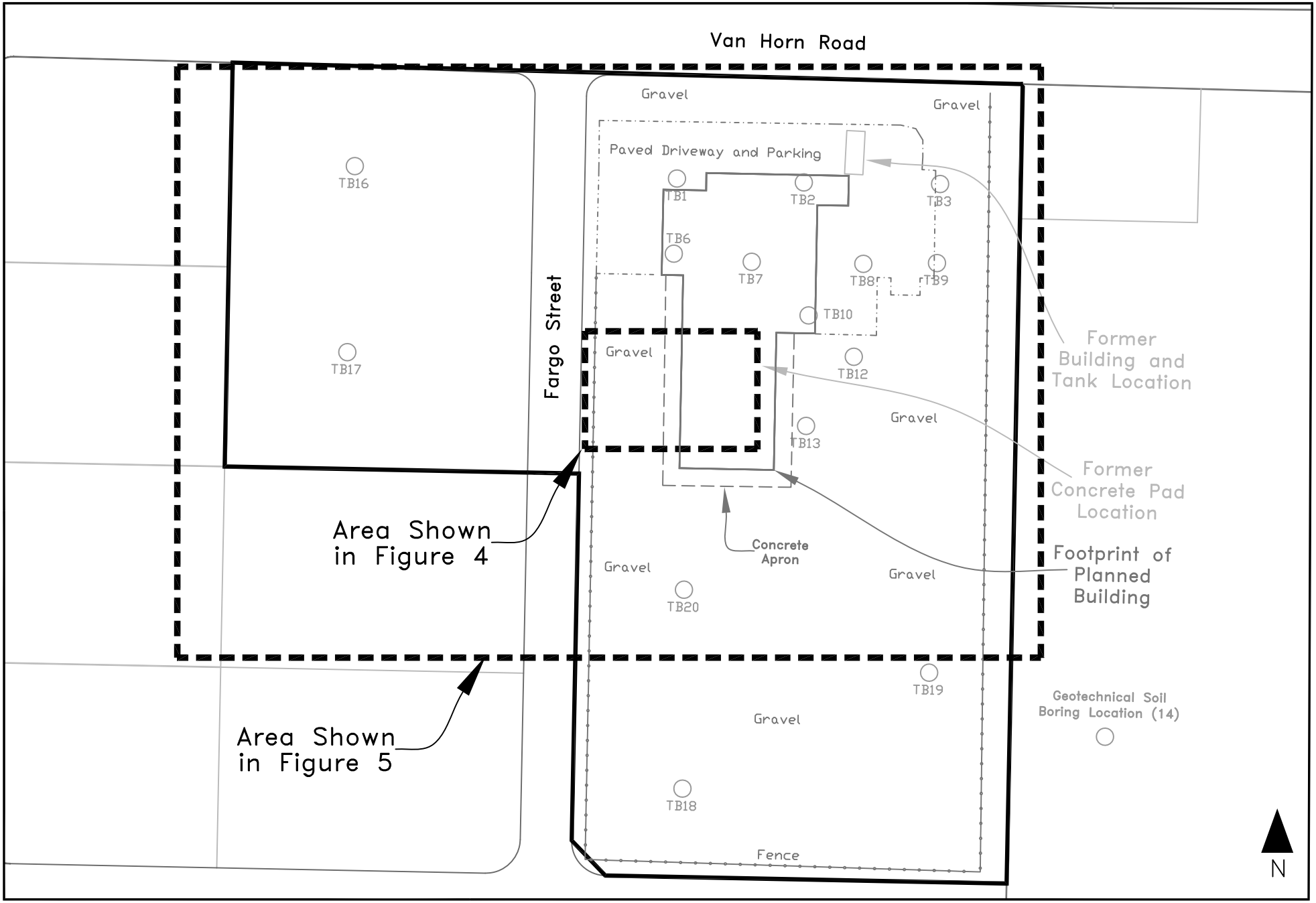
Vicinity Map
NC Machinery - Van Horn Road
Fairbanks, Alaska

| | |
|---|---|
| DATE: 04/15/09 | SCALE: 1" = 500' |
| DESIGN: PLB | PROJECT: 08-1082 |
| DRAWN: PLB | DWG: 081082c(02) |

FIGURE 2

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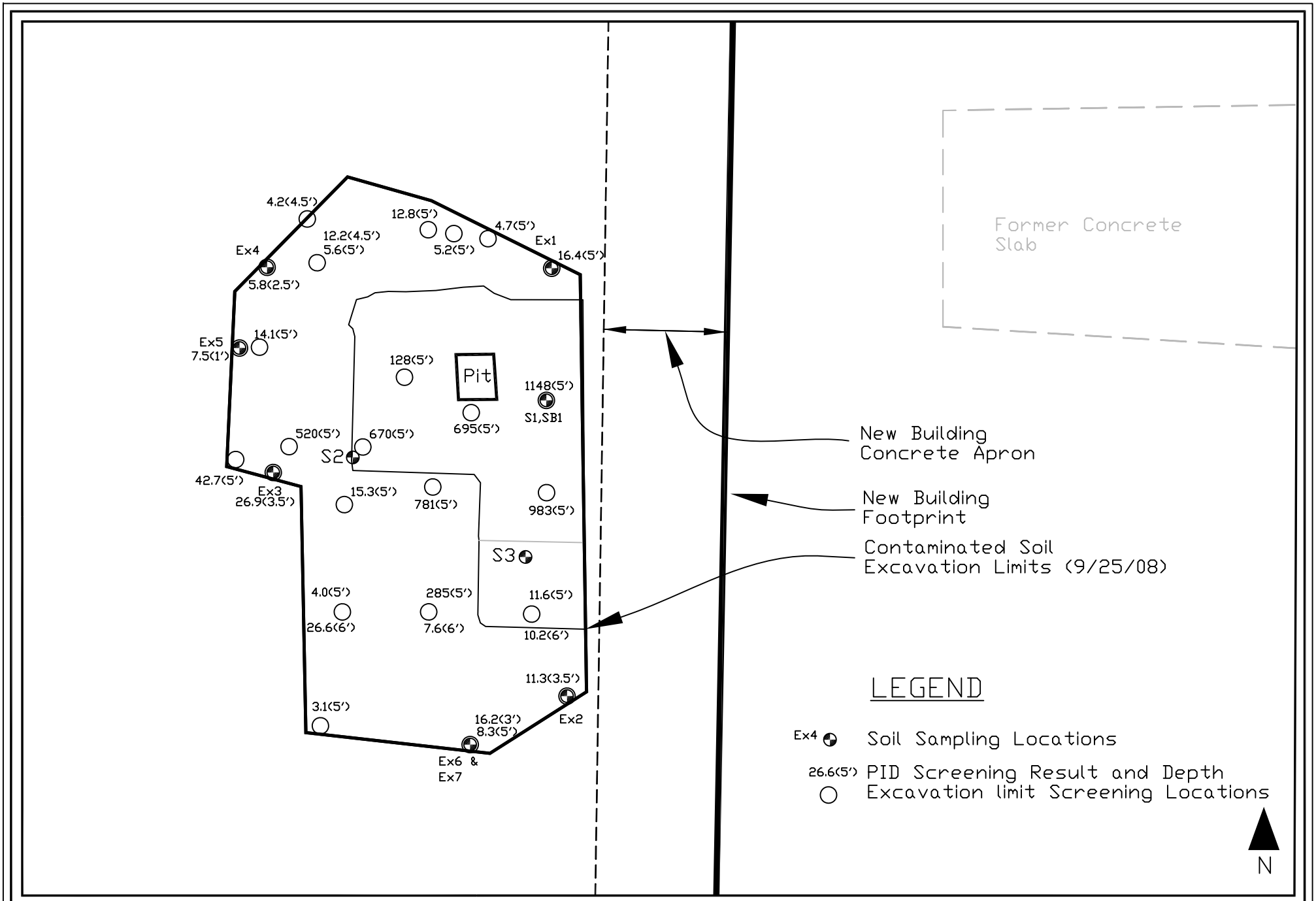
119 Seward St. #10, Juneau, Alaska 99801 Ph: 907-586-6813

Site Map with Former and Planned Structures
NC Machinery - Van Horn Road
Fairbanks, Alaska

| | |
|---|---|
| DATE: 04/15/09 | SCALE: 1" = 150' |
| DESIGN: PLB | PROJECT: 08-1082 |
| DRAWN: PLB | DWG: 081082c(03) |

FIGURE 3




NORTECH
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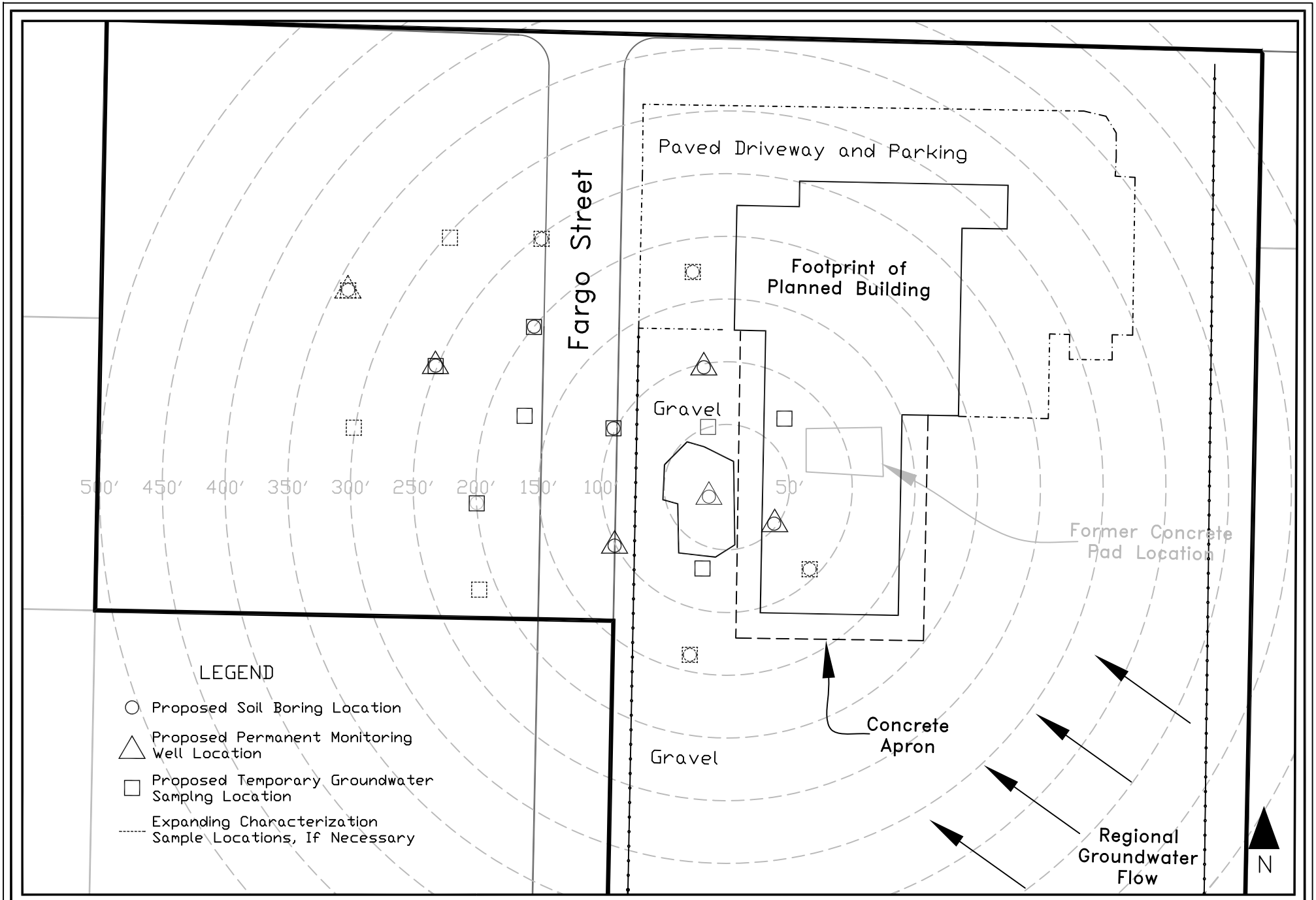
3105 Lakeshore Dr. Anch, Alaska 99517 Ph: 907-222-2445
119 Seward St. #10, Juneau, Alaska 99801 Ph: 907-586-6813

Excavation Area and Sample Locations
NC Machinery - Van Horn Road
Fairbanks, Alaska

| | |
|---|---|
| DATE: 04/15/09 | SCALE: 1" = 20' |
| DESIGN: PLB | PROJECT: 08-1082 |
| DRAWN: PLB | DWG: 081082c(04) |

FIGURE
4




NORTECH
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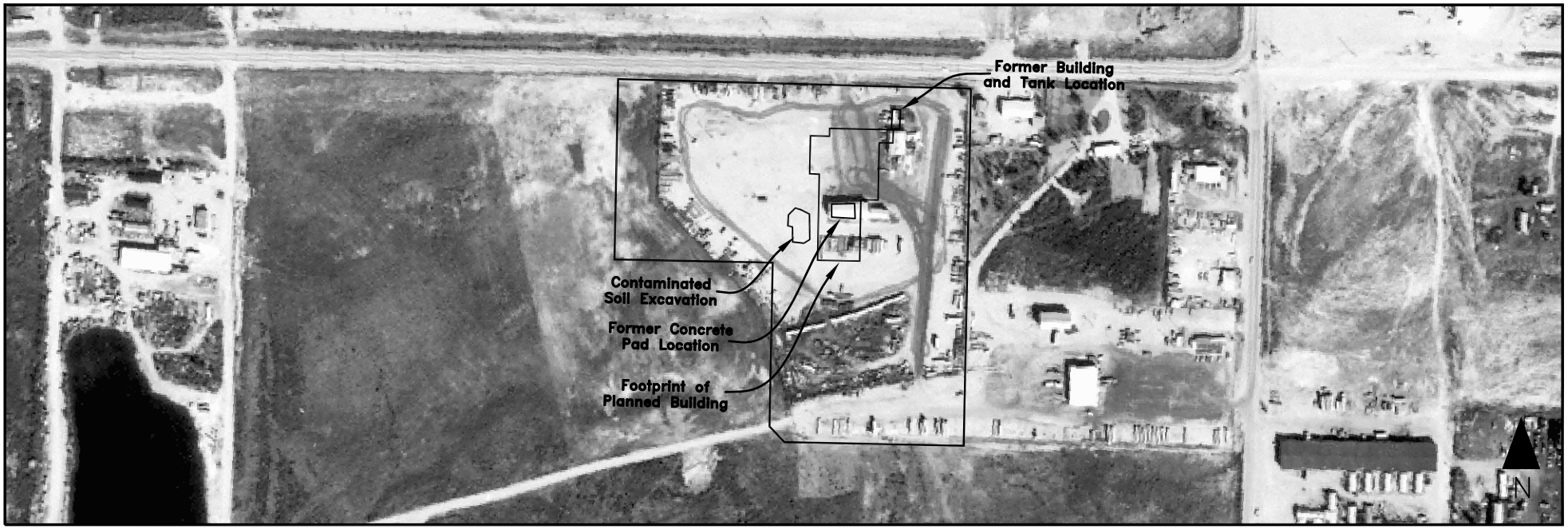
3105 Lakeshore Dr. Anch, Alaska 99517 Ph: 907-222-2445
119 Seward St. #10, Juneau, Alaska 99801 Ph: 907-586-6813

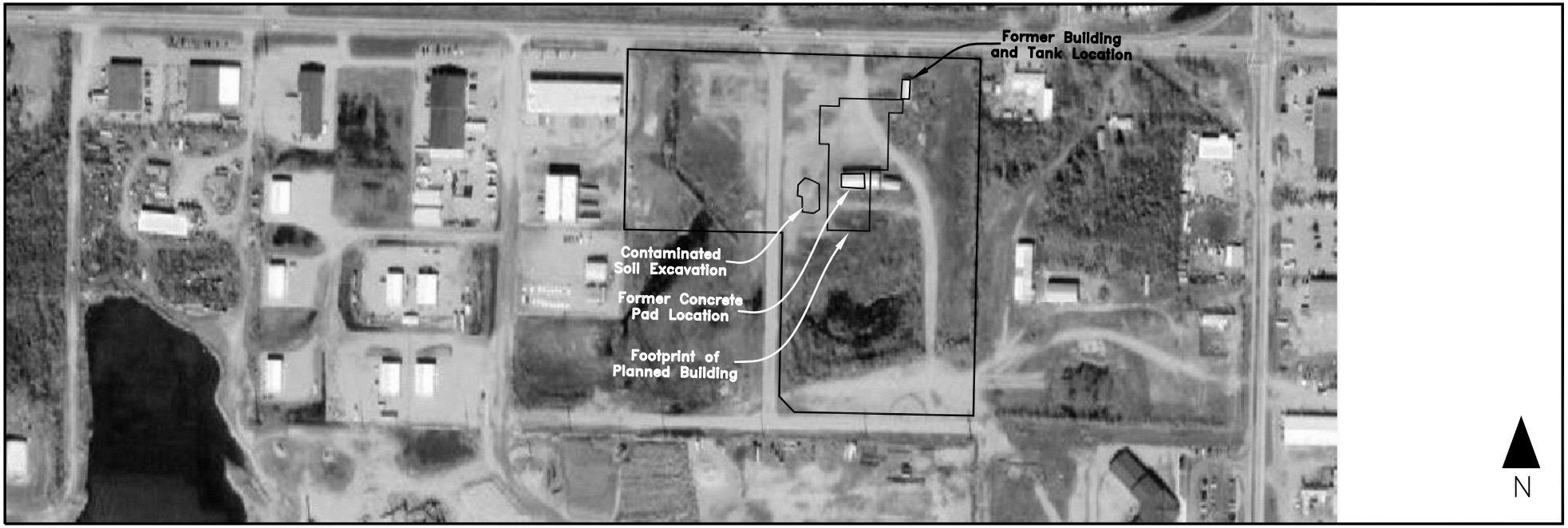
Proposed Groundwater Charaterization Samples
NC Machinery - Van Horn Road
Fairbanks, Alaska

| | |
|---|---|
| DATE: 04/15/09 | SCALE: 1" = 100' |
| DESIGN: PLB | PROJECT: 08-1082 |
| DRAWN: PLB | DWG: 081082c(05) |

FIGURE
5




Aerial Photographs with Former and Planned Structures and Contaminated Soil Excavation: 1979 (Top) and 2006 (Bottom)




NORTECH
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3105 Lakeshore Dr. Anch, Alaska 99517 Ph: 907-222-2445
119 Seward St. #10, Juneau, Alaska 99801 Ph: 907-586-6813

1979 and 2006 Aerial Photographs
NC Machinery - Van Horn Road
Fairbanks, Alaska

| | |
|---|---|
| DATE: 04/15/09 | SCALE: 1" = 400' |
| DESIGN: PLB | PROJECT: 08-1082 |
| DRAWN: PLB | DWG: 081082c(06) |

FIGURE
6

# Appendix 2

**Table 1**
**Soil Sample Analytical Results - Detected Analytes**

| Sample Event Type | ADEC | Initial Sampling (09/15/08) | | | Confirmation Sampling (09/26/08) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | Method 2 | S1 | S2 | S3 | Ex1 | Ex2 | Ex3 | Ex4 | Ex5 | Ex6 | Ex7* |
| Depth (feet below grade) | Cleanup | 5 | 2 | 2.5 | 5 | 3.5 | 3.5 | 2.5 | 1 | 3 | 3 |
| Material | Levels | silt | gravel | sand | silt | sand | sand | gravel | gravel | sand | sand |
| PID Result (ppm) | (2008) | 1148 | 587 | 677 | 16.4 | 11.3 | 26.9 | 5.8 | 7.5 | 16.2 | 16.2 |
| **Petroleum Fractions (Method AK 102, & 103)** | | | | | | | | | | | |
| DRO | 250 | **16,100** | **18,160** | **1740** | 109.0U | 21.8U | 21.7U | 22.6U | 22.8U | 23.4U | 24.0U |
| RRO | 10,800 | 647U | 494U | 579U | | | | | | | |
| **Volatile Organic Compounds (VOCs, Method 8260 - Initial, Method 8021 - Confirmation)** | | | | | | | | | | | |
| Benzene | 0.025 | **0.231** | 0.00562U | 0.00763U | **0.0341** | 0.0165U | 0.0181U | 0.0123U | 0.0147U | 0.0183U | 0.0174U |
| Toluene | 5.4 | 0.651 | 0.0281U | 0.0368U | 0.125U | 0.0658U | 0.0725U | 0.0494U | 0.0590U | 0.0733U | 0.0695U |
| Ethylbenzene | 6.9 | 1 | 0.0281U | 0.0585 | 0.172 | 0.0658U | 0.0725U | 0.0494U | 0.0590U | 0.0733U | 0.0695U |
| Xylenes (total) | 63 | 6.24 | 0.0843U | 0.425 | 0.125U | 0.0658U | 0.0725U | 0.0494U | 0.0590U | 0.0733U | 0.0695U |
| 1,3,5-Trimethylbenzene | 23 | 1.97 | 4.02 | 1.19 | | | | | | | |
| 1,2,4-Trimethylbenzene | 23 | 6.02 | 2.05 | 2.41 | | | | | | | |
| n-Butylbenzene | 15 | 1.52 | 1.02 | 0.78 | | | | | | | |
| sec-Butylbenzene | 12 | 1.22 | 0.213 | 1.02 | | | | | | | |
| tert-Butylbenzene | 12 | 0.0771 | 0.119 | 0.0614 | | | | | | | |
| Napthalene | 20 | 12.6 | 12 | 1.66 | | | | | | | |
| Isopropylbenzene | 51 | 0.767 | 0.0281U | 0.198 | | | | | | | |
| n-Propylbenzene | 15 | 1.11 | 0.0281U | 0.213 | | | | | | | |
| p-Isopropyltoluene | * | 0.706 | 0.465 | 0.614 | | | | | | | |
| **Polycyclic Aromatic Hyrdocarbons (Method 8270 SIMS)** | | | | | | | | | | | |
| Phenanthrene | 3000 | 3.36 | | | | | | | | | |
| Flourene | 220 | 4.14 | | | | | | | | | |
| Napthalene | 20 | **27.6** | | | | | | | | | |
| 2-Methylnaphthalene | 6.1 | **102.0** | | | | | | | | | |
| 1-Methylnaphthalene | 6.2 | **84.4** | | | | | | | | | |

***Notes :***

* - Sample Ex7 is a Field Duplicate of Ex6

| | |
|---|---|
| U | Analyte not detected at the listed PQL |
| Shade | Detected/estimated concentration below the ADEC Method 2 Cleanup level |
| **Bold** | Detected/estimated concentration above the ADEC Method 2 Cleanup level |

# Appendix 3

# Appendix 3 - Site Photographs
# NC Machinery Van Horn Rd - Initial Site Characterization

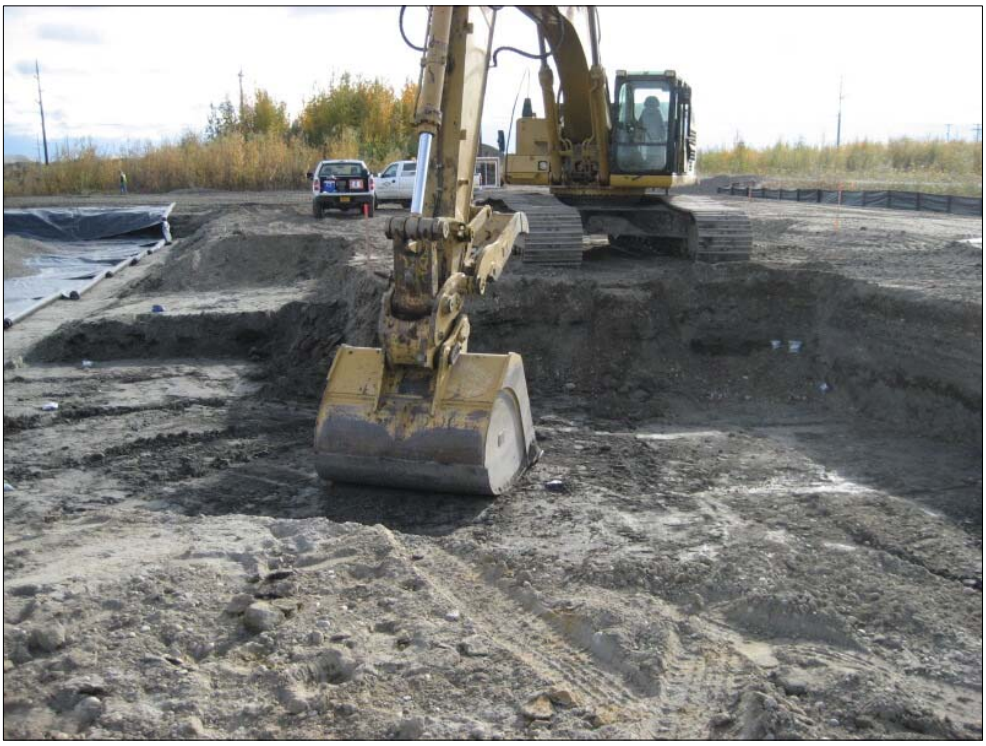

Photo 1 - Looking south during initial field screening of contaminated soil excavation area (9-11-08)

Photo 2 - West sidewall soil profile 9-15-08, showing sandy gravel imported fill overlying native alluvial sand, peaty/organic layer, and silty sand becoming clayey silt at bottom

**Appendix 3 - Site Photographs**
**NC Machinery Van Horn Rd - Initial Site Characterization**

Photo 3 - Soil characterization sampling on 9-15-08 showing locations S3 (foreground) and S1 (background)

Photo 4 - Looking west at excavation of trenches 1 and 2 (9-24-08) to define limits of contamination

**Appendix 3 - Site Photographs**
**NC Machinery Van Horn Rd - Initial Site Characterization**

Photo 5 - Looking northwest at corrective action excavation 9-25-08, with reddish sand marking clean limits of sidewall with no POL odors or staining observed

Photo 6 - Looking west at corrective action excavation 9-25-08, with sand (right) and gray sand/silt (left) with observed POL staining and odors prior to excavation

**Appendix 3 - Site Photographs**
**NC Machinery Van Horn Rd - Initial Site Characterization**

Photo 7 - Exploratory pit into groundwater through gray clayey silt at bottom of primary excavation on 9-25-08

Photo 8 - Field screening of bottom southern excavation limits

**Appendix 3 - Site Photographs**
**NC Machinery Van Horn Rd - Initial Site Characterization**

Photo 9 - Final limits of corrective action excavation looking south 9-26-08, exploratory pit to groundwater at left

Photo 10 - Final limits of corrective action excavation looking west 9-26-08, with exploratory pit to groundwater at right

# Appendix 4

# HUMAN HEALTH CONCEPTUAL SITE MODEL

*Site:* NC Machinery - 801 Van Horn Road

*Completed By:* Peter Beardsley

*Date Completed:* NOvember 2008

***Follow the directions below. Do not consider engineering or land use controls when describing pathways.***

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

**(2)**
*For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Briefly list other mechanisms or reference the report for details.*

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

**(4)**
*Check exposure pathways that are complete or need further evaluation. The pathways identified must agree with Sections 2 and 3 of the CSM Scoping Form.*

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

| Media | Transport Mechanisms | Exposure Media | Exposure Pathways | Current & Future Receptors: Residents (adults or children) | Commercial or industrial workers | Site visitors, trespassers, or recreational users | Construction workers | Farmers or subsistence harvesters | Subsistence consumers | Other |
|---|---|---|---|---|---|---|---|---|---|---|
| ☑ Surface Soil (0-2 ft bgs) | ☑ Direct release to surface soil → *check soil* | ☑ soil | ☑ Incidental Soil Ingestion | | F | F | F | | | |
| | ☑ Migration or leaching to subsurface → *check soil* | | ☐ Dermal Absorption of Contaminants from Soil | | | | | | | |
| | ☑ Migration or leaching to groundwater → *check groundwater* | | | | | | | | | |
| | ☑ Volatilization → *check air* | | | | | | | | | |
| | ☐ Runoff or erosion → *check surface water* | | | | | | | | | |
| | ☐ Uptake by plants or animals → *check biota* | | | | | | | | | |
| | ☐ Other (*list*): | | | | | | | | | |
| ☑ Subsurface Soil (2-15 ft bgs) | ☑ Direct release to subsurface soil → *check soil* | ☑ groundwater | ☑ Ingestion of Groundwater | | F | F | F | | | |
| | ☑ *Migration to groundwater* → *check groundwater* | | ☐ Dermal Absorption of Contaminants in Groundwater | | | | | | | |
| | ☑ *Volatilization* → *check air* | | ☐ Inhalation of Volatile Compounds in Tap Water | | | | | | | |
| | ☐ *Other (list):* | | | | | | | | | |
| ☑ Ground-water | ☑ Direct release to groundwater → *check groundwater* | ☑ air | ☑ Inhalation of Outdoor Air | | F | F | F | | | |
| | ☐ *Volatilization* → *check air* | | ☑ Inhalation of Indoor Air | | F | F | F | | | |
| | ☐ *Flow to surface water body* → *check surface water* | | ☐ Inhalation of Fugitive Dust | | | | | | | |
| | ☐ *Flow to sediment* → *check sediment* | | | | | | | | | |
| | ☐ *Uptake by plants or animals* → *check biota* | | | | | | | | | |
| | ☐ *Other (list):* | | | | | | | | | |
| ☐ Surface Water | ☐ Direct release to surface water → *check surface water* | ☐ surface water | ☐ Ingestion of Surface Water | | | | | | | |
| | ☐ *Volatilization* → *check air* | | ☐ Dermal Absorption of Contaminants in Surface Water | | | | | | | |
| | ☐ *Sedimentation* → *check sediment* | | ☐ Inhalation of Volatile Compounds in Tap Water | | | | | | | |
| | ☐ *Uptake by plants or animals* → *check biota* | | | | | | | | | |
| | ☐ *Other (list):* | | | | | | | | | |
| ☐ Sediment | ☐ Direct release to sediment → *check sediment* | ☐ sediment | ☐ Direct Contact with Sediment | | | | | | | |
| | ☐ *Resuspension, runoff, or erosion* → *check surface water* | | | | | | | | | |
| | ☐ *Uptake by plants or animals* → *check biota* | ☐ biota | ☐ Ingestion of Wild Foods | | | | | | | |
| | ☐ *Other (list):* | | | | | | | | | |

Revised 3/21/06

# Human Health Conceptual Site Model
# Scoping Form

**Site Name:** NC Machinery - 801 Van Horn Road

**File Number:**

**Completed by:** Peter Beardsley

**Introduction**

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

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

## 1. *General Information:*

**Sources** *(check potential sources at the site)*

- ☐ USTs
- ☐ ASTs
- ☐ Dispensers/fuel loading racks
- ☐ Drums
- ☐ Vehicles
- ☐ Landfills
- ☐ Transformers
- ☐ Other: Not Known

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

- ☐ Spills
- ☐ Leaks
- ☐ Direct discharge
- ☐ Burning
- ☐ Other: Not Known

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

- ☑ Surface soil (0-2 feet bgs*)
- ☑ Subsurface Soil (>2 feet bgs)
- ☐ Air
- ☑ Groundwater
- ☐ Surface water
- ☐ Other:

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

- ☐ Residents (adult or child)
- ☑ Commercial or industrial worker
- ☑ Construction worker
- ☐ Subsistence harvester (i.e., gathers wild foods)
- ☐ Subsistence consumer (i.e., eats wild foods)
- ☑ Site visitor
- ☑ Trespasser
- ☐ Recreational user
- ☐ Farmer
- ☐ Other:

* bgs – below ground surface

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

### a) Direct Contact –

#### 1 Incidental Soil Ingestion

Is soil contaminated anywhere between 0 and 15 feet bgs? ☑

Do people use the site or is there a chance they will use the site in the future? ☑

*If both boxes are checked, label this pathway complete:* complete

#### 2 Dermal Absorption of Contaminants from Soil

Is soil contaminated anywhere between 0 and 15 feet bgs? ☑

Do people use the site or is there a chance they will use the site in the future? ☑

Can the soil contaminants permeate the skin? (Contaminants listed below, or within the groups listed below, should be evaluated for dermal absorption). ☐

| | |
|---|---|
| Arsenic | Lindane |
| Cadmium | PAHs |
| Chlordane | Pentachlorophenol |
| 2,4-dichlorophenoxyacetic acid | PCBs |
| Dioxins | SVOCs |
| DDT | |

*If all of the boxes are checked, label this pathway complete:* No

### b) Ingestion –

#### 1 Ingestion of Groundwater

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

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

*If both the boxes are checked, label this pathway complete:* complete

### 2 Ingestion of Surface Water

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

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

*If both boxes are checked, label this pathway complete:* No

### 3 Ingestion of Wild Foods

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

Do the site contaminants have the potential to bioaccumulate (*see* Appendix A)? ☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. the top 6 feet of soil, in groundwater that **could be** connected to surface water, etc.) ☐

*If all of the boxes are checked, label this pathway complete:* No

## c) Inhalation

### 1 Inhalation of Outdoor Air

Is soil contaminated anywhere between 0 and 15 feet bgs? ☑

Do people use the site or is there a chance they will use the site in the future? ☑

Are the contaminants in soil volatile (*See Appendix B*)? ☑

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

### 2 Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be placed on the site in an area that could be affected by contaminant vapors? (i.e., within 100 feet, horizontally or vertically, of the contaminated soil or groundwater, <u>or</u> subject to "preferential pathways" that promote easy airflow, like utility conduits or rock fractures) ☑

Are volatile compounds present in soil or groundwater (*See Appendix C*)? ☑

*If both boxes are checked, label this pathway complete:* complete

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

**Dermal Exposure to Contaminants in Groundwater and Surface Water**

Exposure from this pathway may need to be assessed only in cases where DEC water-quality or drinking-water standards are not being applied as cleanup levels. Examples of conditions that may warrant further investigation include:

- Climate permits recreational use of waters for swimming,
- Climate permits exposure to groundwater during activities, such as construction, without protective clothing, or
- Groundwater or surface water is used for household purposes.

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

Comments:

| |
|---|
| NA |

**Inhalation of Volatile Compounds in Household Water**

Exposure from this pathway may need to be assessed only in cases where DEC water-quality or drinking-water standards are not being applied as cleanup levels. Examples of conditions that may warrant further investigation include:

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

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

Comments:

| |
|---|
| NA |

**Inhalation of Fugitive Dust**

Generally DEC soil ingestion cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway, although this is not true in the case of chromium. Examples of conditions that may warrant further investigation include:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers. This size can be inhaled and would be of concern for determining if this pathway is complete.

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

Comments:

NA

**Direct Contact with Sediment**

This pathway involves people's hands being exposed to sediment, such as during recreational or some types of subsistence activities. People then incidentally **ingest** sediment from normal hand-to-mouth activities. In addition, **dermal absorption of contaminants** may be of concern if people come in contact with sediment and the contaminants are able to permeate the skin (see dermal exposure to soil section). This type of exposure is rare but it should be investigated if:

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

ADEC soil ingestion cleanup levels are protective of direct contact with sediment. If they are determined to be over-protective for sediment exposure at a particular site, other screening levels could be adopted or developed.

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

Comments:

NA

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

All soil within 5' of surface expected to be excavated and removed from area

# APPENDIX A

## BIOACCUMULATIVE COMPOUNDS

### Table A-1: List of Compounds of Potential Concern for Bioaccumulation

Organic compounds are identified as bioaccumulative if they have a BCF equal to or greater than 1,000 or a log $K_{ow}$ greater than 3.5. Inorganic compounds are identified as bioaccumulative if they are listed as such by EPA (2000). Those compounds in Table X of 18 AAC 75.345 that are bioaccumulative, based on the definition above, are listed below.

| | | |
|---|---|---|
| Aldrin | DDT | Lead |
| Arsenic | Dibenzo(a,h)anthracene | Mercury |
| Benzo(a)anthracene | Dieldrin | Methoxychlor |
| Benzo(a)pyrene | Dioxin | Nickel |
| Benzo(b)fluoranthene | Endrin | PCBs |
| Benzo(k)fluoranthene | Fluoranthene | |
| Cadmium | Heptachlor | Pyrene |
| Chlordane | Heptachlor epoxide | Selenium |
| Chrysene | Hexachlorobenzene | Silver |
| Copper | Hexachlorocyclopentadiene | Toxaphene |
| DDD | Indeno(1,2,3-c,d)pyrene | Zinc |
| DDE | | |

Because BCF values can relatively easily be measured or estimated, the BCF is frequently used to determine the potential for a chemical to bioaccumulate. A compound with a BCF greater than 1,000 is considered to bioaccumulate in tissue (EPA 2004b).

For inorganic compounds, the BCF approach has not been shown to be effective in estimating the compound's ability to bioaccumulate. Information available, either through scientific literature or site-specific data, regarding the bioaccumulative potential of an inorganic site contaminant should be used to determine if the pathway is complete.

The list was developed by including organic compounds that either have a BCF equal to or greater than 1,000 or a log $K_{ow}$ greater than 3.5 and inorganic compounds that are listed by the United States Environmental Protection Agency (EPA) as being bioaccumulative (EPA 2000). The BCF can also be estimated from a chemical's physical and chemical properties. A chemical's octanol-water partitioning coefficient ($K_{ow}$) along with defined regression equations can be used to estimate the BCF. EPA's Persistent, Bioaccumulative, and Toxic (PBT) Profiler (EPA 2004) can be used to estimate the BCF using the $K_{ow}$ and linear regressions presented by Meylan et al. (1996). The PBT Profiler is located at http://www.pbtprofiler.net/. For compounds not found in the PBT Profiler, DEC recommends using a log $K_{ow}$ greater than 3.5 to determine if a compound is bioaccumulative.

# APPENDIX B

## VOLATILE COMPOUNDS

**Table B-1: List of Volatile Compounds of Potential Concern**
Common volatile contaminants of concern at contaminated sites. A chemical is defined as volatile if the Henry's Law constant is 1 x $10^{-5}$ atm-$m^3$/mol or greater and the molecular weight less than 200 g/mole (g/mole; EPA 2004a). Those compounds in Table X of 18 AAC 75.345 that are volatile, based on the definition above, are listed below.

| | | |
|---|---|---|
| Acenaphthene | 1,4-dichlorobenzene | Pyrene |
| Acetone | 1,1-dichloroethane | Styrene |
| Anthracene | 1,2-dichloroethane | 1,1,2,2-tetrachloroethane |
| Benzene | 1,1-dichloroethylene | Tetrachloroethylene |
| Bis(2-chlorethyl)ether | Cis-1,2-dichloroethylene | Toluene |
| Bromodichloromethane | Trans-1,2-dichloroethylene | 1,2,4-trichlorobenzene |
| Carbon disulfide | 1,2-dichloropropane | 1,1,1-trichloroethane |
| Carbon tetrachloride | 1,3-dichloropropane | 1,1,2-trichloroethane |
| Chlorobenzene | Ethylbenzene | Trichloroethylene |
| Chlorodibromomethane | Fluorene | Vinyl acetate |
| Chloroform | Methyl bromide | Vinyl chloride |
| 2-chlorophenol | Methylene chloride | Xylenes |
| Cyanide | Naphthalene | GRO |
| 1,2-dichlorobenzene | Nitrobenzene | DRO |

# APPENDIX C

## COMPOUNDS OF CONCERN FOR VAPOR MIGRATION

### Table C-1: List of Compounds of Potential Concern for the Vapor Migration

A chemical is considered sufficiently toxic if the vapor concentration of the pure component poses an incremental lifetime cancer risk greater than 10-6 or a non-cancer hazard index greater than 1. A chemical is considered sufficiently volatile if it's Henry's Law constant is 1 x $10^{-5}$ atm-$m^3$/mol or greater.

| | | |
|---|---|---|
| Acenaphthene | Dibenzofuran | Hexachlorobenzene |
| Acetaldehyde | 1,2-Dibromo-3-chloropropane | Hexachlorocyclopentadiene |
| Acetone | 1,2-Dibromoethane (EDB) | Hexachloroethane |
| Acetonitrile | 1,3-Dichlorobenzene | Hexane |
| Acetophenone | 1,2-Dichlorobenzene | Hydrogen cyanide |
| Acrolein | 1,4-Dichlorobenzene | Isobutanol |
| Acrylonitrile | 2-Nitropropane | Mercury (elemental) |
| Aldrin | N-Nitroso-di-n-butylamine | Methacrylonitrile |
| alpha-HCH (alpha-BHC) | n-Propylbenzene | Methoxychlor |
| Benzaldehyde | o-Nitrotoluene | Methyl acetate |
| Benzene | o-Xylene | Methyl acrylate |
| Benzo(b)fluoranthene | p-Xylene | Methyl bromide |
| Benzylchloride | Pyrene | Methyl chloride chloromethane) |
| beta-Chloronaphthalene | sec-Butylbenzene | Methylcyclohexane |
| Biphenyl | Styrene | Methylene bromide |
| Bis(2-chloroethyl)ether | tert-Butylbenzene | Methylene chloride |
| Bis(2-chloroisopropyl)ether | 1,1,1,2-Tetrachloroethane | Methylethylketone (2-butanone) |
| Bis(chloromethyl)ether | 1,1,2,2-Tetrachloroethane | Methylisobutylketone |
| Bromodichloromethane | Tetrachloroethylene | Methylmethacrylate |
| Bromoform | Dichlorodifluoromethane | 2-Methylnaphthalene |
| 1,3-Butadiene | 1,1-Dichloroethane | MTBE |
| Carbon disulfide | 1,2-Dichloroethane | m-Xylene |
| Carbon tetrachloride | 1,1-Dichloroethylene | Naphthalene |
| Chlordane | 1,2-Dichloropropane | n-Butylbenzene |
| 2-Chloro-1,3-butadiene (chloroprene) | 1,3-Dichloropropene | Nitrobenzene |
| Chlorobenzene | Dieldrin | Toluene |
| 1-Chlorobutane | Endosulfan | trans-1,2-Dichloroethylene |
| Chlorodibromomethane | Epichlorohydrin | 1,1,2-Trichloro-1,2,2-trifluoroethane |
| Chlorodifluoromethane | Ethyl ether | 1,2,4-Trichlorobenzene |
| Chloroethane (ethyl chloride) | Ethylacetate | 1,1,2-Trichloroethane |
| Chloroform | Ethylbenzene | 1,1,1-Trichloroethane |
| 2-Chlorophenol | Ethylene oxide | Trichloroethylene |
| 2-Chloropropane | Ethylmethacrylate | Trichlorofluoromethane |
| Chrysene | Fluorene | 1,2,3-Trichloropropane |
| cis-1,2-Dichloroethylene | Furan | 1,2,4-Trimethylbenzene |
| Crotonaldehyde (2-butenal) | Gamma-HCH (Lindane) | 1,3,5-Trimethylbenzene |
| Cumene | Heptachlor | Vinyl acetate |
| DDE | Hexachloro-1,3-butadiene | Vinyl chloride (chloroethene) |

Source: EPA 2002.

# Appendix 5

# Laboratory Data Review Checklist

| | |
|---|---|
| Completed by: | Ronald J. Pratt |
| Title: | Environmental Scientist |
| Date: | October 17, 2008 |
| CS Report Name: | NC Machinery, Soil Characterization and Sampling Report |
| Report Date: | October 30, 2008 |
| Consultant Firm: | NORTECH |
| Laboratory Name: | Test America |
| Laboratory Report Number: | ARI0057 and BRI0251 |
| ADEC File Number: | |
| ADEC RecKey Number: | |

1. Laboratory

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

   ☑ Yes ☐ No Comments:

   yes

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

   ☐ Yes ☐ No Comments:

   Not applicable

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ☑ Yes ☐ No Comments:

   yes

b. Correct analyses requested?

☑ Yes ☐ No Comments:

yes

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

☑ Yes ☐ No Comments:

yes for ARI0057, no cooler temp documented for BRI0251

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

☑ Yes ☐ No Comments:

yes

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

☑ Yes ☐ No Comments:

yes

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

☑ Yes ☐ No Comments:

Not applicable

e. Data quality or usability affected? Explain.

Comments:

Data quality/usability not affected

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No Comments:

yes

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

☑ Yes ☐ No Comments:

yes, all three ARI0057 samples required dilution due to high concentrations of target analyte. due to matrix interference, surrogate recovery was outside acceptance limits for one sample (Highest DRO concentration), but second surrogate recovery was within acceptable limits. MS and/or MSD were below acceptable limits in the Laboratory Control Sample; Blank Spike. The calibration verification recovery for 2-Butanone were above method control limits in all three VOC samples (BRI0251), the trip blank, and the LCS Blank.

c. Were all corrective actions documented?

☑ Yes ☐ No Comments:

yes

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

Comments:

ARI0057-Does not adversly affect the data quality/usability of sample data, samples were collected for characterization purposes and all three samples had DRO contamination significantly above cleanup levels. BRI0251-Does not adversly affect the data quality/usability of sample data, samples were collected for characterization purposes, an additional check standard was analyzed at the reporting limits to ensure instrument sensitivity at the reporting limits and and this analyte was not detected in any of the samples

5. Samples Results

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

☑ Yes ☐ No Comments:

yes

b. All applicable holding times met?

☑ Yes ☐ No Comments:

yes

c. All soils reported on a dry weight basis?

☑ Yes ☐ No Comments:

not applicable

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

yes

☒ Yes ☐ No Comments:

e. Data quality or usability affected? Explain.
Comments:

data quality/usability not affected

6. QC Samples

a. Method Blank
i. One method blank reported per matrix, analysis and 20 samples?
☒ Yes ☐ No Comments:

yes

ii. All method blank results less than PQL?
☒ Yes ☐ No Comments:

yes

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

Not applicable

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?
☒ Yes ☐ No Comments:

Not applicable

v. Data quality or usability affected? Explain.
Comments:

data quality/usability not affected

b. Laboratory Control Sample/Duplicate (LCS/LCSD)
i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples?
☒ Yes ☐ No Comments:

yes

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?
☐ Yes ☐ No Comments:

Not applicable

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

☐ Yes ☒ No Comments:

no ARI0057-MS and/or MSD were below acceptable limits in the LCS for RRO contaminants, but were within acceptable range for DRO; no RRO contaminants were identified in any of the samples, but high concentrations of DRO contaminants were detected in all samples

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

☐ Yes ☒ No Comments:

no, see note above

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

Comments:

Not applicable

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

☒ Yes ☐ No Comments:

yese

vii. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected; problem resulted from dilution of sample with high DRO concentrtations and no RRO contaminants were detected in any of the characterization samples.

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☒ Yes ☐ No Comments:

yes

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐ Yes ☒ No Comments:

no, ARI0057- initial surrogate recovery for one sample was outside acceptable limits, but second surrogate recovery for the sample was within acceptable limits

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☑ Yes ☐ No Comments:

yese

iv. Data quality or usability affected? Explain.

Comments:

ARI-0057data quality/usability not adversly affected; surrogate recovery of second surrogate was within acceptable limits

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

i. One trip blank reported per matrix, analysis and cooler?

☑ Yes ☐ No Comments:

yes

ii. All results less than PQL?

☑ Yes ☐ No Comments:

yes

iii. If above PQL, what samples are affected?

Comments:

Not applicable

iv. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

e. Field Duplicate

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

☐ Yes ☑ No Comments:

no

ii. Submitted blind to lab?

☑ Yes ☐ No Comments:

not applicable

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

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

Where $R_1$ = Sample Concentration
$R_2$ = Field Duplicate Concentration

☐ Yes ☒ No Comments:

not applicable

iv. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☐ Not Applicable

i. All results less than PQL?

☐ Yes ☐ No Comments:

Not applicable

ii. If above PQL, what samples are affected?

Comments:

Not applicable

iii. Data quality or usability affected? Explain.

Comments:

Not applicable

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

a. Defined and appropriate?

☐ Yes ☐ No Comments:

Not applicable

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CS Approval Number: UST-067

September 18, 2008

Ron Pratt
Nortech
2400 College Road
Fairbanks, AK/USA 99709

RE: 08 1082

Enclosed are the results of analyses for samples received by the laboratory on 09/16/08 11:30. The following list is a summary of the Work Orders contained in this report, generated on 09/18/08 13:20.

If you have any questions concerning this report, please feel free to contact me.

| Work Order | Project | ProjectNumber |
|---|---|---|
| ARI0057 | 08 1082 | [none] |



Rachel J James For Troy J. Engstrom, Lab Director

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CS Approval Number: UST-067

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08 1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK/USA 99709 | Project Manager: | Ron Pratt | 09/18/08 13:20 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| S1 | ARI0057-01 | Soil | 09/15/08 18:00 | 09/16/08 11:30 |
| S2 | ARI0057-02 | Soil | 09/15/08 18:10 | 09/16/08 11:30 |
| S3 | ARI0057-03 | Soil | 09/15/08 18:20 | 09/16/08 11:30 |

TestAmerica Anchorage

Rachel J James For Troy J. Engstrom, Lab Director

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CS Approval Number: UST-067

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08 1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK/USA 99709 | Project Manager: | Ron Pratt | 09/18/08 13:20 |

## Diesel Range Organics (C10-C25) and Residual Range Organics (C25-C36) per AK102/RRO

TestAmerica Anchorage

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Analyst | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ARI0057-01 (S1)** | | **Soil** | | | | | **Sampled: 09/15/08 18:00** | | | | |
| **Diesel Range Organics** | AK102/103 | **16100** | ----- | 259 | mg/kg dry | 10x | 8090068 | 09/16/08 14:38 | 09/17/08 17:07 | JN | **RL7** |
| Residual Range Organics | " | ND | ----- | 647 | " | " | " | " | " | JN | **RL7** |
| *Surrogate(s): 1-Chlorooctadecane* | | | *156%* | | *50 - 150 %* | " | | | " | | ***Z5*** |
| *Triacontane* | | | *102%* | | *50 - 150 %* | " | | | " | | |
| **ARI0057-02 (S2)** | | **Soil** | | | | | **Sampled: 09/15/08 18:10** | | | | |
| **Diesel Range Organics** | AK102/103 | **8160** | ----- | 198 | mg/kg dry | 10x | 8090068 | 09/16/08 14:38 | 09/17/08 17:07 | JN | **RL7** |
| Residual Range Organics | " | ND | ----- | 494 | " | " | " | " | " | JN | **RL7** |
| *Surrogate(s): 1-Chlorooctadecane* | | | *140%* | | *50 - 150 %* | " | | | " | | |
| *Triacontane* | | | *96.5%* | | *50 - 150 %* | " | | | " | | |
| **ARI0057-03 (S3)** | | **Soil** | | | | | **Sampled: 09/15/08 18:20** | | | | |
| **Diesel Range Organics** | AK102/103 | **4480** | ----- | 232 | mg/kg dry | 10x | 8090068 | 09/16/08 14:38 | 09/17/08 17:40 | JN | **RL7** |
| Residual Range Organics | " | ND | ----- | 579 | " | " | " | " | " | JN | **RL7** |
| *Surrogate(s): 1-Chlorooctadecane* | | | *121%* | | *50 - 150 %* | " | | | " | | |
| *Triacontane* | | | *101%* | | *50 - 150 %* | " | | | " | | |

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CS Approval Number: UST-067

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08 1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK/USA 99709 | Project Manager: | Ron Pratt | 09/18/08 13:20 |

## Physical Parameters by APHA/ASTM/EPA Methods

TestAmerica Anchorage

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Analyst | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **ARI0057-01 (S1)** | | **Soil** | | | | **Sampled: 09/15/08 18:00** | | | | | |
| **Dry Weight** | TA-SOP | **75.9** | ----- | 1.00 | % | 1x | 8090071 | 09/17/08 12:45 | 09/18/08 08:30 | JN | |
| **ARI0057-02 (S2)** | | **Soil** | | | | **Sampled: 09/15/08 18:10** | | | | | |
| **Dry Weight** | TA-SOP | **96.3** | ----- | 1.00 | % | 1x | 8090071 | 09/17/08 12:45 | 09/18/08 08:30 | JN | |
| **ARI0057-03 (S3)** | | **Soil** | | | | **Sampled: 09/15/08 18:20** | | | | | |
| **Dry Weight** | TA-SOP | **85.6** | ----- | 1.00 | % | 1x | 8090071 | 09/17/08 12:45 | 09/18/08 08:30 | JN | |

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CS Approval Number: UST-067

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08 1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK/USA 99709 | Project Manager: | Ron Pratt | 09/18/08 13:20 |

## Diesel Range Organics (C10-C25) and Residual Range Organics (C25-C36) per AK102/RRO - Laboratory Quality Control Results

TestAmerica Anchorage

**QC Batch: 8090068** **Soil Preparation Method: EPA 3545**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8090068-BLK1)** | | | | | | | **Extracted: 09/16/08 14:38** | | | | | | | |
| Diesel Range Organics | AK102/103 | ND | --- | 20.0 | mg/kg wet | 1x | -- | -- | -- | -- | -- | -- | 09/17/08 11:11 | |
| Residual Range Organics | " | ND | --- | 50.0 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1-Chlorooctadecane* | | *Recovery: 90.8%* | | | *Limits: 50-150%* | " | | | | | | | *09/17/08 11:11* | |
| *Triacontane* | | *78.8%* | | | *50-150%* | " | | | | | | | " | |
| **LCS (8090068-BS1)** | | | | | | | **Extracted: 09/16/08 14:38** | | | | | | | |
| Diesel Range Organics | AK102/103 | 138 | --- | 20.0 | mg/kg wet | 1x | -- | 129 | 107% | (75-125) | -- | -- | 09/17/08 11:44 | |
| Residual Range Organics | " | 119 | --- | 50.0 | " | " | -- | " | 92.3% | (60-120) | -- | -- | " | |
| *Surrogate(s): 1-Chlorooctadecane* | | *Recovery: 96.8%* | | | *Limits: 60-120%* | " | | | | | | | *09/17/08 11:44* | |
| *Triacontane* | | *83.2%* | | | *60-120%* | " | | | | | | | " | |
| **LCS Dup (8090068-BSD1)** | | | | | | | **Extracted: 09/16/08 14:38** | | | | | | | |
| Diesel Range Organics | AK102/103 | 135 | --- | 20.0 | mg/kg wet | 1x | -- | 129 | 104% | (75-125) | 2.50% | (20) | 09/17/08 12:16 | |
| Residual Range Organics | " | 117 | --- | 50.0 | " | " | -- | " | 91.2% | (60-120) | 1.17% | " | " | |
| *Surrogate(s): 1-Chlorooctadecane* | | *Recovery: 94.7%* | | | *Limits: 60-120%* | " | | | | | | | *09/17/08 12:16* | |
| *Triacontane* | | *82.4%* | | | *60-120%* | " | | | | | | | " | |
| **Duplicate (8090068-DUP1)** | | | | | | | **QC Source: ARI0050-03** **Extracted: 09/16/08 14:38** | | | | | | | |
| Diesel Range Organics | AK102/103 | 41.5 | --- | 20.6 | mg/kg dry | 1x | 43.2 | -- | -- | -- | 3.88% | (20) | 09/17/08 11:11 | |
| Residual Range Organics | " | 167 | --- | 51.5 | " | " | 191 | -- | -- | -- | 13.6% | " | " | |
| *Surrogate(s): 1-Chlorooctadecane* | | *Recovery: 103%* | | | *Limits: 50-150%* | " | | | | | | | *09/17/08 11:11* | |
| *Triacontane* | | *98.8%* | | | *50-150%* | " | | | | | | | " | |
| **Matrix Spike (8090068-MS1)** | | | | | | | **QC Source: ARI0050-03** **Extracted: 09/16/08 14:38** | | | | | | | |
| Diesel Range Organics | AK102/103 | 165 | --- | 20.3 | mg/kg dry | 1x | 43.2 | 131 | 93.5% | (75-125) | -- | -- | 09/17/08 12:16 | |
| Residual Range Organics | " | 271 | --- | 50.7 | " | " | 191 | " | 60.6% | (60-150) | -- | -- | " | |
| *Surrogate(s): 1-Chlorooctadecane* | | *Recovery: 101%* | | | *Limits: 50-150%* | " | | | | | | | *09/17/08 12:16* | |
| *Triacontane* | | *98.2%* | | | *50-150%* | " | | | | | | | " | |
| **Matrix Spike Dup (8090068-MSD1)** | | | | | | | **QC Source: ARI0050-03** **Extracted: 09/16/08 14:38** | | | | | | | |
| Diesel Range Organics | AK102/103 | 174 | --- | 20.0 | mg/kg dry | 1x | 43.2 | 129 | 102% | (75-125) | 5.46% | (25) | 09/17/08 12:48 | |
| Residual Range Organics | " | 268 | --- | 49.9 | " | " | 191 | " | 59.7% | (60-150) | 0.880% | " | " | M8 |
| *Surrogate(s): 1-Chlorooctadecane* | | *Recovery: 115%* | | | *Limits: 50-150%* | " | | | | | | | *09/17/08 12:48* | |
| *Triacontane* | | *99.9%* | | | *50-150%* | " | | | | | | | " | |

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CS Approval Number: UST-067

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08 1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK/USA 99709 | Project Manager: | Ron Pratt | 09/18/08 13:20 |

## Physical Parameters by APHA/ASTM/EPA Methods - Laboratory Quality Control Results

TestAmerica Anchorage

**QC Batch: 8090071** **Soil Preparation Method: *** DEFAULT PREP**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Duplicate (8090071-DUP1)** | | | | **QC Source: ARI0031-23** | | | | **Extracted: 09/17/08 12:45** | | | | | | |
| Dry Weight | TA-SOP | 95.5 | --- | 1.00 | % | 1x | 95.9 | -- | -- | -- | 0.324% | (25) | 09/18/08 08:30 | |

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ANCHORAGE, AK 99502-1119
ph: (907) 563.9200 fax: (907) 563.9210
CS Approval Number: UST-067

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08 1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK/USA 99709 | Project Manager: | Ron Pratt | 09/18/08 13:20 |

## Notes and Definitions

Report Specific Notes:

| | | |
|---|---|---|
| M8 | - | The MS and/or MSD were below the acceptance limits. See Blank Spike (LCS). |
| RL7 | - | Sample required dilution due to high concentrations of target analyte. |
| Z5 | - | Due to sample matrix effects, the surrogate recovery was outside acceptance limits. Secondary surrogate recovery was within the acceptance limits. |

Laboratory Reporting Conventions:

| | | |
|---|---|---|
| DET | - | Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only. |
| ND | - | Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate). |
| NR/NA | - | Not Reported / Not Available |
| dry | - | Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight. |
| wet | - | Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis. |
| RPD | - | RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries). |
| MRL | - | METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table. |
| MDL* | - | METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results. |
| Dil | - | Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data. |
| Reporting Limits | - | Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable. |
| Electronic Signature | - | Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature. |



Rachel J James For Troy J. Engstrom, Lab Director

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING


11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** AR10057

CLIENT: Nortech

REPORT TO: Nortech - Ron Pratt
ADDRESS: 2400 College Rd
Fairbanks, AK
PHONE: 907 452 5688 FAX: 907 452 5694

INVOICE TO: Nortech
2400 College Rd
Fairbanks AK 99709

P.O. NUMBER: 08 1082

PROJECT NAME: 08 1082

PROJECT NUMBER:

SAMPLED BY: CJP

**TURNAROUND REQUEST**
in Business Days *

Organic & Inorganic Analyses: [10] STD. [7] [5] [4] [3] [2] [1] [<1]

Petroleum Hydrocarbon Analyses: [5] STD. [4] [3] [2] [1] [<1]

[OTHER] Specify:

* Turnaround Requests less than standard may incur Rush Charges.

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | REQUESTED ANALYSES: AK102 103 DRO/RRO | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|
| 1 | S1 | 9/15/08 1800 | X | S | 1 | | 1 |
| 2 | S2 | 9/15/08 1810 | X | S | 1 | | 2 |
| 3 | S3 | 9/15/08 1820 | X | S | 1 | | 3 |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | | |

PRESERVATIVE

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |

RELEASED BY: Ronald J. Pratt DATE: 9/15/08
PRINT NAME: Ronald J. Pratt FIRM: Nortech TIME: 1915

RECEIVED BY: [signature] DATE: 09/16/08
PRINT NAME: Shannon Dreher FIRM: Anchorage TIME: 1130

RELEASED BY: DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY: DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

TEMP: 2.4°C

PAGE OF

TAL-1000(0408)

# Test America Anchorage Cooler Receipt Form

(Army Corps. Compliant)

WORK ORDER # AR10057 CLIENT: Nortech PROJECT: ES - 1052

Date /Time Cooler Arrived 09 / 16 / 08 11:30 Cooler signed for by: Johanna Drehr (Print name)

## Preliminary Examination Phase:

Date cooler opened: ☒ same as date received or ___/___/___

Cooler opened by (print) Johanna Drehr (sign) [signature]

1. Delivered by ☒ ALASKA AIRLINES ☐ Fed-Ex ☐ UPS ☐ NAC ☐ LYNDEN ☐ CLIENT ☐ Other:

Shipment Tracking # if applicable 1447 0201 (include copy of shipping papers in file)

2. Number of Custody Seals 2 Signed by Ronald J Pratt Date 09 / 15 / 08

Were custody seals unbroken and intact on arrival? ☒ Yes ☐ No

3. Were custody papers sealed in a plastic bag? ☒ Yes ☐ No

4. Were custody papers filled out properly (ink, signed, etc.)? ☒ Yes ☐ No

5. Did you sign the custody papers in the appropriate place? ☒ Yes ☐ No

6. Was ice used? ☒ Yes ☐ No Type of ice: ☐ blue ice ☒ gel ice ☐ real ice ☐ dry ice Condition of Ice: Soft

Temperature by Digi-Thermo Probe 2.6 °C Thermometer # rec #3

Acceptance Criteria: 0 - 6°C

7. Packing in Cooler: ☒ bubble wrap ☐ styrofoam ☒ cardboard ☐ Other:

8. Did samples arrive in plastic bags? ☐ Yes ☒ No

9. Did all bottles arrive unbroken, and with labels in good condition? ☒ Yes ☐ No

10. Are all bottle labels complete (ID, date, time, etc.) ☒ Yes ☐ No

11. Do bottle labels and Chain of Custody agree? ☒ Yes ☐ No

12. Are the containers and preservatives correct for the tests indicated? ☒ Yes ☐ No

13. Conoco Phillips, Alyeska, BP H2O samples only: pH < 2? ☐ Yes ☐ No ☒ N/A

14. Is there adequate volume for the tests requested? ☒ Yes ☐ No

15. Were VOA vials free of bubbles? ☒ N/A ☐ Yes ☐ No

If "NO" which containers contained "head space" or bubbles? ___

## Log-in Phase:

Date of sample log-in 9 / 16 / 08

Samples logged in by (print) Kyle Burrows (sign) [signature]

1. Was project identifiable from custody papers? ☒ Yes ☐ No
2. Do Turn Around Times and Due Dates agree? ☒ Yes ☐ No
3. Was the Project Manager notified of status? ☒ Yes ☐ No
4. Was the Lab notified of status? ☒ Yes ☐ No
5. Was the COC scanned and copied? ☒ Yes ☐ No


Custody Seal 9/15/08

DATE

SIGNATURE

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
149477

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
149477

Custody Seal 9/15/08

DATE

SIGNATURE

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
283597

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
283597

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

September 19, 2008

Ron Pratt
Nortech
2400 College Road
Fairbanks, AK 99709

RE: 08-1082

Enclosed are the results of analyses for samples received by the laboratory on 09/16/08 16:45. The following list is a summary of the Work Orders contained in this report, generated on 09/19/08 14:33.

If you have any questions concerning this report, please feel free to contact me.

| Work Order | Project | ProjectNumber |
|---|---|---|
| BRI0251 | 08-1082 | [none] |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## ANALYTICAL REPORT FOR SAMPLES

| Sample ID | Laboratory ID | Matrix | Date Sampled | Date Received |
|---|---|---|---|---|
| S1 | BRI0251-01 | Soil | 09/15/08 18:00 | 09/16/08 16:45 |
| S2 | BRI0251-02 | Soil | 09/15/08 18:10 | 09/16/08 16:45 |
| S3 | BRI0251-03 | Soil | 09/15/08 18:20 | 09/16/08 16:45 |
| TB | BRI0251-04 | Soil | 09/15/08 17:00 | 09/16/08 16:45 |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-01 (S1)** | | **Soil** | | | **Sampled: 09/15/08 18:00** | | | | | |
| Acetone | EPA 8260B | ND | ----- | 1.47 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 17:51 | |
| **Benzene** | " | **0.231** | ----- | 0.00586 | " | " | " | " | " | |
| Bromobenzene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Bromochloromethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Bromodichloromethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 2-Butanone | " | ND | ----- | 1.47 | " | " | " | " | " | C5 |
| **n-Butylbenzene** | " | **1.52** | ----- | 0.147 | " | " | " | " | " | |
| **sec-Butylbenzene** | " | **1.22** | ----- | 0.147 | " | " | " | " | " | |
| **tert-Butylbenzene** | " | **0.0771** | ----- | 0.0293 | " | " | " | " | " | |
| Carbon disulfide | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1-Chlorohexane | " | ND | ----- | 0.293 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.147 | " | " | " | " | " | |
| 2-Chlorotoluene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 4-Chlorotoluene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | ----- | 0.147 | " | " | " | " | " | |
| 1,2-Dibromoethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Dibromomethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Dichlorodifluoromethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,3-Dichloropropane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 2,2-Dichloropropane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,1-Dichloropropene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| **Ethylbenzene** | " | **1.00** | ----- | 0.0293 | " | " | " | " | " | |
| Hexachlorobutadiene | " | ND | ----- | 0.586 | " | " | " | " | " | |
| Methyl tert-butyl ether | " | ND | ----- | 0.147 | " | " | " | " | " | |
| n-Hexane | " | ND | ----- | 0.147 | " | " | " | " | " | |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-01 (S1)** | | **Soil** | | | **Sampled: 09/15/08 18:00** | | | | | |
| 2-Hexanone | EPA 8260B | ND | ----- | 0.586 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 17:51 | |
| **Isopropylbenzene** | " | **0.767** | ----- | 0.0293 | " | " | " | " | " | |
| **p-Isopropyltoluene** | " | **0.706** | ----- | 0.0293 | " | " | " | " | " | |
| 4-Methyl-2-pentanone | " | ND | ----- | 0.293 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 0.586 | " | " | " | " | " | |
| **n-Propylbenzene** | " | **1.11** | ----- | 0.0293 | " | " | " | " | " | |
| Styrene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,2,3-Trichlorobenzene | " | ND | ----- | 0.586 | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | " | ND | ----- | 0.293 | " | " | " | " | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| **Toluene** | " | **0.651** | ----- | 0.0293 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| 1,2,3-Trichloropropane | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| **1,3,5-Trimethylbenzene** | " | **1.97** | ----- | 0.0293 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.0293 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *107%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *104%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *99.2%* | | *75 - 125 %* | " | | | " | |
| **BRI0251-01RE1 (S1)** | | **Soil** | | | **Sampled: 09/15/08 18:00** | | | | | |
| **Naphthalene** | EPA 8260B | **12.6** | ----- | 5.86 | mg/kg wet | 10x | 8I17005 | 09/17/08 07:35 | 09/19/08 11:05 | |
| **1,2,4-Trimethylbenzene** | " | **6.02** | ----- | 0.293 | " | " | " | " | " | |
| **o-Xylene** | " | **2.43** | ----- | 0.293 | " | " | " | " | " | |
| **m,p-Xylene** | " | **3.81** | ----- | 0.586 | " | " | " | " | " | |
| **Total Xylenes** | " | **6.24** | ----- | 0.879 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *103%* | | *75 - 125 %* | *1x* | | | " | |
| *Toluene-d8* | | | *104%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *99.6%* | | *75 - 125 %* | " | | | " | |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-02 (S2)** | | **Soil** | | | **Sampled: 09/15/08 18:10** | | | | | |
| Acetone | EPA 8260B | ND | ----- | 1.40 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 18:17 | |
| Benzene | " | ND | ----- | 0.00562 | " | " | " | " | " | |
| Bromobenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Bromochloromethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Bromodichloromethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 2-Butanone | " | ND | ----- | 1.40 | " | " | " | " | " | C5 |
| **n-Butylbenzene** | " | **1.02** | ----- | 0.140 | " | " | " | " | " | |
| **sec-Butylbenzene** | " | **0.213** | ----- | 0.140 | " | " | " | " | " | |
| **tert-Butylbenzene** | " | **0.119** | ----- | 0.0281 | " | " | " | " | " | |
| Carbon disulfide | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1-Chlorohexane | " | ND | ----- | 0.281 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.140 | " | " | " | " | " | |
| 2-Chlorotoluene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 4-Chlorotoluene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | ----- | 0.140 | " | " | " | " | " | |
| 1,2-Dibromoethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Dibromomethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Dichlorodifluoromethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,3-Dichloropropane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 2,2-Dichloropropane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,1-Dichloropropene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Ethylbenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Hexachlorobutadiene | " | ND | ----- | 0.562 | " | " | " | " | " | |
| Methyl tert-butyl ether | " | ND | ----- | 0.140 | " | " | " | " | " | |
| n-Hexane | " | ND | ----- | 0.140 | " | " | " | " | " | |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-02 (S2)** | | **Soil** | | | **Sampled: 09/15/08 18:10** | | | | | |
| 2-Hexanone | EPA 8260B | ND | ----- | 0.562 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 18:17 | |
| Isopropylbenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| **p-Isopropyltoluene** | " | **0.465** | ----- | 0.0281 | " | " | " | " | " | |
| 4-Methyl-2-pentanone | " | ND | ----- | 0.281 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 0.562 | " | " | " | " | " | |
| n-Propylbenzene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Styrene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,2,3-Trichlorobenzene | " | ND | ----- | 0.562 | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | " | ND | ----- | 0.281 | " | " | " | " | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Toluene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| 1,2,3-Trichloropropane | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| **1,2,4-Trimethylbenzene** | " | **2.05** | ----- | 0.0281 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| o-Xylene | " | ND | ----- | 0.0281 | " | " | " | " | " | |
| m,p-Xylene | " | ND | ----- | 0.0562 | " | " | " | " | " | |
| Total Xylenes | " | ND | ----- | 0.0843 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *105%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *116%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *102%* | | *75 - 125 %* | " | | | " | |
| **BRI0251-02RE1 (S2)** | | **Soil** | | | **Sampled: 09/15/08 18:10** | | | | | |
| **Naphthalene** | EPA 8260B | **12.0** | ----- | 5.62 | mg/kg wet | 10x | 8I17005 | 09/17/08 07:35 | 09/19/08 11:32 | |
| **1,3,5-Trimethylbenzene** | " | **4.02** | ----- | 0.281 | " | " | " | " | " | |
| *Surrogate(s):* *1,2-DCA-d4* | | | *103%* | | *75 - 125 %* | *1x* | | | " | |
| *Toluene-d8* | | | *103%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *99.8%* | | *75 - 125 %* | " | | | " | |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

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BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-03 (S3)** | | **Soil** | | | **Sampled: 09/15/08 18:20** | | | | | |
| Acetone | EPA 8260B | ND | ----- | 1.84 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 16:57 | |
| Benzene | " | ND | ----- | 0.00736 | " | " | " | " | " | |
| Bromobenzene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Bromochloromethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Bromodichloromethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 2-Butanone | " | ND | ----- | 1.84 | " | " | " | " | " | C5 |
| **n-Butylbenzene** | " | **0.780** | ----- | 0.184 | " | " | " | " | " | |
| **sec-Butylbenzene** | " | **1.02** | ----- | 0.184 | " | " | " | " | " | |
| **tert-Butylbenzene** | " | **0.0614** | ----- | 0.0368 | " | " | " | " | " | |
| Carbon disulfide | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1-Chlorohexane | " | ND | ----- | 0.368 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.184 | " | " | " | " | " | |
| 2-Chlorotoluene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 4-Chlorotoluene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | ----- | 0.184 | " | " | " | " | " | |
| 1,2-Dibromoethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Dibromomethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Dichlorodifluoromethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,3-Dichloropropane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 2,2-Dichloropropane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,1-Dichloropropene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| **Ethylbenzene** | " | **0.0585** | ----- | 0.0368 | " | " | " | " | " | |
| Hexachlorobutadiene | " | ND | ----- | 0.736 | " | " | " | " | " | |
| Methyl tert-butyl ether | " | ND | ----- | 0.184 | " | " | " | " | " | |
| n-Hexane | " | ND | ----- | 0.184 | " | " | " | " | " | |

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-03 (S3)** | | **Soil** | | | **Sampled: 09/15/08 18:20** | | | | | |
| 2-Hexanone | EPA 8260B | ND | ----- | 0.736 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 16:57 | |
| **Isopropylbenzene** | " | **0.198** | ----- | 0.0368 | " | " | " | " | " | |
| **p-Isopropyltoluene** | " | **0.614** | ----- | 0.0368 | " | " | " | " | " | |
| 4-Methyl-2-pentanone | " | ND | ----- | 0.368 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 0.736 | " | " | " | " | " | |
| **n-Propylbenzene** | " | **0.213** | ----- | 0.0368 | " | " | " | " | " | |
| Styrene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,2,3-Trichlorobenzene | " | ND | ----- | 0.736 | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | " | ND | ----- | 0.368 | " | " | " | " | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Toluene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| 1,2,3-Trichloropropane | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| **1,2,4-Trimethylbenzene** | " | **2.41** | ----- | 0.0368 | " | " | " | " | " | |
| **1,3,5-Trimethylbenzene** | " | **1.19** | ----- | 0.0368 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.0368 | " | " | " | " | " | |
| **o-Xylene** | " | **0.152** | ----- | 0.0368 | " | " | " | " | " | |
| **m,p-Xylene** | " | **0.273** | ----- | 0.0736 | " | " | " | " | " | |
| **Total Xylenes** | " | **0.425** | ----- | 0.110 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *100%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *102%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *96.8%* | | *75 - 125 %* | " | | | " | |
| **BRI0251-03RE1 (S3)** | | **Soil** | | | **Sampled: 09/15/08 18:20** | | | | | |
| **Naphthalene** | EPA 8260B | **1.66** | ----- | 0.736 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/19/08 10:38 | |
| *Surrogate(s): 1,2-DCA-d4* | | | *102%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *100%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *97.4%* | | *75 - 125 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-04 (TB)** | | **Soil** | | | **Sampled: 09/15/08 17:00** | | | | | |
| **Acetone** | EPA 8260B | **7.01** | ----- | 6.31 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 16:01 | |
| Benzene | " | ND | ----- | 0.0253 | " | " | " | " | " | |
| Bromobenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Bromochloromethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Bromodichloromethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Bromoform | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Bromomethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 2-Butanone | " | ND | ----- | 6.31 | " | " | " | " | " | C5 |
| n-Butylbenzene | " | ND | ----- | 0.631 | " | " | " | " | " | |
| sec-Butylbenzene | " | ND | ----- | 0.631 | " | " | " | " | " | |
| tert-Butylbenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Carbon disulfide | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Carbon tetrachloride | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Chlorobenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Chloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1-Chlorohexane | " | ND | ----- | 1.26 | " | " | " | " | " | |
| Chloroform | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Chloromethane | " | ND | ----- | 0.631 | " | " | " | " | " | |
| 2-Chlorotoluene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 4-Chlorotoluene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Dibromochloromethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | ----- | 0.631 | " | " | " | " | " | |
| 1,2-Dibromoethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Dibromomethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2-Dichlorobenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,3-Dichlorobenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,4-Dichlorobenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Dichlorodifluoromethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,1-Dichloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2-Dichloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,1-Dichloroethene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| cis-1,2-Dichloroethene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| trans-1,2-Dichloroethene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2-Dichloropropane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,3-Dichloropropane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 2,2-Dichloropropane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,1-Dichloropropene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| cis-1,3-Dichloropropene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| trans-1,3-Dichloropropene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Ethylbenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Hexachlorobutadiene | " | ND | ----- | 2.53 | " | " | " | " | " | |
| Methyl tert-butyl ether | " | ND | ----- | 0.631 | " | " | " | " | " | |
| n-Hexane | " | ND | ----- | 0.631 | " | " | " | " | " | |

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B

TestAmerica Seattle

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Batch | Prepared | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **BRI0251-04 (TB)** | | **Soil** | | | **Sampled: 09/15/08 17:00** | | | | | |
| 2-Hexanone | EPA 8260B | ND | ----- | 2.53 | mg/kg wet | 1x | 8I17005 | 09/17/08 07:35 | 09/17/08 16:01 | |
| Isopropylbenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| p-Isopropyltoluene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 4-Methyl-2-pentanone | " | ND | ----- | 1.26 | " | " | " | " | " | |
| Methylene chloride | " | ND | ----- | 2.53 | " | " | " | " | " | |
| Naphthalene | " | ND | ----- | 2.53 | " | " | " | " | " | C |
| n-Propylbenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Styrene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2,3-Trichlorobenzene | " | ND | ----- | 2.53 | " | " | " | " | " | |
| 1,2,4-Trichlorobenzene | " | ND | ----- | 1.26 | " | " | " | " | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Tetrachloroethene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Toluene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,1,1-Trichloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,1,2-Trichloroethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Trichloroethene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Trichlorofluoromethane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2,3-Trichloropropane | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,2,4-Trimethylbenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| 1,3,5-Trimethylbenzene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| Vinyl chloride | " | ND | ----- | 0.126 | " | " | " | " | " | |
| o-Xylene | " | ND | ----- | 0.126 | " | " | " | " | " | |
| m,p-Xylene | " | ND | ----- | 0.253 | " | " | " | " | " | |
| Total Xylenes | " | ND | ----- | 0.379 | " | " | " | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | | *101%* | | *75 - 125 %* | " | | | " | |
| *Toluene-d8* | | | *102%* | | *75 - 125 %* | " | | | " | |
| *4-BFB* | | | *99.6%* | | *75 - 125 %* | " | | | " | |

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8I17005** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8I17005-BLK1)** | | | | | | | **Extracted: 09/17/08 07:35** | | | | | | | |
| Acetone | EPA 8260B | ND | --- | 5.00 | mg/kg wet | 1x | -- | -- | -- | -- | -- | -- | 09/17/08 13:13 | |
| Benzene | " | ND | --- | 0.0200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromochloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromodichloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Butanone | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | C5 |
| n-Butylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| sec-Butylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| tert-Butylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon disulfide | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1-Chlorohexane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Chlorotoluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 4-Chlorotoluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dibromoethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromomethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dichlorodifluoromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2,2-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

SEATTLE, WA 11720 NORTH CREEK PKWY N, SUITE 400
BOTHELL, WA 98011-8244
PH: (425) 420.9200 FAX: (425) 420.9210

| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8I17005** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8I17005-BLK1)** | | | | | | | **Extracted: 09/17/08 07:35** | | | | | | | |
| Ethylbenzene | EPA 8260B | ND | --- | 0.100 | mg/kg wet | 1x | -- | -- | -- | -- | -- | -- | 09/17/08 13:13 | |
| Hexachlorobutadiene | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methyl tert-butyl ether | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Hexane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Hexanone | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Isopropylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| p-Isopropyltoluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 4-Methyl-2-pentanone | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Naphthalene | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | C |
| n-Propylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Styrene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,3-Trichlorobenzene | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,4-Trichlorobenzene | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Toluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,3-Trichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,4-Trimethylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3,5-Trimethylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| o-Xylene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| m,p-Xylene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Total Xylenes | " | ND | --- | 0.300 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 94.1%* | | | *Limits: 75-125%* | " | | | | | | | *09/17/08 13:13* | |
| *Toluene-d8* | | *105%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *101%* | | | *75-125%* | " | | | | | | | " | |

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8I17005** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8I17005-BLK2)** | | | | | | | | **Extracted: 09/17/08 07:35** | | | | | | |
| Acetone | EPA 8260B | ND | --- | 5.00 | mg/kg wet | 1x | -- | -- | -- | -- | -- | -- | 09/19/08 09:25 | |
| Benzene | " | ND | --- | 0.0200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromochloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromodichloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromoform | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Bromomethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Butanone | " | ND | --- | 5.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Butylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| sec-Butylbenzene | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| tert-Butylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon disulfide | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Carbon tetrachloride | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1-Chlorohexane | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloroform | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Chloromethane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Chlorotoluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 4-Chlorotoluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromochloromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dibromo-3-chloropropane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dibromoethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dibromomethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,4-Dichlorobenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Dichlorodifluoromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,2-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,2-Dichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2,2-Dichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| cis-1,3-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| trans-1,3-Dichloropropene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |

TestAmerica Seattle

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8I17005** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Blank (8I17005-BLK2)** | | | | | | | **Extracted: 09/17/08 07:35** | | | | | | | |
| Ethylbenzene | EPA 8260B | ND | --- | 0.100 | mg/kg wet | 1x | -- | -- | -- | -- | -- | -- | 09/19/08 09:25 | |
| Hexachlorobutadiene | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methyl tert-butyl ether | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Hexane | " | ND | --- | 0.500 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 2-Hexanone | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Isopropylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| p-Isopropyltoluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 4-Methyl-2-pentanone | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Methylene chloride | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Naphthalene | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| n-Propylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Styrene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,3-Trichlorobenzene | " | ND | --- | 2.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,4-Trichlorobenzene | " | ND | --- | 1.00 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1,2-Tetrachloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2,2-Tetrachloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Tetrachloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Toluene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,1-Trichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,1,2-Trichloroethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichloroethene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Trichlorofluoromethane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,3-Trichloropropane | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,2,4-Trimethylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| 1,3,5-Trimethylbenzene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Vinyl chloride | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| o-Xylene | " | ND | --- | 0.100 | " | " | -- | -- | -- | -- | -- | -- | " | |
| m,p-Xylene | " | ND | --- | 0.200 | " | " | -- | -- | -- | -- | -- | -- | " | |
| Total Xylenes | " | ND | --- | 0.300 | " | " | -- | -- | -- | -- | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 92.6%* | | | *Limits: 75-125%* | " | | | | | | | *09/19/08 09:25* | |
| *Toluene-d8* | | *101%* | | | *75-125%* | " | | | | | | | *"* | |
| *4-BFB* | | *99.8%* | | | *75-125%* | " | | | | | | | *"* | |

TestAmerica Seattle

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Volatile Organic Compounds by EPA Method 8260B - Laboratory Quality Control Results

TestAmerica Seattle

**QC Batch: 8I17005** **Soil Preparation Method: EPA 5030B**

| Analyte | Method | Result | MDL* | MRL | Units | Dil | Source Result | Spike Amt | % REC | (Limits) | % RPD | (Limits) | Analyzed | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **LCS (8I17005-BS1)** | | | | | | | | | **Extracted: 09/17/08 07:35** | | | | | |
| Acetone | EPA 8260B | 30.1 | --- | 5.00 | mg/kg wet | 1x | -- | 40.0 | 75.3% | (60-130) | -- | -- | 09/17/08 09:47 | |
| Benzene | " | 3.80 | --- | 0.0200 | " | " | -- | 4.00 | 95.0% | (75-125) | -- | -- | 09/17/08 11:34 | |
| Chlorobenzene | " | 4.30 | --- | 0.100 | " | " | -- | " | 108% | " | -- | -- | " | |
| 1,1-Dichloroethene | " | 3.92 | --- | 0.100 | " | " | -- | " | 97.9% | (70-130) | -- | -- | " | |
| Methyl tert-butyl ether | " | 3.59 | --- | 0.500 | " | " | -- | " | 89.8% | (75-125) | -- | -- | " | |
| Toluene | " | 4.14 | --- | 0.100 | " | " | -- | " | 103% | " | -- | -- | " | |
| Trichloroethene | " | 3.98 | --- | 0.100 | " | " | -- | " | 99.4% | " | -- | -- | " | |
| Total Xylenes | " | 13.7 | --- | 0.300 | " | " | -- | 12.0 | 114% | " | -- | -- | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 97.6%* | | | *Limits: 75-125%* | " | | | | | | | *09/17/08 11:34* | |
| *Toluene-d8* | | *103%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *102%* | | | *75-125%* | " | | | | | | | " | |
| **LCS Dup (8I17005-BSD1)** | | | | | | | | | **Extracted: 09/17/08 07:35** | | | | | |
| Acetone | EPA 8260B | 32.8 | --- | 5.00 | mg/kg wet | 1x | -- | 40.0 | 81.9% | (70-130) | 8.40% | (20) | 09/17/08 10:13 | |
| Benzene | " | 3.70 | --- | 0.0200 | " | " | -- | 4.00 | 92.4% | (75-125) | 2.80% | " | 09/17/08 12:01 | |
| Chlorobenzene | " | 4.09 | --- | 0.100 | " | " | -- | " | 102% | " | 4.93% | " | " | |
| 1,1-Dichloroethene | " | 3.78 | --- | 0.100 | " | " | -- | " | 94.5% | (70-130) | 3.53% | " | " | |
| Methyl tert-butyl ether | " | 3.60 | --- | 0.500 | " | " | -- | " | 90.0% | (75-125) | 0.223% | " | " | |
| Toluene | " | 3.89 | --- | 0.100 | " | " | -- | " | 97.2% | " | 6.13% | " | " | |
| Trichloroethene | " | 3.85 | --- | 0.100 | " | " | -- | " | 96.2% | " | 3.25% | " | " | |
| Total Xylenes | " | 13.0 | --- | 0.300 | " | " | -- | 12.0 | 108% | " | 5.39% | " | " | |
| *Surrogate(s): 1,2-DCA-d4* | | *Recovery: 100%* | | | *Limits: 75-125%* | " | | | | | | | *09/17/08 12:01* | |
| *Toluene-d8* | | *99.3%* | | | *75-125%* | " | | | | | | | " | |
| *4-BFB* | | *101%* | | | *75-125%* | " | | | | | | | " | |

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| | | | |
|---|---|---|---|
| **Nortech** | Project Name: | **08-1082** | |
| 2400 College Road | Project Number: | [none] | Report Created: |
| Fairbanks, AK 99709 | Project Manager: | Ron Pratt | 09/19/08 14:33 |

## Notes and Definitions

Report Specific Notes:

| | | |
|---|---|---|
| C | - | Calibration Verification recovery was above the method control limit for this analyte. Analyte not detected, data not impacted. |
| C4 | - | Calibration Verification recovery was below the method control limit for this analyte. |
| C5 | - | Calibration Verification recovery was below the method control limit for this analyte. An additional check standard was analyzed at the reporting limit to ensure instrument sensitivity at the reporting limit. Samples ND. |
| C8 | - | Calibration Verification recovery was above the method control limit for this analyte. A high bias may be indicated. |

Laboratory Reporting Conventions:

| | | |
|---|---|---|
| DET | - | Analyte DETECTED at or above the Reporting Limit. Qualitative Analyses only. |
| ND | - | Analyte NOT DETECTED at or above the reporting limit (MDL or MRL, as appropriate). |
| NR/NA | - | Not Reported / Not Available |
| dry | - | Sample results reported on a Dry Weight Basis. Results and Reporting Limits have been corrected for Percent Dry Weight. |
| wet | - | Sample results and reporting limits reported on a Wet Weight Basis (as received). Results with neither 'wet' nor 'dry' are reported on a Wet Weight Basis. |
| RPD | - | RELATIVE PERCENT DIFFERENCE (RPDs calculated using Results, not Percent Recoveries). |
| MRL | - | METHOD REPORTING LIMIT. Reporting Level at, or above, the lowest level standard of the Calibration Table. |
| MDL* | - | METHOD DETECTION LIMIT. Reporting Level at, or above, the statistically derived limit based on 40CFR, Part 136, Appendix B. *MDLs are listed on the report only if the data has been evaluated below the MRL. Results between the MDL and MRL are reported as Estimated Results. |
| Dil | - | Dilutions are calculated based on deviations from the standard dilution performed for an analysis, and may not represent the dilution found on the analytical raw data. |
| Reporting Limits | - | Reporting limits (MDLs and MRLs) are adjusted based on variations in sample preparation amounts, analytical dilutions and percent solids, where applicable. |
| Electronic Signature | - | Electronic Signature added in accordance with TestAmerica's *Electronic Reporting and Electronic Signatures Policy.* Application of electronic signature indicates that the report has been reviewed and approved for release by the laboratory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature. |

TestAmerica Seattle

Curtis D. Armstrong, Project Manager

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING


11720 North Creek Pkwy N Suite 400, Bothell, WA 98011-8244 425-420-9200 FAX 420-9210
11922 E. First Ave, Spokane, WA 99206-5302 509-924-9200 FAX 924-9290
9405 SW Nimbus Ave,Beaverton, OR 97008-7145 503-906-9200 FAX 906-9210
2000 W International Airport Rd Ste A10, Anchorage, AK 99502-1119 907-563-9200 FAX 563-9210


# CHAIN OF CUSTODY REPORT

**Work Order #:** BRI0251

CLIENT: Nortech

REPORT TO: Ron Pratt
ADDRESS: 2400 College Rd
Fairbanks, AK
PHONE: 452 5688 FAX: 907 452 5694

INVOICE TO: Nortech
2400 College Rd
Fairbanks, AK
99709

P.O. NUMBER: 08 1082

PROJECT NAME: 08-1082
PROJECT NUMBER:
SAMPLED BY: RJP

**TURNAROUND REQUEST** in Business Days *

Organic & Inorganic Analyses: 10 STD. | 7 | 5 | 4 | 3 | (2) | 1 | <1

Petroleum Hydrocarbon Analyses: 5 STD. | 4 | 3 | 2 | 1 | <1

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

| | CLIENT SAMPLE IDENTIFICATION | SAMPLING DATE/TIME | PRESERVATIVE: MeOH | REQUESTED ANALYSES: VOC 8260 | MATRIX (W, S, O) | # OF CONT. | LOCATION/ COMMENTS | TA WO ID |
|---|---|---|---|---|---|---|---|---|
| 1 | S1 | 9/15/08 1800 | | X | | | | -01 |
| 2 | S2 | 9/15/08 1810 | | X | | | | -02 |
| 3 | S3 | 9/15/08 1820 | | X | | | | -03 |
| 4 | TB | | | X | | | | -04 |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |

RELEASED BY: Ronald J. Pratt — DATE: 9/15/08
PRINT NAME: Ronald J. Pratt — FIRM: Nortech — TIME: 1915

RECEIVED BY: — DATE: 9/16/08
PRINT NAME: Francisco Luna, Jr — FIRM: TA-SEA — TIME: 1645

RELEASED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

RECEIVED BY: — DATE:
PRINT NAME: — FIRM: — TIME:

ADDITIONAL REMARKS: w/cs

TEMP: 0.2 °C

PAGE OF

TAL-1000(0408)

TAT: _____ Paperwork to PM – Date:_____ Time:_____ Non-Conformances?

Page Time & Initials:_____ Circle Y or N

(If Y, see other side)

# TEST AMERICA SAMPLE RECEIPT CHECKLIST

| **Received By:** (applies to temp at receipt) | **Logged-in By:** | **Unpacked/Labeled By:** | ***Cooler ID:*** _____ |
|---|---|---|---|
| Date: 9/16/08 | Date: 09.16 | Date: 9-16-08 | Work Order No. BRI0251 |
| Time: 1645 | Time: 1657 | Time: 1715 | Client: Nortech |
| Initials: FL. | Initials: CW | Initials: DSH | Project: _____ |

Container Type:
- X Cooler
- ____ Box
- ____ None/Other _____

COC Seals:
- X Ship Container
- ____ On Bottles
- ____ None

? Sign By

4/5/08 Date

Packing Material _____:
- ____ Bubble Bags
- X Styrofoam
- ____ Foam Packs
- X None/Other Box, Bubble wrap

Refrigerant:
- X Gel Ice Pack _____
- ____ Loose Ice _____
- ____ None/Other _____

Received Via: Bill#_____
- ____ Fed Ex
- ____ Client
- ____ UPS
- X TA Courier
- ____ DHL
- ____ Mid Valley
- ____ Senvoy
- ____ TDP
- X GS
- ____ Other_____

Cooler Temperature (*IR*): ____°C Plastic Glass (Frozen filters, Tedlars and aqueous Metals exempt)
(circle one)

Temperature Blank? 0.2 °C or NA Trip Blank? Y or N or NA

BP, OPLC,ARCO-Temperature monitoring every 15 minutes:
(initial/date/time):_____
Comments:_____

| Sample Containers: | | ID | | | ID |
|---|---|---|---|---|---|
| Intact? | (Y) or N | _____ | Metals Preserved? | Y or N or (NA) | _____ |
| Provided by TA? | (Y) or N | _____ | Client QAPP Preserved? | Y or N or (NA) | _____ |
| Correct Type? | (Y) or N | _____ | Adequate Volume? (for tests requested) | (Y) or N | _____ |
| #Containers match COC? | (Y) or (N) | Not indicated | Water VOAs: Headspace? | Y or N or (NA) | _____ |
| IDs/time/date match COC? | (Y) or N | _____ | Comments: | | |
| Hold Times in hold? | (Y) or N | _____ | _____ | | |

**PROJECT MANAGEMENT**

Is the Chain of Custody complete? Y or N If N, circle the items that were incomplete

Comments,Problems_____

_____

_____

_____

Total access set up? Y or N

Has client been contacted regarding non-conformances? Y or N If Y, ____/____ (Date Time)

PM Initials: _____ Date: _____ Time: _____

(rev 4, 01/24/07)

# Laboratory Data Review Checklist

| | |
|---|---|
| Completed by: | Ronald J. Pratt |
| Title: | Environmental Scientist |
| Date: | October 20, 2008 |
| CS Report Name: | NC Machinery, Soil Characterization and Sampling Report |
| Report Date: | October 30, 2008 |
| Consultant Firm: | NORTECH |
| Laboratory Name: | SGS |
| Laboratory Report Number: | 1085923 |
| ADEC File Number: | |
| ADEC RecKey Number: | |

1. Laboratory

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

   ☒ Yes ☐ No Comments:

   yes

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

   ☐ Yes ☐ No Comments:

   Not applicable

2. Chain of Custody (COC)

   a. COC information completed, signed, and dated (including released/received by)?

   ☒ Yes ☐ No Comments:

   yes

b. Correct analyses requested?

☑ Yes ☐ No Comments:

yes

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (4° ± 2° C)?

☑ Yes ☐ No Comments:

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

☑ Yes ☐ No Comments:

yes

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

☑ Yes ☐ No Comments:

yes

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

☑ Yes ☐ No Comments:

Not applicable

e. Data quality or usability affected? Explain.

Comments:

Data quality/usability not affected

4. Case Narrative

a. Present and understandable?

☑ Yes ☐ No Comments:

yes

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

yes; one sample for AK102 analysis was diluted due to thick consistency and PQLs were elevated and the one sample analyzed for PAH contaminants had elevated PQLs due to matrix interference with internal standards

☒ Yes ☐ No Comments:

c. Were all corrective actions documented?

☒ Yes ☐ No Comments:

yes

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

Comments:

Data quality/usability not affected. Elevated AK102 analysis PQLs were below the cleanup levels for DRO contaminants, and all PAH PQL's were below cleanup levels with the exception of 1-methylnapthalene and 2-methylnapthalene, both of which were detected above the utilized PQL.

5. Samples Results

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

☒ Yes ☐ No Comments:

yes

b. All applicable holding times met?

☒ Yes ☐ No Comments:

yes

c. All soils reported on a dry weight basis?

☒ Yes ☐ No Comments:

not applicable

d. Are the reported PQLs less than the Cleanup Level or the minimum required detection level for the project?

☐ Yes ☒ No Comments:

PQLs for 1-methylnapthalene 2-methylnapthalene were above cleanup levels but each analyte was detected above the utilized PQL

e. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

6. QC Samples

a. Method Blank

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

☑ Yes ☐ No Comments:

yes

ii. All method blank results less than PQL?

☑ Yes ☐ No Comments:

yes

iii. If above PQL, what samples are affected?

Comments:

Not applicable

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

☑ Yes ☐ No Comments:

Not applicable

v. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

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

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples?

☑ Yes ☐ No Comments:

yes

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

☐ Yes ☐ No Comments:

Not applicable

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

☑ Yes ☐ No Comments:

yes

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

☑ Yes ☐ No Comments:

yes

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

Comments:

Not applicable

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

☑ Yes ☐ No Comments:

Not applicable

vii. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

c. Surrogates – Organics Only

i. Are surrogate recoveries reported for organic analyses – field, QC and laboratory samples?

☑ Yes ☐ No Comments:

yes

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs, if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages)

☐ Yes ☑ No Comments:

no

iii. Do the sample results with failed surrogate recoveries have data flags? If so, are the data flags clearly defined?

☑ Yes ☐ No Comments:

not applicable

iv. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

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

i. One trip blank reported per matrix, analysis and cooler?

☑ Yes ☐ No Comments:

yes

ii. All results less than PQL?

☑ Yes ☐ No Comments:

yes

iii. If above PQL, what samples are affected?

Comments:

Not applicable

iv. Data quality or usability affected? Explain.

Comments:

data quality/usability not affected

e. Field Duplicate

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

☑ Yes ☐ No Comments:

yes

ii. Submitted blind to lab?

☑ Yes ☐ No Comments:

yes

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

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

Where $R_1$ = Sample Concentration
$R_2$ = Field Duplicate Concentration

☑ Yes ☐ No Comments:

yes

iv. Data quality or usability affected? Explain.

Comments:

| |
|---|
| data quality/usability not affected |

f. Decontamination or Equipment Blank (if applicable)

☐ Yes ☐ No ☐ Not Applicable

i. All results less than PQL?

☐ Yes ☐ No Comments:

| |
|---|
| Not applicable |

ii. If above PQL, what samples are affected?

Comments:

| |
|---|
| Not applicable |

iii. Data quality or usability affected? Explain.

Comments:

| |
|---|
| Not applicable |

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

a. Defined and appropriate?

☐ Yes ☐ No Comments:

| |
|---|
| Not applicable |

**SGS Environmental Services**
**Alaska Division**
**Level II Laboratory Data Report**

| | |
|---|---|
| Project: | N.C. 081082 |
| Client: | Nortech |
| SGS Work Order: | 1085923 |

Released by: Stephen C. Ede 2008.10.20 13:28:34 -08'00'

Alaska Division Technical Director

**Contents:**



**Note:**
Unless otherwise noted, all quality assurance/quality control criteria is in compliance with the standards set forth by the proper regulatory authority, the SGS Quality Assurance Program Plan, and the National Environmental Accreditation Conference.

## Case Narrative

| | | | | | |
|---|---|---|---|---|---|
| **Client** | NORTECH | Nortech | **Printed Date/Time** | 10/20/2008 | 13:11 |
| **Workorder** | 1085923 | N.C. 081082 | | | |

**Sample ID** **Client Sample ID**

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

**1085923001** **PS** **EX 1**

AK102 - The sample was diluted due to the thick consistency; therefore, the PQLs are elevated.

**1085923008** **PS** **SB 1**

8270D SIMS - Elevated PQL due to matrix interference with internal standards.

# Laboratory Analysis Report

200 W. Potter Drive
Anchorage, AK 99518-1605
Tel: (907) 562-2343
Fax: (907) 561-5301
Web: http://www.us.sgs.com

Peter Beardsley
Nortech
2400 College Rd.
Fairbanks, AK 99709

**Work Order:** 1085923
N.C. 081082

**Client:** Nortech

**Report Date:** October 20, 2008

**Released by:**
Alaska Division Technical Director
Stephen C. Ede
2008.10.20
13:28:54 -08'00'

Enclosed are the analytical results associated with the above workorder.

As required by the state of Alaska and the USEPA, a formal Quality Assurance/Quality Control Program is maintained by SGS. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request.

The laboratory certification numbers are AK971-05 (DW), UST-005 (CS) and AK00971 (Micro) for ADEC and AK100001 for NELAP (RCRA methods: 1020A, 1311, 6010B, 7470A, 7471A, 9040B, 9045C, 9056, 9060, 9065, 8015B, 8021B, 8081A/8082, 8260B, 8270C).

Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP, the National Environmental Laboratory Accreditation Program and, when applicable, other regulatory authorities.

If you have any questions regarding this report or if we can be of any other assistance, please contact your SGS Project Manager at 907-562-2343.

The following descriptors may be found on your report which will serve to further qualify the data.

| | |
|---|---|
| PQL | Practical Quantitation Limit (reporting limit). |
| U | Indicates the analyte was analyzed for but not detected. |
| F | Indicates value that is greater than or equal to the MDL. |
| J | The quantitation is an estimation. |
| ND | Indicates the analyte is not detected. |
| B | Indicates the analyte is found in a blank associated with the sample. |
| * | The analyte has exceeded allowable regulatory or control limits. |
| GT | Greater Than |
| D | The analyte concentration is the result of a dilution. |
| LT | Less Than |
| ! | Surrogate out of control limits. |
| Q | QC parameter out of acceptance range. |
| M | A matrix effect was present. |
| JL | The analyte was positively identified, but the quantitation is a low estimation. |
| E | The analyte result is above the calibrated range. |
| R | Rejected |

Note: Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content.

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923001 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 12:50 |
| **Client Sample ID** | EX 1 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

AK102 - The sample was diluted due to the thick consistency; therefore, the PQLs are elevated.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | 34.1 | 31.4 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | 172 | 125 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 125 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 125 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 125 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 88.6 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 109 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 58 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 71.8 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923002 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 12:55 |
| **Client Sample ID** | EX 2 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 16.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 65.8 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 65.8 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 65.8 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 65.8 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 89.6 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 21.8 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 61.7 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 90.3 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923003 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 13:00 |
| **Client Sample ID** | EX 3 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 18.1 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 72.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 72.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 72.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 72.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 89.7 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 21.7 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 64.7 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 90.0 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923004 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 13:05 |
| **Client Sample ID** | EX 4 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 12.3 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 49.4 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 49.4 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 49.4 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 49.4 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 89.8 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 22.6 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 68.3 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 88.1 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923005 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 13:15 |
| **Client Sample ID** | EX 5 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 14.7 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 59.0 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 59.0 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 59.0 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 59.0 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 90.3 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 22.8 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 70.7 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 86.2 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923006 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 13:20 |
| **Client Sample ID** | EX 6 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 18.3 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 73.3 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 73.3 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 73.3 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 73.3 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 90.9 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 23.4 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 65 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 85.4 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923007 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 13:30 |
| **Client Sample ID** | EX 7 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 17.4 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 69.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 69.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 69.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 69.5 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 90.9 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |
| **Semivolatile Organic Fuels Department** | | | | | | | | | |
| Diesel Range Organics | ND | 24.0 | mg/Kg | AK102 | B | | 10/10/08 | 10/14/08 | GL |
| **Surrogates** | | | | | | | | | |
| 5a Androstane <surr> | 61.6 | | % | AK102 | B | 50-150 | 10/10/08 | 10/14/08 | GL |
| **Solids** | | | | | | | | | |
| Total Solids | 83.3 | | % | SM20 2540G | B | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923008 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 15:20 |
| **Client Sample ID** | SB 1 | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Soil/Solid (dry weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

8270D SIMS - Elevated PQL due to matrix interference with internal standards.

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatics GC/MS** | | | | | | | | | |
| Acenaphthylene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Acenaphthene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Fluorene | 4140 | 1350 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Phenanthrene | 3360 | 1350 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Anthracene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Fluoranthene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Pyrene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Benzo(a)Anthracene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Chrysene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Benzo[b]Fluoranthene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Benzo[k]fluoranthene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Benzo[a]pyrene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Indeno[1,2,3-c,d] pyrene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Dibenzo[a,h]anthracene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Benzo[g,h,i]perylene | ND | 135 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| Naphthalene | 27600 | 1350 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| 1-Methylnaphthalene | 84400 | 13500 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| 2-Methylnaphthalene | 102000 | 13500 | ug/Kg | 8270D SIMS | A | | 10/10/08 | 10/15/08 | JDH |
| **Surrogates** | | | | | | | | | |
| Terphenyl-d14 <surr> | 113 | | % | 8270D SIMS | A | 30-125 | 10/10/08 | 10/15/08 | JDH |
| **Solids** | | | | | | | | | |
| Total Solids | 73.3 | | % | SM20 2540G | A | | | 10/08/08 | STB |

| | | | |
|---|---|---|---|
| **SGS Ref.#** | 1085923009 | | |
| **Client Name** | Nortech | **Printed Date/Time** | 10/20/2008 13:11 |
| **Project Name/#** | N.C. 081082 | **Collected Date/Time** | 09/26/2008 12:50 |
| **Client Sample ID** | TB | **Received Date/Time** | 09/27/2008 11:10 |
| **Matrix** | Solid/Soil (Wet Weight) | **Technical Director** | **Stephen C. Ede** |

Sample Remarks:

| Parameter | Results | PQL | Units | Method | Container ID | Allowable Limits | Prep Date | Analysis Date | Init |
|---|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | | |
| Benzene | ND | 12.7 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Toluene | ND | 50.6 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| Ethylbenzene | ND | 50.6 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| o-Xylene | ND | 50.6 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| P & M -Xylene | ND | 50.6 | ug/Kg | SW8021B | A | | 09/26/08 | 10/01/08 | HM |
| **Surrogates** | | | | | | | | | |
| 1,4-Difluorobenzene <surr> | 90.5 | | % | SW8021B | A | 80-120 | 09/26/08 | 10/01/08 | HM |

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 862006 | Method Blank | **Printed Date/Time** | | 10/20/2008 13:11 |
| **Client Name** | Nortech | | **Prep** | **Batch** | VXX18817 |
| **Project Name/#** | N.C. 081082 | | | **Method** | SW5035A |
| **Matrix** | Soil/Solid (dry weight) | | | **Date** | 10/01/2008 |

QC results affect the following production samples:

1085923001, 1085923002, 1085923003, 1085923004, 1085923005, 1085923006, 1085923007, 1085923009

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | |
| Benzene | ND | 12.5 | 4.00 | ug/Kg | 10/01/08 |
| Toluene | ND | 50.0 | 15.0 | ug/Kg | 10/01/08 |
| Ethylbenzene | ND | 50.0 | 15.0 | ug/Kg | 10/01/08 |
| o-Xylene | ND | 50.0 | 15.0 | ug/Kg | 10/01/08 |
| P & M -Xylene | ND | 50.0 | 15.0 | ug/Kg | 10/01/08 |
| **Surrogates** | | | | | |
| 1,4-Difluorobenzene <surr> | 88.3 | 80-120 | | % | 10/01/08 |

**Batch** VFC9190
**Method** SW8021B
**Instrument** HP 5890 Series II PID+FID VCA

| | | | | |
|---|---|---|---|---|
| **SGS Ref.#** | 863179 | Method Blank | **Printed Date/Time** | 10/20/2008 13:11 |
| **Client Name** | Nortech | | **Prep Batch** | |
| **Project Name/#** | N.C. 081082 | | **Method** | |
| **Matrix** | Soil/Solid (dry weight) | | **Date** | |

QC results affect the following production samples:

1085923001, 1085923002, 1085923003, 1085923004, 1085923005, 1085923006, 1085923007, 1085923008

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|---|---|---|---|---|
| **Solids** | | | | | |
| Total Solids | 100 | | | % | 10/08/08 |
| **Batch** SPT7832 | | | | | |
| **Method** SM20 2540G | | | | | |
| **Instrument** | | | | | |

| | | | | |
|---|---|---|---|---|
| **SGS Ref.#** | 863804 | Method Blank | **Printed Date/Time** | 10/20/2008 13:11 |
| **Client Name** | Nortech | | **Prep Batch** | XXX20183 |
| **Project Name/#** | N.C. 081082 | | **Method** | SW3550C |
| **Matrix** | Soil/Solid (dry weight) | | **Date** | 10/10/2008 |

QC results affect the following production samples:

1085923008

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|---|---|---|---|---|
| **Polynuclear Aromatics GC/MS** | | | | | |
| Acenaphthylene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Acenaphthene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Fluorene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Phenanthrene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Anthracene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Fluoranthene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Pyrene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Benzo(a)Anthracene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Chrysene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Benzo[b]Fluoranthene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Benzo[k]fluoranthene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Benzo[a]pyrene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Indeno[1,2,3-c,d] pyrene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Dibenzo[a,h]anthracene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Benzo[g,h,i]perylene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| Naphthalene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| 1-Methylnaphthalene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| 2-Methylnaphthalene | ND | 5.00 | 1.50 | ug/Kg | 10/12/08 |
| **Surrogates** | | | | | |
| Terphenyl-d14 <surr> | 95.7 | 30-125 | | % | 10/12/08 |

| | |
|---|---|
| **Batch** | XMS4731 |
| **Method** | 8270D SIMS |
| **Instrument** | HP 6890/5973 MS SVOA |

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863837 | Method Blank | **Printed Date/Time** | | 10/20/2008 13:11 |
| **Client Name** | Nortech | | **Prep** | **Batch** | XXX20186 |
| **Project Name/#** | N.C. 081082 | | | **Method** | SW3550C |
| **Matrix** | Soil/Solid (dry weight) | | | **Date** | 10/10/2008 |

QC results affect the following production samples:

1085923001, 1085923002, 1085923003, 1085923004, 1085923005, 1085923006, 1085923007

| Parameter | Results | Reporting/Control Limit | MDL | Units | Analysis Date |
|---|---|---|---|---|---|
| **Semivolatile Organic Fuels Department** | | | | | |
| Diesel Range Organics | ND | 20.0 | 2.00 | mg/Kg | 10/14/08 |
| **Surrogates** | | | | | |
| 5a Androstane <surr> | 82.7 | 60-120 | | % | 10/14/08 |

**Batch** XFC8269
**Method** AK102
**Instrument** HP 5890 Series II FID SV D F

| | | | | |
|---|---|---|---|---|
| **SGS Ref.#** | 863180 | Duplicate | **Printed Date/Time** | 10/20/2008 13:11 |
| **Client Name** | Nortech | | **Prep Batch** | |
| **Project Name/#** | N.C. 081082 | | **Method** | |
| **Original** | 1085962002 | | **Date** | |
| **Matrix** | Soil/Solid (dry weight) | | | |

QC results affect the following production samples:

1085923001, 1085923002, 1085923003, 1085923004, 1085923005, 1085923006, 1085923007, 1085923008

| Parameter | Original Result | QC Result | Units | RPD | RPD Limits | Analysis Date |
|---|---|---|---|---|---|---|
| **Solids** | | | | | | |
| Total Solids | 89.9 | 89.7 | % | 0 | (< 15 ) | 10/08/2008 |

**Batch** SPT7832
**Method** SM20 2540G
**Instrument**

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 862007 | Lab Control Sample | **Printed Date/Time** | 10/20/2008 | 13:11 |
| | 862008 | Lab Control Sample Duplicate | **Prep Batch** | VXX18817 | |
| **Client Name** | Nortech | | **Method** | SW5035A | |
| **Project Name/#** | N.C. 081082 | | **Date** | 10/01/2008 | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

QC results affect the following production samples:

1085923001, 1085923002, 1085923003, 1085923004, 1085923005, 1085923006, 1085923007, 1085923009

| Parameter | | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| **Volatile Fuels Department** | | | | | | | | |
| Benzene | LCS | 1240 | 100 | ( 80-125 ) | | | 1250 ug/Kg | 10/01/2008 |
| | LCSD | 1260 | 101 | | 1 | (< 20 ) | 1250 ug/Kg | 10/01/2008 |
| Toluene | LCS | 1370 | 110 | ( 85-120 ) | | | 1250 ug/Kg | 10/01/2008 |
| | LCSD | 1390 | 111 | | 1 | (< 20 ) | 1250 ug/Kg | 10/01/2008 |
| Ethylbenzene | LCS | 1420 | 113 | ( 85-125 ) | | | 1250 ug/Kg | 10/01/2008 |
| | LCSD | 1440 | 115 | | 2 | (< 20 ) | 1250 ug/Kg | 10/01/2008 |
| o-Xylene | LCS | 1340 | 107 | ( 85-125 ) | | | 1250 ug/Kg | 10/01/2008 |
| | LCSD | 1360 | 109 | | 1 | (< 20 ) | 1250 ug/Kg | 10/01/2008 |
| P & M -Xylene | LCS | 2860 | 114 | ( 85-125 ) | | | 2500 ug/Kg | 10/01/2008 |
| | LCSD | 2910 | 116 | | 2 | (< 20 ) | 2500 ug/Kg | 10/01/2008 |
| **Surrogates** | | | | | | | | |
| 1,4-Difluorobenzene <surr> | LCS | | 95 | ( 80-120 ) | | | | 10/01/2008 |
| | LCSD | | 95 | | 0 | | | 10/01/2008 |

| | |
|---|---|
| **Batch** | VFC9190 |
| **Method** | SW8021B |
| **Instrument** | HP 5890 Series II PID+FID VCA |

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863805 | Lab Control Sample | **Printed Date/Time** | 10/20/2008 | 13:11 |
| | | | **Prep Batch** | XXX20183 | |
| **Client Name** | Nortech | | **Method** | SW3550C | |
| **Project Name/#** | N.C. 081082 | | **Date** | 10/10/2008 | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

QC results affect the following production samples:

1085923008

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|---|---|---|---|---|---|---|

**Polynuclear Aromatics GC/MS**

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863805 | Lab Control Sample | **Printed Date/Time** | 10/20/2008 | 13:11 |
| | | | **Prep Batch** | XXX20183 | |
| **Client Name** | Nortech | | **Method** | SW3550C | |
| **Project Name/#** | N.C. 081082 | | **Date** | 10/10/2008 | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

| Parameter | | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatics GC/MS** | | | | | | | | |
| Acenaphthylene | LCS | 14.4 | 65 | ( 45-102 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Acenaphthene | LCS | 13.9 | 63 | ( 45-99 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Fluorene | LCS | 15.0 | 67 | ( 50-107 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Phenanthrene | LCS | 16.1 | 73 | ( 50-110 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Anthracene | LCS | 14.3 | 64 | ( 28-103 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Fluoranthene | LCS | 17.9 | 81 | ( 55-115 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Pyrene | LCS | 17.1 | 77 | ( 45-120 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Benzo(a)Anthracene | LCS | 17.3 | 78 | ( 40-110 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Chrysene | LCS | 16.4 | 74 | ( 55-110 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Benzo[b]Fluoranthene | LCS | 16.4 | 74 | ( 45-115 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Benzo[k]fluoranthene | LCS | 17.1 | 77 | ( 45-120 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Benzo[a]pyrene | LCS | 13.7 | 62 | ( 10-102 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Indeno[1,2,3-c,d] pyrene | LCS | 15.5 | 70 | ( 40-120 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Dibenzo[a,h]anthracene | LCS | 15.5 | 70 | ( 40-125 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Benzo[g,h,i]perylene | LCS | 15.2 | 68 | ( 40-118 ) | | | 22.2 ug/Kg | 10/12/2008 |
| Naphthalene | LCS | 13.8 | 62 | ( 40-92 ) | | | 22.2 ug/Kg | 10/12/2008 |
| 1-Methylnaphthalene | LCS | 13.5 | 61 | ( 30-97 ) | | | 22.2 ug/Kg | 10/12/2008 |
| 2-Methylnaphthalene | LCS | 13.3 | 60 | ( 45-96 ) | | | 22.2 ug/Kg | 10/12/2008 |
| **Surrogates** | | | | | | | | |
| Terphenyl-d14 <surr> | LCS | | 97 | ( 30-125 ) | | | | 10/12/2008 |

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863805 | Lab Control Sample | **Printed Date/Time** | 10/20/2008 | 13:11 |
| | | | **Prep Batch** | XXX20183 | |
| **Client Name** | Nortech | | **Method** | SW3550C | |
| **Project Name/#** | N.C. 081082 | | **Date** | 10/10/2008 | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

| Parameter | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|---|---|---|---|---|---|---|

**Polynuclear Aromatics GC/MS**

| | |
|---|---|
| **Batch** | XMS4731 |
| **Method** | 8270D SIMS |
| **Instrument** | HP 6890/5973 MS SVOA |

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863838 | Lab Control Sample | **Printed Date/Time** | 10/20/2008 | 13:11 |
| | 863839 | Lab Control Sample Duplicate | **Prep Batch** | XXX20186 | |
| **Client Name** | Nortech | | **Method** | SW3550C | |
| **Project Name/#** | N.C. 081082 | | **Date** | 10/10/2008 | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

QC results affect the following production samples:

1085923001, 1085923002, 1085923003, 1085923004, 1085923005, 1085923006, 1085923007

| Parameter | | QC Results | Pct Recov | LCS/LCSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|---|---|---|---|---|---|---|---|
| **Semivolatile Organic Fuels Department** | | | | | | | | |
| Diesel Range Organics | LCS | 142 | 86 | ( 75-125 ) | | | 167 mg/Kg | 10/14/2008 |
| | LCSD | 145 | 87 | | 2 | (< 20 ) | 167 mg/Kg | 10/14/2008 |
| **Surrogates** | | | | | | | | |
| 5a Androstane <surr> | LCS | | 82 | ( 60-120 ) | | | | 10/14/2008 |
| | LCSD | | 83 | | 1 | | | 10/14/2008 |

**Batch** XFC8269
**Method** AK102
**Instrument** HP 5890 Series II FID SV D F

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863806 | Matrix Spike | **Printed Date/Time** | | 10/20/2008 13:11 |
| | 863807 | Matrix Spike Duplicate | **Prep** | **Batch** | XXX20183 |
| | | | | **Method** | Sonication Extraction Soil 8270 |
| | | | | **Date** | 10/10/2008 |
| **Original** | 1085926008 | | | | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

QC results affect the following production samples:

1085923008

| Parameter | Qualifiers | | Original Result | QC Result | Pct Recov | MS/MSD Limits | RPD | RPD Limits | Spiked Amount | | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatics GC/MS** | | | | | | | | | | | |
| Acenaphthylene | MS | | ND | 15.0 | 65 | ( 45-102 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 14.9 | 65 | | 1 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Acenaphthene | MS | | ND | 14.6 | 63 | ( 45-99 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 14.8 | 64 | | 1 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Fluorene | MS | | ND | 15.9 | 69 | ( 50-107 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 15.5 | 67 | | 2 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Phenanthrene | MS | | ND | 16.0 | 70 | ( 50-110 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 15.5 | 67 | | 4 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Anthracene | MS | | ND | 14.7 | 64 | ( 28-103 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 14.1 | 61 | | 5 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Fluoranthene | MS | | ND | 19.0 | 82 | ( 55-115 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 18.1 | 78 | | 5 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Pyrene | MS | | ND | 18.5 | 80 | ( 45-120 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 17.5 | 76 | | 5 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Benzo(a)Anthracene | MS | | ND | 18.8 | 82 | ( 40-110 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 18.1 | 78 | | 4 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Chrysene | MS | | ND | 17.1 | 74 | ( 55-110 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 16.7 | 72 | | 3 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Benzo[b]Fluoranthene | MS | | ND | 17.3 | 75 | ( 45-115 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 16.8 | 73 | | 3 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Benzo[k]fluoranthene | MS | | ND | 18.1 | 78 | ( 45-120 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 17.7 | 77 | | 2 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Benzo[a]pyrene | MS | | ND | 15.0 | 65 | ( 10-102 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 15.3 | 66 | | 2 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Indeno[1,2,3-c,d] pyrene | MS | | ND | 15.8 | 69 | ( 40-120 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 15.8 | 69 | | 0 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Dibenzo[a,h]anthracene | MS | | ND | 15.7 | 68 | ( 40-125 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 15.5 | 67 | | 1 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Benzo[g,h,i]perylene | MS | | ND | 16.0 | 70 | ( 40-118 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 16.1 | 70 | | 1 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| Naphthalene | MS | | ND | 12.5 | 54 | ( 40-92 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 13.2 | 58 | | 6 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| 1-Methylnaphthalene | MS | | ND | 13.1 | 57 | ( 30-97 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 13.7 | 59 | | 5 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |
| 2-Methylnaphthalene | MS | | ND | 12.7 | 55 | ( 45-96 ) | | | 23.1 | ug/Kg | 10/12/2008 |
| | MSD | | | 13.2 | 57 | | 4 | (< 30 ) | 23.1 | ug/Kg | 10/12/2008 |

**Surrogates**

| | | | | | |
|---|---|---|---|---|---|
| **SGS Ref.#** | 863806 | Matrix Spike | **Printed Date/Time** | | 10/20/2008 13:11 |
| | 863807 | Matrix Spike Duplicate | **Prep** | **Batch** | XXX20183 |
| | | | | **Method** | Sonication Extraction Soil 8270 |
| | | | | **Date** | 10/10/2008 |
| **Original** | 1085926008 | | | | |
| **Matrix** | Soil/Solid (dry weight) | | | | |

| Parameter | Qualifiers | Original Result | QC Result | Pct Recov | MS/MSD Limits | RPD | RPD Limits | Spiked Amount | Analysis Date |
|---|---|---|---|---|---|---|---|---|---|
| **Polynuclear Aromatics GC/MS** | | | | | | | | | |
| Terphenyl-d14 <surr> | MS | | 22.8 | 99 | ( 30-125 ) | | | | 10/12/2008 |
| | MSD | | 21.8 | 95 | | 4 | | | 10/12/2008 |

| | |
|---|---|
| **Batch** | XMS4731 |
| **Method** | 8270D SIMS |
| **Instrument** | HP 6890/5973 MS SVOA |

SGS 1085923

# CHAIN OF CUSTODY RECORD
## SGS Environmental Services Inc.

Locations Nationwide
- Alaska
- Hawaii
- Ohio
- Maryland
- New Jersey
- North Carolina
- West Virginia

www.us.sgs.com

086169

(1)

CLIENT: NORTECH
CONTACT: Peter Beardsley PHONE NO:(907) 452 5688
PROJECT: N.C. 081082 SITE/PWSID# :
REPORTS TO: NORTECH E-MAIL:
FAX NO.:(907) 452-5694
INVOICE TO: NORTECH 2400 College Rd Fairbanks, AK QUOTE #
P.O. NUMBER

SGS Reference:

PAGE 1 OF 1

(2)

| LAB NO. | SAMPLE IDENTIFICATION | DATE | TIME | MATRIX | No CONTAINERS | SAMPLE TYPE (C=COMP G=GRAB) | Preservatives Used | Analysis Required (3) | | | | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | MeOH | BTEX | DRO AK102 | PAH 8270 SIMS | | | | | | | | |
| (1) A,B | Ex 1 | 9/26 | 1250 | S | 2 | G | | X | X | | | | | | | | | |
| (2) A,B | Ex 2 | 9/26 | 1255 | S | 2 | G | | X | X | | | | | | | | | |
| (3) A,B | Ex 3 | 9/26 | 1300 | S | 2 | G | | X | X | | | | | | | | | |
| (4) A,B | Ex 4 | 9/26 | 1305 | S | 2 | G | | X | X | | | | | | | | | |
| (5) A,B | Ex 5 | 9/26 | 1315 | S | 2 | G | | X | X | | | | | | | | | |
| (6) A,B | Ex 6 | 9/26 | 1320 | S | 2 | G | | X | X | | | | | | | | | |
| (7) A,B | Ex 7 | 9/26 | 1330 | S | 2 | G | | X | X | | | | | | | | | |
| (9) A | TB | | | | | | | X | | | | | | | | | | |
| (8) A | SB 1 | 9/26 | 1520 | S | 1 | G | | | | X | | | | | | | | |

(5)

| Collected/Relinquished By: (1) | Date | Time | Received By: | Date | Time |
|---|---|---|---|---|---|
| | 9/26/08 | 1620 | | | |
| Relinquished By: (2) Simon Beene | 9/26/08 | 1630 | Received By: | Date | Time |
| Relinquished By: (3) | Date | Time | Received By: | Date | Time |
| Relinquished By: (4) | Date | Time | Received By: | 9/27/08 | 1110 |

(4)

Shipping Carrier: FEDEX
Shipping Ticket No:
Samples Received Cold? (Circle) YES NO
Temperature °C: 4.9 / TB=2.3
Special Deliverable Requirements:
Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT
Special Instructions:
Requested Turnaround Time:
☐ RUSH _____ Date Needed ☐ STD

Page 28 of 29


☐ 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
☐ 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557
☐ 1270 Greenbrier Street Charleston, WV 25311 Tel: (304) 346-0725 Fax: (304) 346-0761


White - Retained by Lab
Yellow - Returned with Report
Pink - Retained by Sampler

SGS

1085923

## SAMPLE RECEIPT FORM

SGS WO#: _____

| Yes | No | NA | | |
|---|---|---|---|---|
| ___ | ✓ | ___ | Are samples **RUSH**, priority or *w/in 72 hrs* of **hold time**? | **TAT (circle one):** ~~Standard~~ -or- Rush |
| ___ | ___ | ✓ | If yes, have you done *e-mail ALERT notification*? | **Received Date:** 9/26/08 |
| ___ | ✓ | ___ | Are samples *within 24 hrs.* of **hold time** or **due date**? | **Received Time:** 1620 |
| ___ | ___ | ✓ | If yes, have you also *spoken with* supervisor? | Is **date/time conversion** necessary? NO |
| ___ | ✓ | ___ | Archiving bottles (if req'd): Are they properly marked? | # of hours to AK Local Time: NA |
| ___ | ___ | ✓ | Are there any **problems**? PM Notified? _____ | **Thermometer ID:** IRBXB |
| ___ | ___ | ✓ | Were samples preserved correctly and pH verified? | |

| Cooler ID | Temp Blank | Cooler Temp |
|---|---|---|
| 1 | 2.3 °C | 4.9 °C |
| | °C | °C |
| | °C | °C |
| | °C | °C |
| | °C | °C |

Note: Temperature readings include thermometer correction factors

| | | | | |
|---|---|---|---|---|
| | | | _____ | |
| | | | _____ | |
| | | | _____ | |
| ___ | ___ | ✓ | If this is for PWS, provide **PWSID.** _____ | |
| ___ | ___ | ✓ | Will courier charges apply? | |
| | | | Method of payment? _____ | |
| ___ | ✓ | ___ | Data package required? (Level: 1 / 2 / 3 / 4) | |
| | | | *Notes*: _____ | |
| ___ | ✓ | ___ | Is this a DoD project? (USACE, Navy, AFCEE) | |

**Delivery method** (circle all that apply): Client / Alert Courier / UPS / FedEx / USPS / DHL / AA Goldstreak / NAC / ERA / PenAir / Carlile/ Lynden / SGS / Other: _____

**Airbill #** _____

Additional Sample Remarks: (✓ *if applicable*)

_____ Extra Sample Volume?
_____ Limited Sample Volume?
✓ MeOH field preserved for volatiles?
_____ Field-filtered for dissolved_____
_____ Lab-filtered for dissolved_____
_____ Ref Lab required? _____
_____ Foreign Soil?

***This section must be filled out for DoD projects (USACE, Navy, AFCEE)***

| Yes | No | | |
|---|---|---|---|
| ___ | ___ | Is received temperature 4 ± 2°C? | |
| | | Exceptions: | Samples/Analyses Affected: |
| ___ | ___ | If temperature(s) <0 °C, were containers ice-free? N/A | |
| | | *Notify PM immediately of any ice in samples.* | |
| ___ | ___ | Was there an airbill? *(Note # above in the right hand column)* | |
| ___ | ___ | Was cooler sealed with custody seals? | |
| | | # / where: _____ | |
| ___ | ___ | Were seal(s) intact upon arrival? | |
| ___ | ___ | Was there a COC with cooler? | |
| ___ | ___ | Was COC sealed in plastic bag & taped inside lid of cooler? | |
| ___ | ___ | Was the COC filled out properly? | |
| ___ | ___ | Did the COC indicate USACE / Navy / AFCEE project? | |
| ___ | ___ | Did the COC and samples correspond? | |
| ___ | ___ | Were all sample packed to prevent breakage? | |
| | | Packing material: _____ | |
| ___ | ___ | Were all samples unbroken and clearly labeled? | |
| ___ | ___ | Were all samples sealed in separate plastic bags? | |
| ___ | ___ | Were all VOCs free of headspace and/or MeOH preserved? | |
| ___ | ___ | Were correct container / sample sizes submitted? | |
| ___ | ___ | Is sample condition good? | |
| ___ | ___ | Was copy of CoC, SRF, and custody seals given to PM to fax? | |

***This section must be filled if problems are found.***

**Yes** **No**

____ ____ Was client notified of problems?

Individual contacted: _____
Via: Phone / Fax / Email (*circle one*)
Date/Time: _____
Reason for contact: _____

_____
_____
_____
_____
_____

Change Order Required? _____
SGS Contact: _____

**Notes:** _____

**Completed by (sign):** Carmon Beene **(print):** CARMON BEENE

**Login proof** (check one): waived ____ required ✓ performed by: _____

SGS

SGS WO#: 1085923

## SAMPLE RECEIPT FORM FOR TRANSFERS
From
FAIRBANKS, ALASKA OR HONOLULU, HAWAII
To
ANCHORAGE, AK

**TO BE COMPLETED IN ANCHORAGE UPON ARRIVAL FROM FAIRBANKS OR HAWAII. NOTES RECORDED BELOW ARE ACTIONS NEEDED UPON ARRIVAL IN ANCHORAGE.**

**Notes:** _____

_____

_____

_____

_____

**Receipt Date / Time:** 9/27/08 1110

**Is Sample Date/Time Conversion Necessary?** Yes _____ No no

**Number of Hours From Alaska Local Time:** —

**Foreign Soil?** Yes _____ No ✓

**Delivery method to Anchorage** (*circle all that apply*):

Alert Courier / UPS / FedEx / USPS / AA Goldstreak / NAC / ERA / PenAir / Carlile (Lynden) SGS

Other: _____

**Airbill #** _____

**COOLER AND TEMP BLANK READINGS***

| Cooler ID | Temp Blank (°C) | Cooler (°C) | Cooler ID | Temp Blank (°C) | Cooler (°C) |
|---|---|---|---|---|---|
| 1 | 6.0 | 0.8 | | | |
| | | | | | |
| | | | | | |
| | | | | | |

**CUSTODY SEALS INTACT:** (YES) / NO

**# / WHERE:** 2, 1 on front + 1 on back

**COMPLETED BY:** Joe Rudi

**Temperature readings include thermometer correction factors.*

SGS

1085923

SAMPLE RECEIPT FORM (page 2)

SGS WO#

| # | Container ID | Matrix | Test | QC | TB | Container Volume: 1 L | 500 mL | 250 mL | 125 mL | 60 mL | 40 mL | 8oz (250 mL) | 4oz (125 mL) | Other | Container Type: AG | CG | HDPE | Nalgene | Cubie | Coli | Septa | Other | Preservative: None | HCl | $HNO_3$ | $H_2SO_4$ | MeOH | $Na_2S_2O_3$ | NaOH | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1-7 | A | 2 | BTEX 8021 | | | | | | | | | | 7 | | ✓ | | | | | | ✓ | | | | | | ✓ | | | |
| | B | 2 | DRO AK102 | | | | | | | | | 7 | | | ✓ | | | | | | | | ✓ | | | | | | | |
| 8 | A | 2 | PAH 8270 SIMS | | | | | | | | | 1 | | | ✓ | | | | | | | | ✓ | | | | | | | |
| 9 | A | 2 | BTEX 8021 | | ✓ | | | | | | | | 1 | | ✓ | | | | | | ✓ | | | | | | ✓ | | | |
| Bottle Totals | | | | | | | | | | | | 8 | 8 | | | | | | | | | | | | | | | | | |

Completed by: [signature] Date: 9/27/08

Form # F004r16 revised 03/10/08

SGS Environmental **CUSTODY SEAL** WO# 5923 15924

Signature: Carmen Beeno Date/Time: 9/26/08 1645

SGS Environmental **CUSTODY SEAL** WO# 5923, 15924

Signature: Carmen Beeno Date/Time: 9/26/08 1645