REMEDIAL INVESTIGATION REPORT

PREPARED BY:

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PREPARED FOR:

MR. STEVE KLETT
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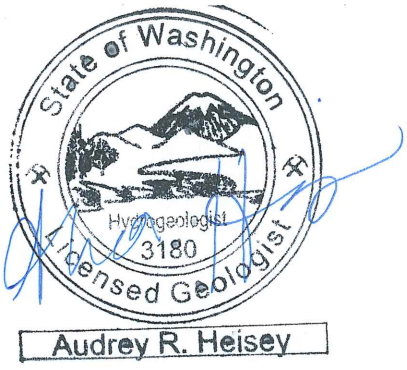
415 MAPLE AVENUE
SNOHOMISH, WASHINGTON 98290

RGI PROJECT NO. 2018-240
ECOLOGY CSID NO. 417



REMEDIAL INVESTIGATION REPORT
415 MAPLE AVENUE
SNOHOMISH, WASHINGTON 98290

MAY 9, 2019

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TABLE OF CONTENTS

LIST OF APPENDICES

1.0 INTRODUCTION

Riley Group, Inc. (RGI) is pleased to present this Remedial Investigation (RI) Report summarizing remedial investigation activities conducted for the property located at 415 Maple Avenue in Snohomish, Washington (hereafter referred to as the Property). The location of the Property is displayed on Figures 1 and 2.

This RI report was prepared to meet the requirements of the Washington State Model Toxics Control Act (MTCA) regulation (173-340 Washington Administrative Code (WAC)) which mandates the necessity of and establishes requirements for site cleanups that are protective of human health and the environment.

1.1 Project Overview

The Property is an approximately 0.34-acre parcel with a 6,156-square-foot commercial building constructed in 1975 located in the Pilchuck District of Snohomish. The Property currently operates as a small electric motor repair and service shop.

In 2006, during an inspection for the eastern adjoining CSID #380, grease stained soil was observed in a limited area near the eastern Property boundary by the inspector. The inspection report notes that it hadn't rained for some time and the stained area appeared limited. The inspector opened an environmental report (ERTS 557432) and collected soils samples. Analytical results for the soil sample indicated cadmium, lead, and heavy oil were present in soil at concentrations above State cleanup levels. An initial investigation and site hazard assessment was conducted by Ecology. The Property was then recommended for inclusion on the Confirmed and Suspected Contaminated Sites List (CSCSL). The Property owner was notified of the listing via an Early Notice Letter and the Site was assigned CSID #417. The current Site status is "Awaiting Cleanup".

Steve Klett and Sea-Alaska Industrial Services, Inc. (collectively referred to as the Client hereafter) requested that RGI conduct RI activities and prepare this RI report. The work was performed in general accordance with RGI's Site Characterization, Remediation, and Regulatory Services Proposal dated November 9, 2018, which was authorized by the Client on November 14, 2018.

1.2 Property Information

Ecology Site Name:	Sea-Alaska Industrial Electric
Site Address:	415 Maple Avenue, Snohomish, WA 98290
Snohomish Parcel No.:	28061800206800
Ecology Cleanup Site ID:	417
Ecology Facility/Site No.:	9525627
Project Consultant:	Riley Group, Inc.
Project Consultant Contact Information:	Audrey R. Heisey, LHG 17522 Bothell Way NE, Bothell, WA 98011
Current Owner/ Operator	Steve Klett Client Contact

2.0 DESCRIPTION OF PROPERTY AND ADJOINING PROPERTIES

2.1 Property Identification and Location

The Property is defined as a 0.34 acre tax parcel (Snohomish County tax parcel #2806-1800206800). The Property is currently occupied by a small electric motor repair business with one 6,156 square-foot slab on grade building constructed in 1975. The boundaries of the Property are the same as the boundaries of the tax parcel.

2.2 Zoning

The property is in the Center portion of the Pilchuck District. The Pilchuck District was designated in 2011 to create a compact mixed-use walkable neighborhood near Centennial Trail in Snohomish; the Center portion of the zone is designated for mixed-use allowing both commercial and residential uses.

2.3 Potential Future Development

Although currently used for light industrial purposes, the Property is located in a zone designated for anticipated commercial and residential mixed use.

2.4 Current Adjoining Property Uses

Typical property use in the Property vicinity is a mixture of residential and commercial properties. Current uses of adjoining properties are summarized as follows:

North: The Health Spot, a natural remedies retail shop, beyond which is Snohomish Mini-storage, a self-storage facility.

Northeast: Asphalt paved parking, beyond which is Centennial Trail constructed in the alignment of the former Burlington Northern Railroad line.

East Snohomish Senior Center asphalt paved parking lot and, to the southeast, Snohomish Senior Center building. The Snohomish Senior Center property is part of the "506 4th St City of Snohomish" cleanup site (CSID #380). CSID #380 is further discussed in Section 4.2.1 of this report.

South: A warehouse building with three tenants beginning closest to the property: Beez Neez Apiary Supply – beekeeping supplies and local raw honey, Roto Rooter – plumbing contractor, and Culligan, pump and well service contractor.

West/Southwest: Maple Avenue, beyond which are single-family residences and multi-family building.

2.5 Utilities and Water Supply

The utilities (main water, storm, and sewer) for the Property are connected to municipal facilities along Maple Avenue, located to the west of the Property. Drinking water for the area is supplied by the City of Everett with the remainder from Snohomish PUD, and is sourced primarily from rain and snowmelt from the Cascade Mountains that is stored in Spada Lake Reservoir at the headwaters of the Sultan River (2017 Drinking Water Quality Report, City of Everett).

3.0 HISTORICAL INFORMATION

RGI reviewed available documentation on file with Ecology for CSID #380. RGI also reviewed historical aerials for the Property and adjoining properties that are available on-line for the years 1933, 1938, 1952, 1969, 1980, 1981, and 1991. Current assessor Property boundaries are provided as Appendix A.

Former Property boundaries, as depicted on historical Sanborn fire insurance maps, are provided as Appendix B. Figure 2 provides a representation of former Property boundaries overlaying the current Property boundaries and features.

3.1 Historical Property Uses

Based on available historical information, the Property was developed since at least the early 1900's with a single-family residence with an associated storage and garage building. Sometime between 1952 and 1969 the residence and accompanying buildings were razed. In 1975, the existing Sea-Alaska building was constructed on the property replacing vacant land. The Property boundaries were adjusted from the depiction on the 1954 Sanborn map to the present boundaries sometime between 1954 and 1975. The historical fire insurance maps depict buildings associated with both the south and east properties on what is now current Property land. The former Property boundaries and structures included a portion of either the south adjoining property, *Central Feed Mills*, or the east adjoining property, *former Northern Pacific railroad (NPRR) switching yard*, up until at least 1954. The current and former Property boundaries and features are depicted on Figure 2.

3.2 Historical Adjoining Property Uses

North: The adjoining parcel to the north was developed with a single-family residence (SFR) from the early 1900's to at least 1954. The property converted to a self-storage facility between 1981 and 1991.

East: The eastern adjoining property was developed as *Northern Pacific Railroad (NPRR)* siding and switches from at least the early 1900's to between 2006 and 2009, when the property was redeveloped into its current use as the City of Snohomish Senior Center.

South: The southern adjoining property was developed as *Central Feed Mills* from early 1900's to the early 1950's. The property was listed as vacant in 1954 and was redeveloped into a library in 1987. Current use of the property is described in Section 2.4.

West: The western adjoining property was developed with Maple Avenue with an SFR beyond from at least the early 1900's to the 1980's. In the 1980's, a multi-family residence was constructed, replacing the SFR.

4.0 POTENTIAL SOURCES OF CONTAMINATION

4.1 Potential On-Property Sources of Contamination

There are no known potential sources of contamination at the Property. The Property has been in operation as a small electric motor repair shop since 1989. Property operations do not use regulated waste products and do not generate spent hazardous chemicals. Service and repair operations do not, therefore, require a hazardous waste generator permit.

Electric motors operate with a highly conductive stator coil (typically copper) that is charged with a current of sourced electricity. The moving part, a rotor, is delicately balanced to rotate electromagnetically, generating energy for the object needing movement. The electric motor is built as large as needed to energize the device requiring power but all are constructed with generally the same design.

Electric motors do require a small amount of grease within the bearings to lubricate. Regular maintenance includes replacing the stator coil or insulation (grease coating, premanufactured coatings,

tapes, resins, and other solid materials) to renew/preserve electric conductivity and rebalancing the rotor. Waste generated from maintenance and repair activities is considered non-hazardous solid waste (e.g. old insulation or wire binders). Built up carbon dust can accumulate from the carbon brushes which are used to transfer current between the static parts and the moving rotor. Cleaning the parts and carbon build up is accomplished using highly pressurized water without additives. Pressure washing was conducted at the wash pad on the eastern portion of the Property up until the facility obtained an automatic pressure washer that is housed inside. Waste remnants from the automatic pressure washer are non-hazardous and are disposed of as solid waste.

4.2 Potential Off-Property Sources of Contamination

Documented fill soil contaminated with petroleum hydrocarbons, lead, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) at the former feed mill and railroad operations on the adjoining properties to the south and east are known potential off-Property sources of contamination. Several features of potential contamination were reported as observed along the shared boundary with the Property boundary, where CSID #380 is located. Former documentation reviewed under CSID #380 is provided as Appendix C. As well, historical fire maps document former structures associated with the sites discussed below on and/or near the Property.

4.2.1 Eastern Adjoining Site, CSID #380, Site name: City of Snohomish: RGI requested available CSID #380 files for review with this RI. The eastern adjoining property was developed as *NPRR* switching yard dating back to the early 1900's to approximately 2006. The initial report for the property indicates, "(an) uncontrolled release of hazardous waste at the city property". Photos from a site visit show the property as covered with overgrown vegetation alongside the lot boundaries. HWA reported observations of several locations with cinder or slag shallow fill soil, abandoned unused steel storage tanks, and gravel parking used for truck trailers were reported at the western and northwestern portions of the property during the investigation (HWA, 2006).

In 2006, HWA conducted a soil sampling investigation on the almost three-quarter acre adjoining property, digging eight test pits and collecting samples from the piles of contaminated soil for geotechnical evaluation and chemical analysis. Analytical results indicated detections of gasoline, diesel, and oil range petroleum hydrocarbons (which includes grease), lead, mercury, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) across the property. Gasoline range petroleum, lead fill, and cPAHs were detected in soil above screening levels. Testing for polychlorinated biphenyls (PCBs) was conducted for investigation conducted for CSID#380.

PAH (including cPAHs) compounds are associated with cinder, slag, as well as, preserved wood (e.g. railroad ties). University of Washington has studied the effects of preserved wood on shallow soil. Chemicals used to preserve wood, such as railroad ties, were banned in 1986 by the EPA. The now banned chemicals used to preserve wood include a mixture of copper, chromium, arsenic, and heavy oil range petroleum and have been demonstrated to leach into shallow soil (UW, 2006).

The follow up report for CSID#380 indicates, "(the city) wanted to remove the USTs and piles of contaminated soil on site and cap lead contaminated soil to accomplish cleanup". The current site status is 'cleanup started'. In 2007, the east adjoining property was redeveloped into a senior housing facility and no other information characterizing the CSID#380 is in Ecology's files.

Additionally, metal railcar containers may present a potential source of cadmium. Cadmium containing materials are commonly used to coat steel and nonferrous metals, such as rail cars, to inhibit rust. Rail

cars coated with cadmium containing materials have a characteristic rusty red color. Rail car storage associated with CSID #380 over several decades may be a source of cadmium in shallow soil (Chunhabundit, 2016).

4.2.2 Southern Adjoining Site, Central Feed Mill: The southern adjoining property was developed as Central Feed Mill from early 1900's to the early 1950's. Gas and oil storage are depicted on the 1954 Sanborn map. The feed mill site is not listed or documented on the State's contaminated Sites publically available databases. However, soil contaminated with petroleum hydrocarbons, lead, and cPAHs is documented at the feed mill property (HWA, 2006). The feed mill property underwent cleanup of petroleum and hazardous materials when it was redeveloped in the 1990's into a public library. Details of the cleanup, such as the location of petroleum or hazardous materials cleaned up, type of remediation performed, and confirmation sampling with an evaluation of effectiveness complying MTCA cleanup rules was not available in the documents reviewed. Note: southern property building(s) one time occupied a portion of the current Property.

5.0 NATURAL CONDITIONS

5.1 Physiographic Setting and Topography

The Property is located on the United States Geologic Survey (USGS) Snohomish, Washington, 7.5-Minute Topographic Map (Figure 1) at an elevation of approximately 70 feet above mean sea level. The Property is located in the northwest quarter of Section 18 of Township 28 North, Range 6 East of the Willamette Meridian.

The Property and most of the surrounding area slope slightly south south-west towards Snohomish River.

5.2 Surface Water

The nearest surface water is Pilchuck River, located approximately 1,000 feet to the east. There is no surface water on the Property or adjacent properties.

5.3 Geologic Setting

The Department of Natural Resources – Washington Geologic Information Portal maps the Property as Quaternary alluvium (Qa), which is described as unconsolidated or semi-consolidated alluvial clay, silt, sand, gravel, and (or) cobble deposits. The description also includes artificial fill and modified land.

5.4 Soil

Based on nearby boring logs available on Ecology's well log database, the Property is underlain by brown silty sand with clay to 4 feet bgs, grading to silty sand with gravel to a depth of at least 20 feet. Test pits for the east adjoining property report medium dense brown coarse sand with gravel and cobbles to 9 feet bgs.

5.5 Groundwater

Groundwater was not reported in the eight test pits advanced on the eastern adjoining property to 9 feet bgs and to 10 feet bgs during redevelopment of the southern adjoining property. Nearby boring logs did not report groundwater at depths reaching 20 feet bgs, the maximum depth of exploration, in boring logs reviewed near the Property.

6.0 PREVIOUS ENVIRONMENTAL REPORTS

Sea-Alaska Industrial Electric – Environmental Report Tracking System file #557432, dated September 2006 prepared by Snohomish County Health District and Ecology.

In August 2006, a Snohomish County Health District (SHD) inspector observed a limited area of grease stained soil outside of the back concrete wash pad while conducting an inspection (on behalf of Ecology) for the adjacent cleanup site CSID #380.

On September 26, 2006, SHD collected three soil samples (#1 and #2 - located on the east side of the wash pad off-Property, and #3 - located on the west side of the wash pad on-Property) from the observed limited area of contamination. The soil samples were submitted to a Washington accredited laboratory and analyzed for lead, cadmium, chromium, diesel- and oil-range total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), and PCBs. Analytical results for the soil samples collected indicated lead, cadmium, PCBs, and TPH above screening levels. The location of the soil samples are depicted on Figure 3.

While the SHD inspector collected three soil samples for chemical analysis, they were also there to conduct an inspection associated with CSID #380. However, no soil samples were reportedly collected in association with the east adjoining known CSID #380 by the SHD inspector. The results of the chemical analysis for soil samples collected were associated with ERTS #557432 (later to become CSID #417) for the Property. The soil analytical results, when not viewed in context or with an understanding of previous uses of the Property and surrounding properties, appear as though they were associated with the "limited area" noted by the inspector. However, it is possible contamination found is actually associated with the uncharacterized CSID #380 or the undocumented cleanup site to the south; this possibility was not examined further or noted in inspection records.

Results indicated heavy oil range hydrocarbons at concentrations requiring cleanup, which the owner does not dispute may be sourced from pressure washing overspray releasing small amounts of grease from the electric motors over several decades. However, cadmium, lead, and PCBs were detected at concentrations requiring cleanup. The owner states that there is no on-Property operation, now or in the past, that would generate cadmium, lead, and PCBs. Based on the analytical results for soil samples collected by SHD the Property was referred for listing on the CSCSL for soil contaminated with lead, cadmium, petroleum, and PCBs.

The 2006 SHD inspection report for the Property also included a neighbor's allegation that the facility had burned batteries in the back in the past. Nothing was provided to support further investigation, such as photos, interviews, or any other evidence and no further mention or follow-up was recommended by SHD or Ecology. The facility owner does not work with batteries and denies the claim. The owner states that property operations, since development in 1975, solely involve the repair of electric motors that do not require measurable quantities of petroleum product to operate; as well, operations do not involve the repair or service of batteries of any kind or potential PCB containing electrical equipment, such as transformers or ballasts. A description of the process for electric motors and their service/repair is described in Section 4.1.

7.0 INTERIM ACTIONS SUMMARY

In 2007, after learning that cleanup is required at the "limited area" of grease stained soil previously identified by the inspector at the eastern Property boundary, the Client removed the top approximately four inches of soil in the limited area. Then a short concrete wall was constructed, with a fence on top of the wall, at the eastern edge of the wash pad (which is also the eastern Property boundary) to clearly delineate the two properties. Soil was removed until the grease stained soil was completely removed.

The total amount of stained soil removed was 0.71 tons. The soil was stockpiled in a plastic tote and stored inside the Property building pending proper disposal. This was in 2006, around the same time that the eastern adjoining property was being redeveloped into the Snohomish Senior Center (CSID #380). The land directly to the east, abutting the Property's concrete wall, is now a landscaped strip/median with asphalt parking beyond. The main Snohomish Senior Center building is located further south along 4th Street. Photos are provided as Appendix D.

In 2017, the Client contacted Ecology and attempted to enter the Voluntary Cleanup Program (VCP) to get an opinion of cleanup of Site #417. However, Ecology indicated a report must be submitted for review and an application for inclusion in the VCP must be received. Ecology indicated a professional may be best to assist with the VCP process.

In 2018, the Client retained RGI to collect confirmation soil samples at the extent of removed soil and from beneath the concrete wash pad to document in-situ soil quality, collect a composite soil sample from the stockpiled soil from 2007 that was stored in a plastic tote inside the facility, for proper disposal characterization analysis, and prepare this report to document activities conducted to date.

In 2018, the soil samples (SA1 through SA8) were collected from the east, west, and beneath the wash pad. The soil samples that represent soil located beneath the wash pad were collected by creating a hole using a 4 inch concrete corer and hand auger to a depth interval of 6 to 12 inches. Each concrete cored sampling location was patched/replaced with new concrete following completion of sampling. A composite soil sample SA9 was collected from the plastic tote where the soil was placed during the 2007 soil removal to characterize for disposal. The samples were then placed in laboratory provided jars and placed in a cooler with ice pending analysis at a Washington Accredited analytical laboratory, OnSite Environmental in Redmond Washington. Sampling tools/equipment was decontaminated between each sampling location using an Alconox™ tap water rinse.

It was not understood that there were adjoining cleanup sites to the south and east with reports of contaminated lead fill, cPAHs, petroleum, and other metals, as this possibility was not documented in the cleanup file for Site #417. CSID #417 is listed *only* for the limited area of grease stained soil noted in 2007 by SHD.

The owner indicated to SHD that property operations do not use regulated waste products, service and repair activities do not generate petroleum waste products, and do not generate spent hazardous chemicals. The only activity that may contribute to a stain is overspray associated with pressure washing electric motor parts that have a grease coating to prevent corrosion. Service and repair operations do not require a hazardous waste generator or regulated waste disposal permit. While it is possible that grease (heavy oil range petroleum) accumulated over several decades from pressuring washing overspray, no regulated materials were not purposefully "spilled" or disposed there.

8.0 CONCEPTUAL SITE MODEL

8.1 Terrestrial Ecological Resources

A TEE is required by WAC 173-340-7490 at any Site where there has been a release of a hazardous substance to soil. The regulation requires that one of the following actions be taken:

- Documenting a TEE exclusion
- Conducting a simplified TEE
- Conducting a site-specific TEE

The Property qualifies for a TEE exclusion since:

1) Contaminated soil is, or will be, covered by buildings, paved areas, or other physical barriers that would prevent wildlife or plants from being exposed to the contamination (WAC 173-340-7491), and
2) The Property is not contaminated with those compounds listed in WAC 173-340-7491(1)(c)(ii) and there are less than 1.5 acres of contiguous undeveloped land on or within 500 feet of any area of the Property.

No further consideration of ecological impacts is required under MTCA. The TEE exclusion form and supporting maps are provided as Appendix E.

8.2 Contaminants of Concern and Occurrence

The Contaminants of Concern (COCs) identified in the section are not an admission that the source of the COCs originated from on the Property or from current and/or past Property operations.

8.2.1 Soil

Based on information provided from previous environmental investigations, TPH as diesel (TPHd) and/or oil (TPHo), VOCs – including benzene, toluene, ethylbenzene and xylenes (BTEX) and halogenated VOCs (HVOCs), PCBs, cPAHs, naphthalene, mercury, lead, cadmium, total chromium, chromium IV, and arsenic have been tested in soil at the Site. The following COCs have been detected above the laboratory reporting limit or above regional background concentrations for metals, and are therefore, considered COCs in soil at the Property:

- TPHo
- Cadmium
- Lead
- cPAHs

Property Occurrence

The limited area of grease stained soil observed in 2006 by SHD was removed and stockpiled for proper disposal in 2007 by the owner. Analytical results for confirmation soil samples SA3 through SA7, collected in 2018 adjacent to the wash pad demonstrate that grease stained soil was effectively removed from the Property.

Soil samples SA4 and SA3, collected in 2018 beneath the wash pad, demonstrate that contaminants overlap with the eastern adjoining CSID #380. The soil samples were collected beneath the concrete pad using a concrete coring device and hand auger. Lead and heavy oil contaminated soil is present above background concentrations beneath the concrete wash pad. Lead concentrations range between 85 milligrams per kilogram (mg/kg) and 260mg/kg beneath the pad. Soil with indications of TPH left in place beneath the pad were reported by the laboratory at a concentration of between non-detect and 230mg/kg. The wash pad is constructed of concrete effectively capping the soil and preventing migration since development in 1975.

Site Occurrence

The disposal sample SA9 documents the limited area of grease stained soil that was removed and stockpiled during the soil excavation in 2007. Soil samples SA1, SA2, and SA8 document the concentrations of COCs in soil at the east adjoining CSID#380. Because site characterization has not been conducted at the east adjoining CSID #380 or at the undocumented cleanup site to the south and because the COCs associated with those sites, overlap with those COCs associated with CSID #417, it is

not possible to differentiate contaminant occurrence between the three Sites. Potentially contaminated soil on the adjoining property to the east is capped with asphalt, limiting mobility, or landscaped with mulch and bushes preventing direct human contact.

8.2.2 Groundwater

Groundwater has not been encountered to a depth of 10 feet bgs during redevelopment at the adjoining property to the south, and has not been reported to 20 feet bgs in nearby well logs reviewed for this investigation. Given the depth that contaminated soil has been reported and the mobility characteristics of identified COCs, an evaluation of groundwater associated with the Site is not necessary at this time.

8.2.3 Surface Water

There is not a surface water body or significant drainage on the Site. Therefore, an evaluation of this media is not necessary.

8.2.4 Sediment

Sediment is not present on the Site. Therefore, an evaluation of this media is not necessary.

8.2.5 Air/ Soil Vapor

RGI conducted a preliminary vapor intrusion assessment for the Site. Volatile chemicals have not been detected in soil at concentrations exceeding the most stringent soil screening levels at the Site, indicating further vapor intrusion evaluation is not necessary.

8.3 Potentially Complete Exposure Pathways

A potentially complete exposure pathway consists of: 1) an identified contaminant source; 2) a transport pathway to locations (exposure points) where potential receptors might come in contact with the COC; and 3) an exposure route (e.g., soil ingestion, vapor inhalation, drinking water) through which potential receptors might be exposed to the COC.

Dermal contact for excavation/utility workers in the location of remaining lead contaminated fill is the only identified potentially complete pathway. The Property is expected to be sold with potential redevelopment into a commercial or residential building. If excavation of soil occurs during the potential redevelopment, proper characterization and disposal of the fill will be necessary.

9.0 CLEANUP STANDARDS

In Washington State, the Model Toxics Control Act (RCW 70.105D), mandates that site cleanups protect human health and the environment. The MTCA Cleanup Regulation (WAC173-340) defines the approach for establishing cleanup requirements for individual sites, including the establishment of cleanup standards and selection of cleanup actions.

The MTCA regulation provides three options for establishing generic and site-specific cleanup levels for soil and groundwater. Method A cleanup levels have been adopted for specific purposes and are intended to provide conservative cleanup levels for sites undergoing routine site characterization or cleanup actions or those sites with relatively few hazardous substances. Method B and C cleanup levels are set using a site risk assessment, which focus on the use of “reasonable maximum exposure” assumptions based on site-specific characteristics and toxicity of the COCs.

The MTCA Method B cleanup levels for soil are the adopted cleanup levels for identified COCs at the Property. In general, the direct contact Method B carcinogenic soil cleanup levels were used. When no carcinogenic direct contact value was available, the non-carcinogenic value was used. When no direct contact value was available, the Method B soil cleanup levels protective of groundwater at 13 ^{o}C were used. The only exception to this was the use of MTCA Method A soil cleanup levels for Total Petroleum Hydrocarbons (TPH) as allowed by Ecology. All cleanup levels referenced were obtained from the Ecology Cleanup Levels and Risk Calculation (CLARC) database on April, 24, 2019.

Section 2.5, 5.5, and 8.2.2 provide information indicating groundwater has not been encountered in the area of the Property and is not suspected as a contaminated media.

10.0 MEDIA CLEANUP CRITERIA

If the concentrations of COCs, previously identified for each affected media at the Site, are below selected cleanup levels, then the media cleanup criteria are considered satisfied.

10.1 Soil – Vertical and Lateral

Lead-contaminated soil remains on the Property, albeit below the MTCA Method B soil cleanup level of 3,000mg/kg. The highest concentration of lead detected on the on the Property is 360mg/kg. The point of compliance is in soils throughout the Property.

Heavy TPH contaminated soil remains on the Property, albeit below the MTCA Method A soil cleanup level of 2,000 mg/kg. The highest concentration of TPH detected on the Property is 230mg/kg. The point of compliance is in soils throughout the Property.

Soil media cleanup criteria on the Property are considered satisfied. The Site, which was defined as a "soil contamination in a limited area", was cleaned up in 2007. Because site characterization has not been conducted at the east adjoining CSID #380 or at the undocumented cleanup site to the south and because the COCs associated with those sites, overlap with those COCs associated with CSID #417, it is not possible to differentiate contaminant occurrence between the three Sites.

11.0 CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

The observed limited area of grease stained soil noted by the SHD inspector was effectively removed from the Property in 2007. The soil has been properly disposed at Waste Management's Columbia Ridge Landfill (Alaska Street Transfer Station). All concentrations of COCs in soil on the Property are currently in compliance with MTCA regulations. Waste disposal ticket is provided as Appendix G.

11.2 Recommendations

Request for Property Specific No Further Action for Sea-Alaska – CSID #417, 415 Maple Avenue, Snohomish, Washington (Snohomish County Parcel 28061800206800)

CSID #417 is documented as a limited area of grease staining on soil associated with washing equipment with pressurized water; the soil has been removed, the practice has been changed to an enclosed pressure washing machine housed inside the building, and follow up testing shows that stained soil is no longer present at the Property at concentrations requiring cleanup. Furthermore, the property owner states that Property operations, now or in the past, do not use regulated waste products, service and repair activities do not generate waste that would create metals, cPAH, and/or PCB soil contamination. Soil sample results indicated PCB contaminated soil was never detected on the Property. The soil cleanup completed in 2007 successfully removed all soil containing concentrations of

contaminants of concern above applicable MTCA soil cleanup levels at the Property. Therefore, RGI recommends that the owner submit this report to Ecology requesting that Ecology grant a Property-specific No Further Action determination for the Property.

Lead in soil was placed prior to development of the Property as demonstrated by soil samples collected from beneath the impermeable concrete wash pad. Detections of lead in soil samples collected across the eastern adjoining *former NPRR property* also reported lead contaminated fill, indicating that the Site boundaries and potential contaminants of concern for CSID #380 have come to be on the Property.

The Property owner contends that contaminants causing CSID #417 to be listed, other than oil range petroleum, are not/have not been in use at the Property and are potentially associated CSID #380 or the undocumented cleanup site to the south, *Central Feed Mill*. Limited soil testing has been completed at CSID #380 and no records were found for *Central Feed Mill*. However, the activities associated with former *NPRR* switching yard operations (CSID #380) and *Central Feed Mill* took place over several acres, over several decades, and include documented petroleum storage, contaminated stockpiled soil, cPAHs, heavy metals, cinder and slag fill, and rails with treated wood (railroad spurs). As well, the east and south property operations are documented as occurring on the Property by historical fire insurance maps that date back to before 1950, while the Property was is use as residential. The Property owner should not incur the undue burden of characterizing CSID #380 or the undocumented cleanup site to the south.

Based on these factors, RGI recommends that the Property owner request that Ecology delist the CSID #417 Site.

This Remedial Investigation and Property Specific No Further Action request for 415 Maple Avenue, Snohomish, Washington was prepared in accordance with Chapter 173-340 WAC.

12.0 LIMITATIONS

This report is the property of RGI, Steve Klett and Sea-Alaska Industrial Services Inc. and their authorized representatives or affiliates. This report is intended for specific application to Sea-Alaska Industrial property located at 415 Maple Avenue, Snohomish, Washington.

Work for this project was performed, and this report prepared, in accordance with generally accepted professional practices for the nature and conditions of work completed in same or similar locations at the present time.

The findings, conclusions and any recommendations presented in this report are based upon data obtained by RGI and others at the time of preparing this report. RGI's results and findings do not necessarily reflect subsurface conditions underlying other areas of the Site not investigated. Conditional changes may occur through time by natural or human-made process on this or adjacent properties. Additional changes may occur in legislative standards, which may or may not be applicable to this report. These changes, beyond RGI's control, may render this report invalid, partially or wholly. If variations appear evident, RGI should be notified and RGI reserves the right to modify its conclusions and/or recommendations as new data and information is made available. No legal or other warranty, expressed or implied, is made.

If we may provide you with any additional information or clarification of this work, please contact the undersigned at (425) 415-0551.

Sincerely,

THE RILEY GROUP, INC.

Audrey R. Heisey, LHG
Hydrogeologist/Environmental Manager

Jerry Sawetz
Senior Environmental Scientist

Report Distribution: Mr. Steve Klett, Sea-Alaska Industrial Services (PDF)

13.0 REFERENCES

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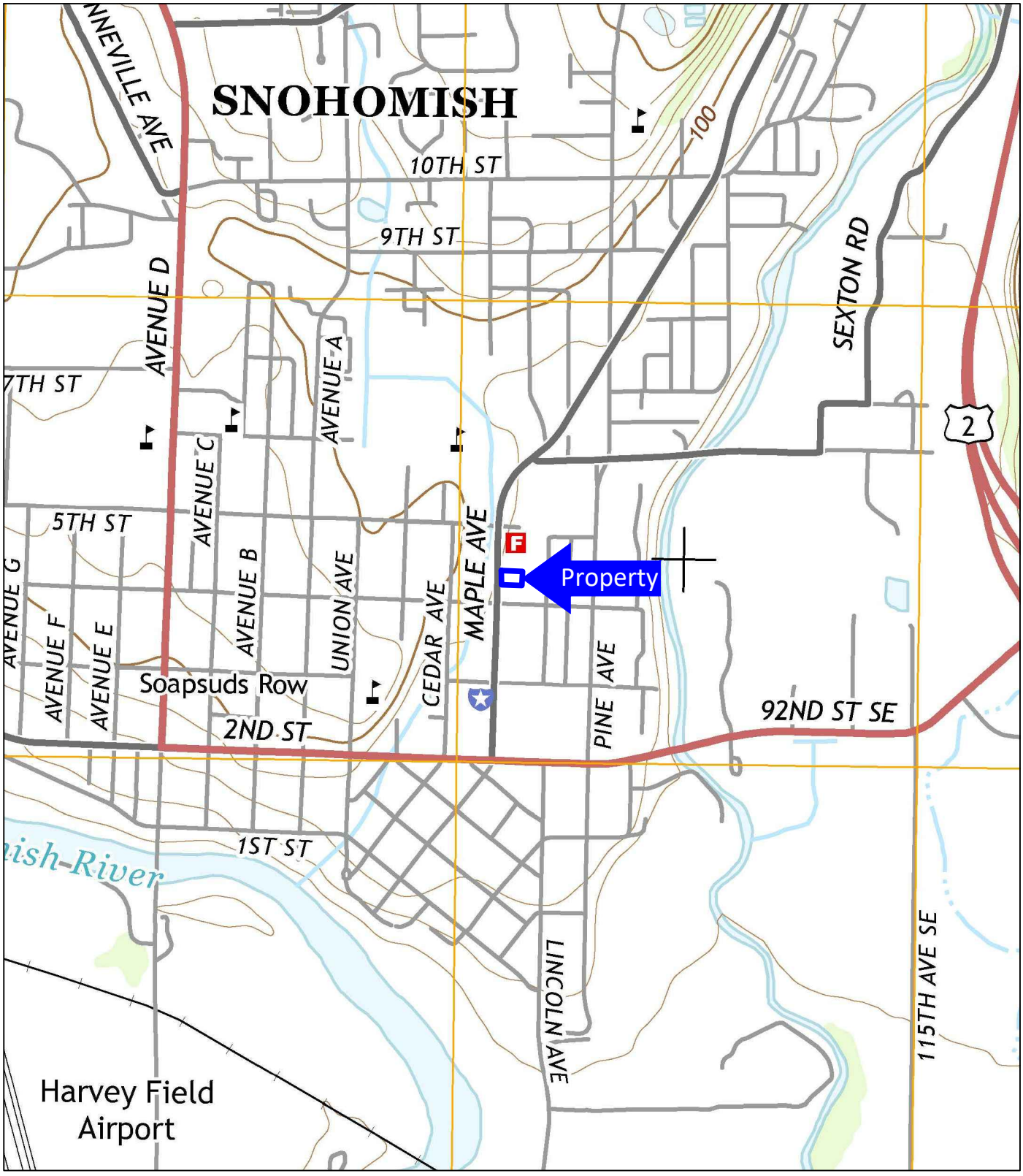
https://depts.washington.edu/hortlib/resources/wp-ganrecord.php?palid=197

See also Appendix C, Former Environmental Reports from Department of Ecology Cleanup File CSID #380 and CSID #417.



USGS, 2014, Snohomish, Washington
7.5-Minute Quadrangle

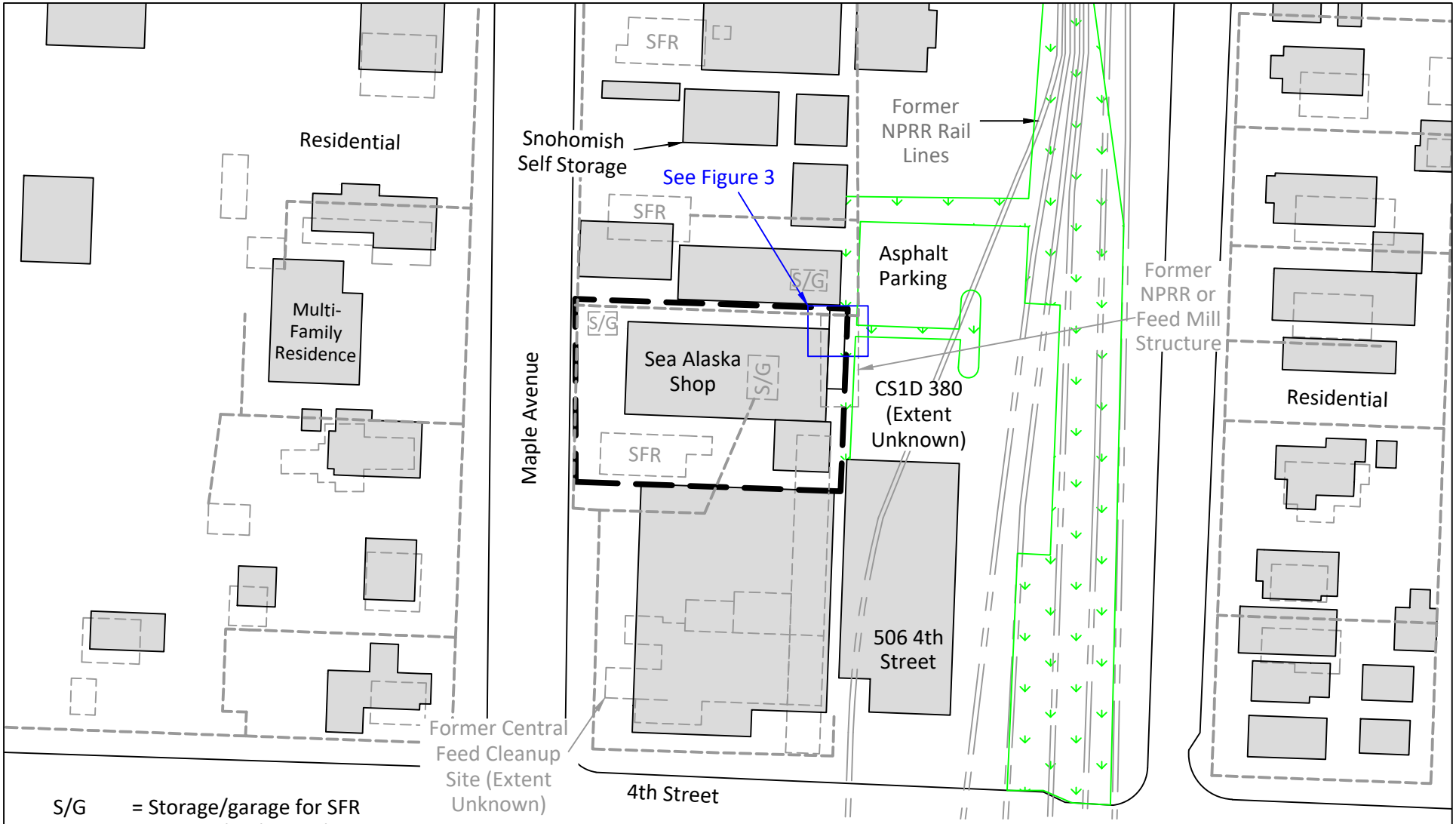
Approximate Scale: 1"=1000'

0 500 1000 2000

N

RILEYGROUP
Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone: 425.415.0551
Fax: 425.415.0311

Sea-Alaska Industrial Services		Figure 1
RGI Project Number 2018-240	Property Vicinity Map	Date Drawn: 05/2019
Address: 415 Maple Avenue, Snohomish, Washington 98290		



S/G = Storage/garage for SFR

= Current landscaped areas

= Approximate early 1900's Property and surrounding area features (as depicted on 1954 Sanborn Map)

= Former Property boundaries (as depicted on 1954 Sanborn Map)

= Current Property and surrounding area features

= Current Property boundary

Approximate Scale: 1"=80'

0 40 80 160

N

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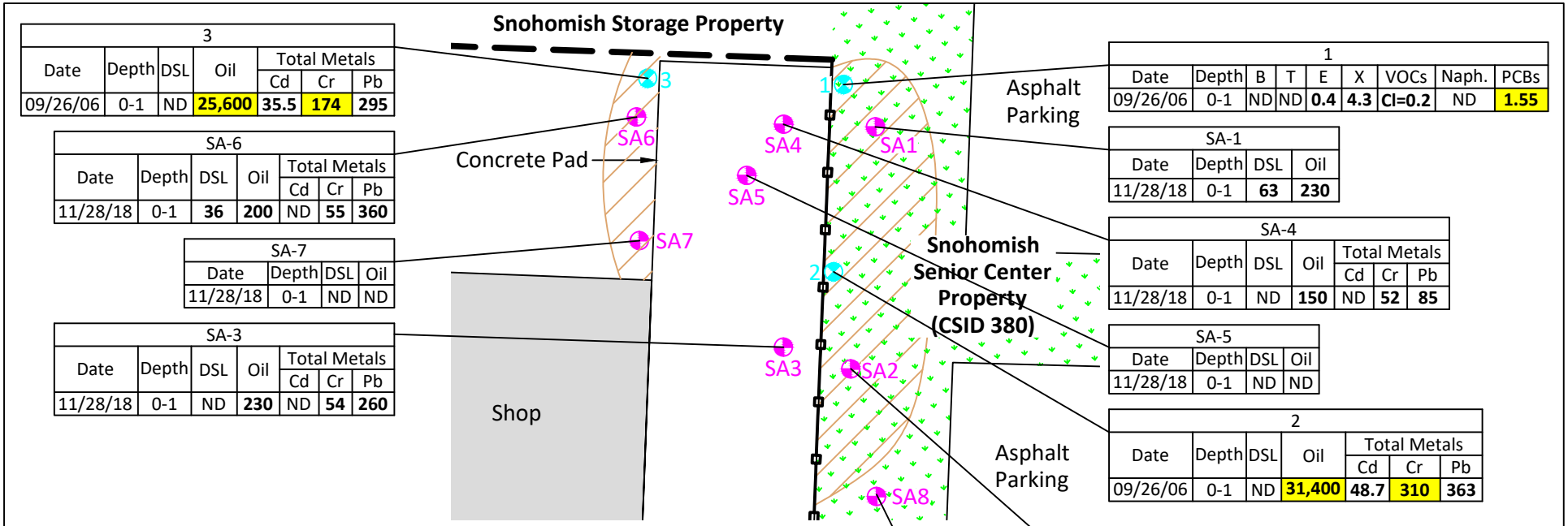
Sea-Alaska Industrial Services		Figure 2
RGI Project Number 2018-240	Property and Surrounding Area with Historical Features	Date Drawn: 05/2019
Address: 415 Maple Avenue, Snohomish, Washington 98290		



3						
Date	Depth	DSL	Oil	Total Metals		
				Cd	Cr	Pb
09/26/06	0-1	ND	**25,600**	**35.5**	**174**	**295**

SA-6						
Date	Depth	DSL	Oil	Total Metals		
				Cd	Cr	Pb
11/28/18	0-1	**36**	**200**	ND	**55**	**360**

SA-7			
Date	Depth	DSL	Oil
11/28/18	0-1	ND	ND

SA-3						
Date	Depth	DSL	Oil	Total Metals		
				Cd	Cr	Pb
11/28/18	0-1	ND	**230**	ND	**54**	**260**

1								
Date	Depth	B	T	E	X	VOCs	Naph.	PCBs
09/26/06	0-1	ND	ND	**0.4**	**4.3**	**Cl=0.2**	ND	**1.55**

SA-1			
Date	Depth	DSL	Oil
11/28/18	0-1	**63**	**230**

SA-4						
Date	Depth	DSL	Oil	Total Metals		
				Cd	Cr	Pb
11/28/18	0-1	ND	**150**	ND	**52**	**85**

SA-5			
Date	Depth	DSL	Oil
11/28/18	0-1	ND	ND

2						
Date	Depth	DSL	Oil	Total Metals		
				Cd	Cr	Pb
09/26/06	0-1	ND	**31,400**	**48.7**	**310**	**363**

= Soil Analytical Data in mg/kg;

Depth = Feet below ground surface
BTEX = Benzene, toluene, ethylbenzene, xylenes
DSL/Oil = Diesel/oil total petroleum hydrocarbons
Naph. = Naphthalene
cPAHs = Carcinogenic polycyclic aromatic hydrocarbons
PCBs = Polychlorinated biphenyls
As, Cd, Cr, CrVI, Pb, Hg = Arsenic, cadmium, chromium, hexavalent chromium, lead, mercury
VOCs = Volatile organic compounds,
Cl = Chloroform
ND = Not detected above laboratory detection limits
Bold results indicate concentrations above laboratory detection limits
Bold and highlighted results indicate concentrations above MTCA Soil Cleanup Levels

SA-2									
Date	Depth	DSL	Oil	PCBs	Total Metals				
					As	Cd	Cr	Pb	Hg
11/28/18	0-1	**160**	**1,000**	ND	**17**	**1.6**	**89**	**2,600**	ND

SA-8											
Date	Depth	DSL	Oil	Naph.	cPAHs	PCBs	Total Metals				
							As	Cd	Cr	Pb	Hg
11/28/18	0-1	ND	**3,800**	**0.5**	**0.318**	ND	**15**	**4.1**	**57**	**960**	**1.0**

= Soil sample location by RGI, 11/28/2018
= Approximate location of 2007 Soil Removal
= Soil sample location by Snohomish County Health District, 09/26/06
= Property boundary with two foot concrete wall and fence
= Property boundary

Approximate Scale: 1"=8'
0 4 8 16
N

RILEYGROUP
Corporate Office
17522 Bothell Way Northeast
Bothell, Washington 98011
Phone: 425.415.0551
Fax: 425.415.0311

Sea-Alaska Industrial Services | Figure 3

RGI Project Number 2018-240 | Property Representation with Soil Sample Locations and Analytical Results | Date Drawn: 05/2019

Address: 415 Maple Avenue, Snohomish, Washington 98290

Table 1. Summary of Soil Sample Analytical Laboratory Results
Sea-Alaska Industrial Services
415 Maple Avenue, Snohomish, Washington 98290
The Riley Group, Inc. Project No. 2018-240

Sample Number	Sample Depth	Sample Date	B	T	E	X	Diesel TPH	Oil TPH	EPH	Hexane	VOCs	Naph.	cPAHs	PCBs	Total MTCA Metals						TCLP Metals		
															As	Cd	Cr	CrVI	Pb	Hg	Cd	Cr	Pb
SHD Soil Samples Collected On Property (Overexcavated in 2007)																							
3	0-1	09/26/06	----	----	----	----	ND<50	**25,600**	----	----	----	----	----	----	----	**35.5**	**174**	----	**295**	----	----	----	----
RGI Soil Samples Collected on Property																							
SA-3	0-1	11/28/18	----	----	----	----	ND<32	**230**	----	----	----	----	----	----	----	ND<0.63	**54**	----	**260**	--	----	----	----
SA-4	0-1	11/28/18	----	----	----	----	ND<33	**150**	----	----	----	----	----	----	----	ND<0.65	**52**	----	**85**	--	----	----	----
SA-5	0-1	11/28/18	----	----	----	----	ND<34	ND<67	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SA-6	0-1	11/28/18	----	----	----	----	**36**	**200**	----	----	----	----	----	----	----	ND<0.67	**55**	----	**360**	--	----	----	----
SA-7	0-1	11/28/18	----	----	----	----	ND<33	ND<67	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SHD Soil Samples Collected on East Adjoining CSID #380 (Overexcavated in 2007)																							
1	0-1	09/26/06	ND<0.025	ND<0.10	**0.4**	**4.3**	----	----	----	----	**Cl = 0.2**	ND<0.10	----	**1.55**	----	----	----	----	----	----	----	----	----
2	0-1	09/26/06	----	----	----	----	ND<50	**31,400**	----	----	----	----	----	----	----	**48.7**	**310**	----	**363**	----	----	----	----
RGI Soil Samples Collected on East Adjoining CSID #380																							
SA-1	0-1	11/28/18	----	----	----	----	**63**	**230**	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
SA-2	0-1	11/28/18	----	----	----	----	**160**	**1,000**	----	----	----	----	----	ND<0.069	**17**	**1.6**	**89**	----	**2,600**	ND<0.35	----	----	----
SA-8	0-1	11/28/18	----	----	----	----	ND<480	**3,800**	**1,001**	ND<0.079	----	**0.5**	**0.3176**	ND<0.069	**15**	**4.1**	**57**	----	**960**	**1.0**	----	----	----
RGI Stockpile Soil Sample for Disposal (from soil overexcavated at both the Property and the East Adjoining CSID #380																							
SA-9	Disposal	11/28/18	----	----	----	----	ND<5,800	**66,000**	----	----	----	----	----	**0.286**	ND<10	**57**	**180**	ND<1.0	**370**	**0.37**	**0.57**	**0.023**	ND<0.20
MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses			**----**	**----**	**----**	**----**	**2,000**		**----**	**----**	**----**	**----**	**----**	**----**	**----**	**----**	**----**	**----**	**----**	**----**	**1**	**5**	**5**
MTCA Method B Soil Cleanup Levels for Unrestricted Land Uses			**18**	**6,400**	**800**	**16,000**	**----**		**NVE**	**NVE**	**Cl = 32.3**	**1,600**	**TEF = 0.137**	**0.5**	**7.3 (BG)**	**80**	**120,000**	**240**	**3,000**	**2.09**	**----**	**----**	**----**

Notes:

All results and detection limits are given in milligrams per kilogram (mg/kg); equivalent to parts per million (ppm).

Sample Depth = Soil sample depth interval in feet below ground surface (bgs) after surface cover and/or landscaping material was removed.

BTEX (benzene, toluene, ethylbenzene, and xylenes) determined using EPA Test Method 8260B.

Diesel and Oil TPH (total petroleum hydrocarbons) determined using Northwest Test Method NWTPH-Dx.

EPH (extractable petroleum hydrocarbons) determined using EPA Test Method Northwest Total Petroleum Hydrocarbons for EPH. Results indicate heavy oil with an effective reported carbon range for aliphatics and aromatics from 16 to 34.

Hexane determined using EPA Test Method 8021B.

Cl (chloroform) and VOCs (volatile organic compounds) determined using EPA Test Method 8260B.

Naph. (naphthalene) determined using EPA Test Method 8270D SIM.

cPAHs (carcinogenic polycyclic aromatic hydrocarbons) determined using EPA Test Method 8270D SIM.

PCBs (polychlorinated biphenyls) determined using EPA Test Method 8082 and 8082A.

Total MTCA Metals (As = arsenic, Cd = cadmium, Cr = chromium, CrVI = hexavalent chromium, Pb = lead, Hg = mercury) determined using EPA Method 200.8, 1631E, 6010B and 3051.

TCLP (toxicity characteristic leaching procedure) Metals determined using EPA Test Method 1311 and 6010D.

ND = Not detected at noted analytical detection limit.

---- = Not analyzed or not applicable.

NVE = No value established.

BG = Established Method B Cleanup level exceeds regional background concentrations, therefore the regional background concentration is used.

TEF = Toxicity Equivalency Factor per WAC 173-340-708(8).

Cleanup level listed for chromium (Cr) is for trivalent chromium, analyses are for total chromium in this column.

Bold results indicate concentrations (if any) above laboratory detection limits.

Bold and yellow highlighted results indicate concentrations (if any) that exceed selected soil cleanup levels.

Property Account Summary

9/26/2018

Parcel Number	28061800206800	Property Address	413 MAPLE AVE , SNOHOMISH, WA 98290-2527

General Information

Property Description	Section 18 Township 28 Range 06 Quarter NW THE N 100FT OF FDT BEG INT N LN FOURTH ST AND WLY R/W LN BNRR (AKA NPRR) TH W 148FT TH N 240FT TH E 148FT TH S 240FT TO POB LESS PTN TO CITYSNO PER DEED &DEDICATION 1660/1864 AUD'S FILE NO. 8002280227 DAF BEG NW COR ABV DESC PROP TPB TH S 240FT TH E 10FT TH NWLY TO TPB
Property Category	Land and Improvements
Status	Active, Host Other Property, Locally Assessed
Tax Code Area	00735

Property Characteristics

Use Code	649 Other Repair Services NEC
Unit of Measure	Acre(s)
Size (gross)	0.34

Related Properties

0235317 is Located On this property

Parties

Role	Percent	Name	Address
Taxpayer	100	KLETT STEPHEN & JANET	14430 44TH ST NE, LAKE STEVENS, WA 98258-8614 United States
Owner	100		PALMER MICHAEL S 14430 44TH ST NE, LAKE

		KLETT STEPHEN & JANET	STEVENS, WA 98258 United States

Property Values

Value Type	Tax Year 2018	Tax Year 2017	Tax Year 2016	Tax Year 2015	Tax Year 2014
Taxable Value Regular	$469,000	$455,500	$431,000	$418,500	$412,500
Exemption Amount Regular					
Market Total	$469,000	$455,500	$431,000	$418,500	$412,500
Assessed Value	$469,000	$455,500	$431,000	$418,500	$412,500
Market Land	$251,900	$244,600	$225,300	$215,400	$215,400
Market Improvement	$217,100	$210,900	$205,700	$203,100	$197,100
Personal Property					

Active Exemptions

No Exemptions Found

Events

Effective Date	Entry Date-Time	Type	Remarks
No Events Found			

Tax Balance

Interest and Penalty are due if paying after due date since web is available regardless of holidays or weekends. eCheck and Credit Card payments require interest and penalty after due dates. If unable to make payment by due date because of site maintenance; payment must be postmarked by the next business day per RCW 1.12.070. If you wish to pay taxes online, select an option and click "Add To Payment List". If property is in “Foreclosure” or you are calling about a Special Assessment (not Surface Water, Soil, or Forest Fire) – Call (425) 388-3366. Make Check/Money Order to "Snohomish County Treasurer". Send to Snohomish County Treasurer, 3000 Rockefeller Ave, M/S 501, Everett, WA 98201

Installments Payable

Tax Year	Installment	Due Date	Principal	Interest, Penalties and Costs	Total Due	Cumulative Due	Select to Pay
2018	2	10/31/2018	$3,186.87	$0.00	$3,186.87	$3,186.87	Select

Add To Payment List

View Detailed Statement — Detailed information about taxes and all other charges displayed above.

Calculate Future Payoff — Taxes, interest and penalty due on a specific future date.

Installments Payable/Paid for Tax Year(Enter 4-digit Year, then Click-Here):
2018

Distribution of Current Taxes

District	Rate	Amount	Voted Amount	Non-Voted Amount
CITY OF SNOHOMISH	0.84	$395.04	$0.00	$395.04
FIRE DISTRICT 04	1.66	$778.53	$175.17	$603.36
PUB HOSP #1	0.27	$127.21	$0.00	$127.21
SNO-ISLE INTERCOUNTY RURAL LIBRARY	0.38	$178.05	$0.00	$178.05
SNOHOMISH COUNTY-CNT	0.79	$370.98	$0.00	$370.98
SNOHOMISH LIBRARY CAP FAC AREA	0.07	$30.93	$30.93	$0.00
SNOHOMISH SCHOOL DIST NO 201	6.72	$3,151.13	$3,151.13	$0.00
STATE	2.85	$1,335.84	$0.00	$1,335.84
SNOHOMISH CONSERVATION DISTRICT		$6.02	$0.00	$6.02
TOTAL	13.58	$6,373.73	$3,357.23	$3,016.50

Pending Property Values

Pending Tax Year	Market Land Value	Market Improvement Value	Market Total Value	Current Use Land Value	Current Use Improvement	Current Use Total Value
2019	$257,900.00	$216,100.00	$474,000.00	$0.00	$0.00	$0.00

Levy Rate History

Tax Year	Total Levy Rate
2017	13.321340
2016	13.742095
2015	14.351718

Real Property Structures

Description	Type	Year Built	More Information
SEA-ALASKA INDUST ELECTRIC	Commercial	1975	View Detailed Structure Information

Receipts

Date	Receipt No.	Amount Applied to Parcel	Receipt Total
05/02/2018 00:00:00	9995637	$3,186.86	$6,373.73
11/01/2017 00:00:00	9704733	$3,036.45	$3,036.45
05/08/2017 00:00:00	9454668	$3,036.44	$6,072.89
10/25/2016 00:00:00	8981086	$2,963.93	$2,963.93
05/06/2016 00:00:00	8888028	$2,963.93	$5,927.86
10/30/2015 00:00:00	8561609	$3,005.61	$3,005.61
05/01/2015 00:00:00	8318696	$3,005.60	$6,011.21

09/17/2014 00:00:00	7818862	$2,965.21	$2,965.21
05/05/2014 00:00:00	7776016	$2,965.20	$5,930.41
10/10/2013 00:00:00	7305465	$2,958.23	$2,958.23
05/06/2013 00:00:00	7241239	$2,958.23	$5,916.46

Sales History

Sale Date	Entry Date	Recording Date	Recording Number	Sale Amount	Excise Number	Deed Type	Transfer Type	Grantor (Seller)	Grantee (Buyer)	Other Parcels
No Sales History Found										

Property Maps

Neighborhood Code	Township	Range	Section	Quarter	Parcel Map
5106000	28	06	18	NW	View parcel maps for this Township/Range/Section

Printable Version

Planning and Development Services Property Report

About the Property Report

Report Generated On: 2/7/2019 1:45:08 PM

This report contains information regarding the subject property. This information may be useful for land developers, agents, and planners when analyzing potential land use changes.

The information in this report was compiled from the Snohomish County geographic information system (GIS). Data sources include several Snohomish County departments as well as federal, state, and local agencies.

Please note that all information contained in this report is subject to the disclaimer as noted at the bottom of each page and the end of the report.

Larger-sized map images are included at the end of this report.

Significant information that can affect permitting are displayed in red text.

General Location Info

Site Address:	413 MAPLE AVE
City:	SNOHOMISH
Zip:	98290-2527
Tax Parcel Number:	28061800206800
QTR-Sec-Twp-Rng:	NW 18 T28N R 6E
Latitude / Longitude: (NAD83)	Lat=47.916434 Long=-122.088354
WA State Plane North Zone: (NAD83, US Feet)	X=1,332,683.01 Y=336,794.01
County Road Atlas Page:	113

Administrative Info

Land Use Jurisdiction:	City of Snohomish
Tribal Lands Status:	Non-tribal land
Tribal Lands Name:	Non-tribal land

Planning Info

Future Land Use (FLU):	CITY
FLU Description:	Incorporated City
Zoning:	CITY
Zoning Description:	City
QTR-Sec-Twp-Rng:	NW 18 T28N R 6E
Tax Parcel Number:	28061800206800
Urban Growth Area (UGA):	Snohomish UGA
Municipal UGA:	Not in a Municipal Urban Growth Area
Transportation ILA:	MON ILA-7, Estm. Trip% = 10
TDR Sending Area:	Not in a TDR Sending area
TDR Receiving Area:	Not in a TDR Receiving area
Snow Load Factor:	0.053
Snow Load:	To obtain snow load value, turn on 'Snowload' layer in interactive map and click on the area of interest
No-Shooting Area:	Not in a No-shooting Area (SCC 10.12)
Lot Status:	Unconfirmed
SCC 30.23.040 (22) Applies:	Minimum Lot Size does not apply {per SCC 30.23.040(22)}
Transportation Services Area:	C
Mineral Resource Type:	Not in an Mineral Resource area
Mineral Resource Name:	Not in a mineral resource overlay area
Shoreline Management Area:	Not in a Shoreline Management Area

Assessor Info

Tax Parcel:	28061800206800
Owner Name:	KLETT STEPHEN & JANET
Taxpayer of Record: (maintained by Treasurer)	KLETT STEPHEN & JANET
Site Address:	413 MAPLE AVE
City:	SNOHOMISH
Zip:	98290-2527
Use Code:	649 Other Repair Services NEC
Gross Size (acres):	0.34
Land Value:	$257,900
Improvement Value:	$216,100
Total Value:	$474,000
Tax Year:	2019
Assessment Date:	01/01/2018
Property Account Summary:	https://www.snoco.org/proptax/search.aspx?parcel_number=28061800206800
Permit Information:	http://www.snoco.org/app/pds/permitstatus/PDS-ParcelList.aspx?PN=28061800206800

District Info

Council District:	County Council District 5
Fire District:	Fire District 04
Fire Authority:	Not in a Fire Authority area
School District:	Snohomish School District 201
Sewer District:	Not in a sewer district
Water District:	Not in a water district
Water Provider (CWSP):	City of Snohomish
Park District:	Not in a park district
Park Service Area:	Centennial
Drainage District:	Not in a drainage district
Diking District:	Not in a diking district
Flood Control District:	Not in a flood control district

Notification Info

Agriculture Notification Area:	Not within an agriculture notification area
Lahar Volcanic Notice (200 ft):	Not in a lahar hazard area
Commercial Forrest Notice (500 ft):	Not within 500 ft of a commercial forest
Mineral Resource Notice (2000 ft):	Not within 2,000 ft of a Mineral Resource Overlay area
Paine Field Airport:	Not within 20,000 ft of Paine Field
Airpark:	No airparks within 2500 ft
Airport Compatibility Area:	Not within an airport compatibility area
Airport Influence Area:	Not within an airport influence area

Critical and Physical Info

Watershed Name:	Snohomish watershed
Aquifer Sensitivity:	Moderate Aquifer Sensitivity
Elevation: (NAVD88, US Feet)	Approximately 76.2 to 78.4 ft
Sub-basin Name:	Fobes Hill sub-basin
Hydric Soils:	No hydric soils Hydric soils present
Basin Name:	Snohomish
Flood Hazard Area:	Parcel is outside the flood hazard area
Sole Source Aquifer:	Not in a sole source aquifer
Water Resource Inventory Area:	WRIA 7
Flood Plain 100yr:	n/a
Critical Aquifer Recharge Area:	Not in a critical aquifer recharge area
Geology (erodible surface):	Alluvium
Soil Type:	TOKUL GRAVELLY LOAM, 0 TO 8 PERCENT SLOPES
National Wetlands Inventory:	No NWI wetlands present
Wetlands (Snoco):	No PDS wetlands present
Wetlands Last Edited:	No PDS wetlands present
Steep Slopes (> 33%):	Steep slopes not detected
Landslide Hazard Area:	Not within a known landslide and outside the modeled LHA area — More Information: SCC 30.62B.340
Mine Hazard:	No mines within 200 feet
Pipelines:	No petroleum pipelines within 1,000 feet
Levees:	No levees within 1,000 feet
Levees Source:	No levee on the property
Data Compiled On:	02/06/2019

Parks (within 1/2 mile)

Pilchuck
Centennial Trail

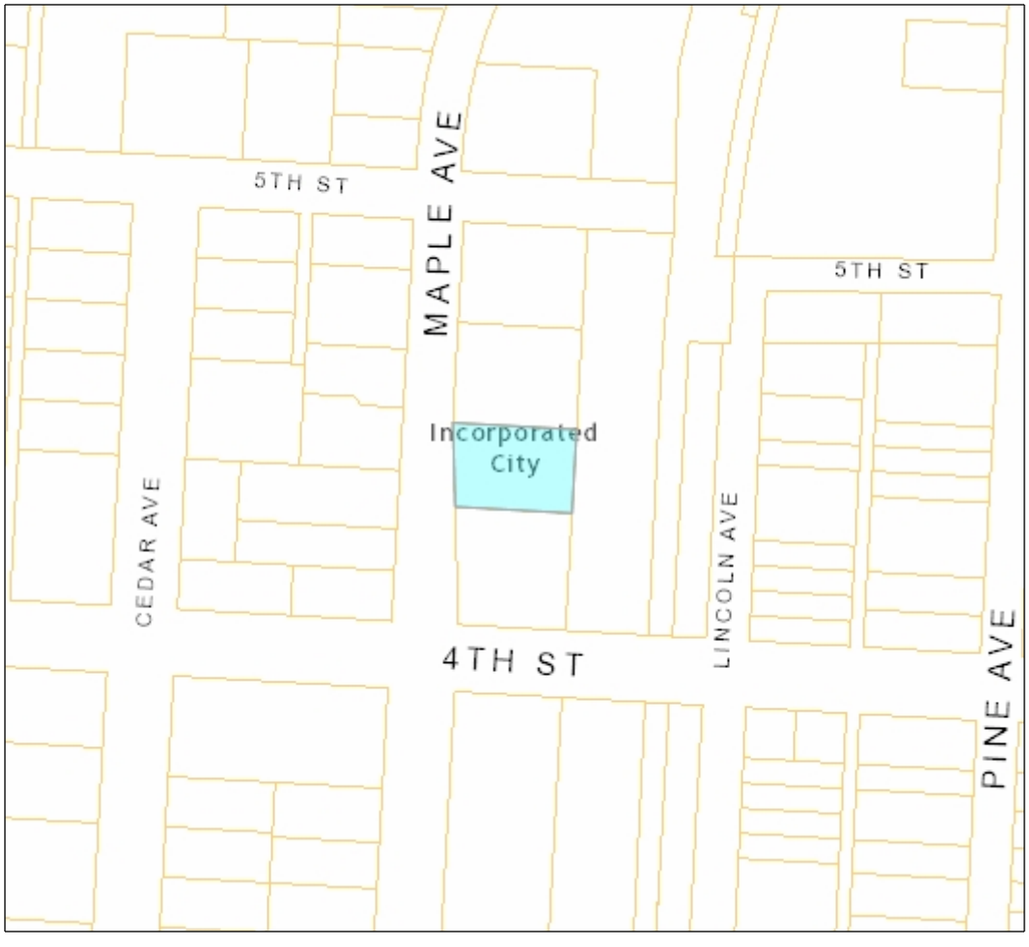
Schools (within 1/2 mile)

Central Primary Center
Snohomish Freshman Campus

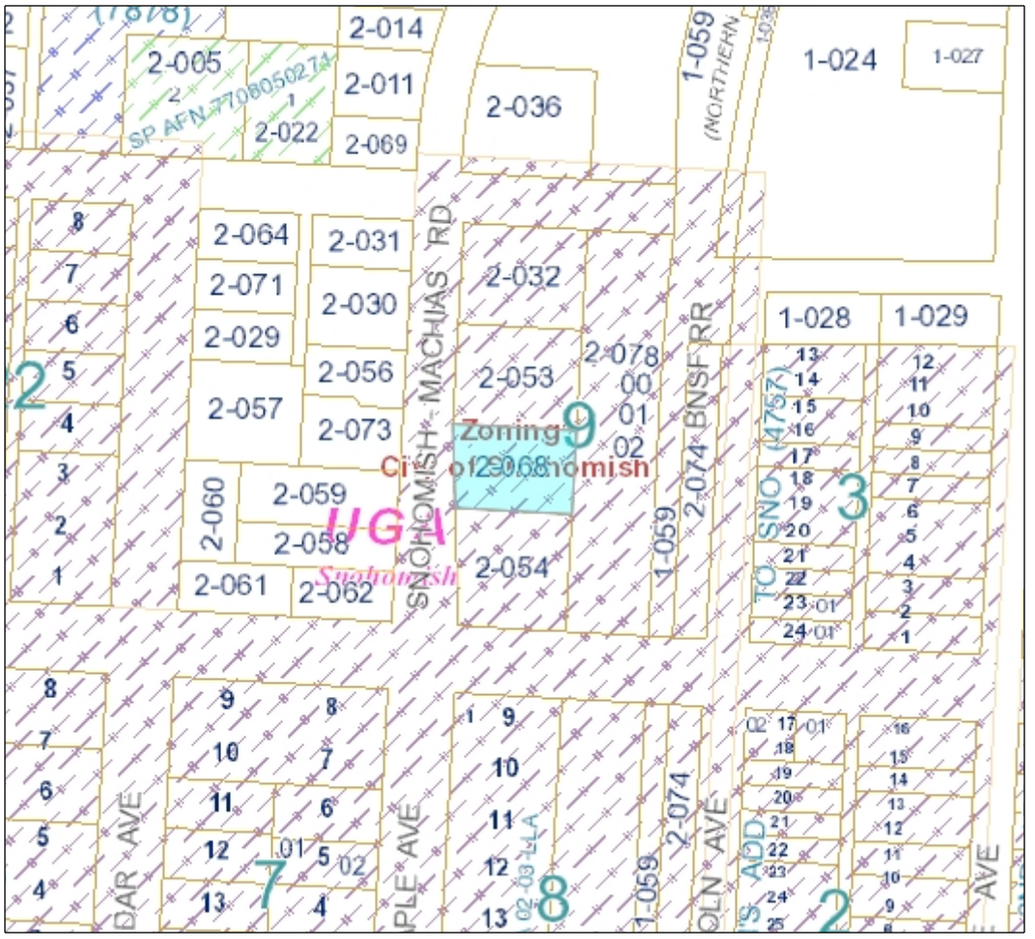
Bus Stops (within 1/2 mile)

Ave D & Third St
Ave D & Fifth St
Ave D & Fifth St
Ave D & Third St
Second St & Ave A
Second St & Ave C
Second St & Maple Ave
Second St & Pine Ave
92nd St SE & 113th Dr SE
Second St & Ave C
Second St & Maple Ave
Second St & Pine Ave
Second St & Ave A
92nd St SE & 113th Dr SE

Future Land Use Map



Zoning Map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2-005
2-011
2-036
2-022
2-069
1-059
1-024
1-027
2-064
2-031
2-032
2-071
2-030
2-029
2-056
2-053
2-078
2-057
2-073
Zoning
City of Snohomish
2-059
2-060
2-058
2-061
2-062
2-054
1-028
1-029
SNOHOMISH RD
2-074 BNSF RR
1-059
SNO (4757)
DAR AVE
PLE AVE
OLN AVE
AVE

2015 Aerial Photo Map

Dec. 1905
SNOHOMISH
WASH.

6

504

505

PINE

503

502

4TH

3D

RAILROAD

NORTHERN PACIFIC RY. MAIN TRACK

PLATFORM

N.P.R.R. DEPOT

RAILROAD RESERVATION

10

309

FRANK FRIESE'S FEED MILL

308

LAKE

23

307

SPRING

5

SCALE OF FEET.

Nov. 1908
SNOHOMISH
WASH.

8

504

505

PINE

503

502

RAILROAD

RAILROAD RESERVATION

N.P.R.R. DEPOT

309

SNOHOMISH FEED MILL

308

LAKE

307

23

CREEK

BRIDGE

SPRING

Scale of Feet.

12

1954

SNOHOMISH, WASH
NOV. 1908

8

WASH

GREEN HO.

504

505

PINE

503

502

12

LINCOLN
(RAILROAD)

MAIN TRACK

N.P.R.R. DEPOT

RAILROAD RESERVATION

309

SNOHOMISH FEED MILL

308

4TH

3RD

MAPLE
(LAKE)

23

307

Scale of Feet.

CEDAR

PHASE II ENVIRONMENTAL SITE ASSESSMENT & GEOTECHNICAL ENGINEERING EVALUATION

4th Street & Maple Avenue
Snohomish, Washington
HWA Project No. 2006-032-22

Prepared for
City of Snohomish

May 17, 2006

HWA GEOSCIENCES INC.

- *Geotechnical Engineering*
- *Hydrogeology*
- *Geoenvironmental Services*
- *Inspection & Testing*

HWA GEOSCIENCES INC.
Geotechnical & Pavement Engineering · Hydrogeology · Geoenvironmental · Inspection & Testing

May 17, 2006
HWA Project No. 2006-032-22

City of Snohomish
116 Union Avenue
Snohomish, WA 98290

Attention: Brad Nelson

Subject: **REPORT**
PHASE II ENVIRONMENTAL SITE ASSESSMENT AND GEOTECHNICAL ENGINEERING EVALUATION
4th Street and Maple Avenue, Parcel No. 28061800207800
Snohomish, Washington

Dear Mr. Nelson,

Enclosed is a copy of the Phase II Environmental Site Assessment and Geotechnical Engineering Evaluation report for the above parcel in Snohomish, Washington.

We appreciate the opportunity to provide professional services on this project. Please call if you have any questions.

Sincerely,

HWA GEOSCIENCES INC.

Vance Atkins, LG, LHG
Senior Hydrogeologist

Arnie Sugar, LG, LHG
Vice President

Brian E. Hall, P.E.
Senior Geotechnical Engineer

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES (FOLLOWING TEXT)

APPENDICES

PHASE II ENVIRONMENTAL SITE ASSESSMENT AND GEOTECHNICAL ENGINEERING EVALUATION 4TH STREET AND MAPLE AVENUE SNOHOMISH, WASHINGTON

1.0 INTRODUCTION

This report presents the results of the HWA GeoSciences Inc. (HWA) Environmental Site Assessment and Geotechnical Engineering Evaluation conducted for the City of Snohomish (Snohomish) at a site in Snohomish, Washington (subject property).

1.1 SITE LOCATION AND DESCRIPTION

The site occupies approximately 1.27 acres east of the intersection of 4th Street and Maple Avenue, in Snohomish, Washington, tax parcel No. 28061800207800. The subject property was occupied by a Northern Pacific Railroad (NPRR) siding and switches since at least the early 1900's. The property is currently vacant, and the rails have been partially removed from the property. We understand Snohomish plans to develop the property as a senior activity center, senior housing, and parking areas for the senior center and adjacent proposed Snohomish Trail Corridor foot trail. Figures 1 and 2 show the subject property location and site plan. Appendix A contains photographic documentation of the site.

The site is relatively flat. It is surrounded by railroad tracks followed by residential development to the east, commercial development to the north and west, and a library to the south. The site is open to access and, at the time of HWA's March, 2006 fieldwork, easily accessible by foot, except for one partially overgrown section on the north end.

Two piles of suspected petroleum-containing soils (PCS) are located in the northwestern portion of the site. These soils were reportedly transported to the site by a remediation contractor, with the intent of on-site bioremediation. The status and petroleum concentrations of these soils were unknown. They are partially overgrown with blackberry and other undergrowth.

1.2 SCOPE OF WORK

1.2.1 Phase II Environmental Site Assessment

A Phase I Environmental Site Assessment (ESA) has not been conducted at this site to our knowledge. Therefore HWA proposed a general approach for site sampling and analysis.

HWA's scope of work for this project was designed to investigate the potential presence of surficial soil contamination that may present liability issues, health and safety concerns, or require additional investigation or remediation costs. The scope of work is summarized below:

- Prepare project work plan, and health and safety plan
- Review historical Sanborn fire insurance maps and other available environmental reports
- Perform electromagnetic survey to search for potential USTs
- Advance and sample backhoe test pits
- Collect soil samples
- Perform laboratory analyses on selected soil samples
- Prepare the Site Assessment Report

1.2.2 Preliminary Geotechnical Investigation

In conjunction with the Phase II environmental investigation HWA conducted a preliminary geotechnical engineering study to provide geotechnical design parameters for the proposed structures. This study included the following tasks:

- Review available geotechnical and geologic data for the project area.
- Evaluate subsurface conditions at the site with backhoe test pits.
- Perform laboratory tests on selected soil samples to determine relevant engineering and index properties of the on site soils.
- Perform engineering analyses and evaluate data derived from the subsurface exploration program
- Provide geotechnical engineering recommendations for site preparation, building foundations, seismic considerations, and subsurface drainage.

1.3 HISTORICAL DOCUMENT REVIEW

1.3.1 Sanborn Insurance Maps and City Directories

HWA evaluated selected historical Sanborn fire insurance maps of the subject property and surrounding areas from 1905 to 1954 (URS, 2003). These maps are included in Appendix B. The findings are summarized below:

1905 – The subject property is depicted as part of the NPRR 'railroad reservation" with three siding tracks running approximately north-south through the property. A small structure, possibly an ancillary building for the railroad, is located at the southern end of the subject property. The building is denoted as 'vacant.' The property is bounded to the east by the NPRR railroad, followed by apparent residential development. Properties to the west are developed as a feed mill and residential development. The feed mill is noted to have steam power (possibly a boiler). Adjacent properties to the north are not included on the available map.

1908 – The subject property is essentially unchanged, except the small building near the south property line is no longer present, and a second building has been constructed approximately 200 feet north of 4th Avenue along the west property boundary. No significant changes are noted in the subject property vicinity.

1954 - The subject property is essentially unchanged, except the building near the west property line is no longer present, and a second building has been constructed approximately 300 feet north of 4th Avenue along the west property boundary. The building is denoted as 'vacant.' Gas and oil storage is noted at the feed mill site adjacent west of the subject property. No other significant changes are noted in the subject property vicinity.

1.3.2 URS Corporation Targeted Brownfields Phase I Report

URS Corporation (URS) performed a Phase I Environmental Site Assessment (ESA), dated August 15, 2003, on behalf of the U.S. Environmental Protection Agency (USEPA). The purpose of the ESA was to document known or suspected environmental concerns associated with current or historical land use on or adjacent to the proposed Snohomish Trail Corridor. The subject property is adjacent to Segment 'D' of the proposed trail (URS, 2003). URS identified the following recognized environmental conditions (RECs) associated with the trail segment:

- The trail (including the subject property) is located on a former railway track and sidings and the potential exists for environmental impact from contaminated fill or ballast, railway ties, and/or spills from railway containers.

- Central Feed Mills, located southwest of the subject property was the subject of an environmental investigation and cleanup as a result of on-site petroleum and hazardous materials use and storage, which led to historical releases. The investigation and cleanup was associated with the redevelopment of the property as the Sno-Island Regional Library. Soils underlying the former mill were cleaned up during this redevelopment. Soil samples collected from test pits completed underlying the adjacent rail spur contained concentrations of petroleum hydrocarbons, lead, and polycyclic aromatic hydrocarbons (PAHs) above applicable cleanup levels.
- Other feed mill sites (Section 1.3.1, above) were listed as a concern based on the findings of the Central Feed Mills site.

1.3.3 URS Corporation Targeted Brownfields Phase II Report

URS performed a Phase II ESA dated October, 2004 on behalf of the USEPA to provide limited sampling data for selected locations along the proposed trail corridor. Direct-push borings were completed and soil samples were collected. One boring (GP-7) was located on the east subject property boundary to assess soil conditions in fill and underlying soils adjacent to the railway (Figure 2).

URS analyzed soil samples collected from one to six feet below ground surface (bgs) for semivolatile organic compounds (SVOCs), PAHs, metals, and petroleum hydrocarbons. At boring GP-7, SVOCs, PAHs, and petroleum hydrocarbons were either not detected, or were detected at concentrations well below applicable cleanup levels. Lead was detected at a concentration of 303 milligrams per kilogram (mg/kg) in a soil sample collected from 0 to 2 feet bgs. The concentration is above the Washington Department of Ecology (Ecology) Model Toxics Cleanup Act (MTCA) cleanup level of 250 mg/kg. Metals were either not detected, or were detected at concentrations below applicable cleanup levels in the remaining samples. The shallow soil sample was one of three locations where metals were detected at concentrations above cleanup levels.

1.4 Site Walk and Electromagnetic Survey

On March 16, 2006, HWA performed a site walk to observe site conditions and performed a limited electromagnetic survey to assess the potential for the presence of unknown USTs or other features associated with previous structures and site use. HWA traversed the site with a magnetic gradiometer to attempt to locate any large buried ferrous metal objects (i.e., USTs). Due to the presence of rail tracks and abundant metal debris, numerous spurious readings were obtained and no areas were identified as likely containing potential USTs. Based on historical site use, USTs may be present, and should be planned for as a contingency during site construction.

The site is currently undeveloped, with remnants of railway spurs running north-south through the property. The northern portion of the site is graveled and used for parking of truck trailers. Graveled areas were also noted along the southern portion of the property, adjacent to 4th Street.

HWA traversed the suspect PCS stockpiles in the northwest portion of the site. The stockpiles were partially overgrown, but the northern portion of the stockpile showed signs of disturbance, such as removal of soils with a backhoe. A subsequent site visit found two unused steel tanks on the west side of the stockpiles. The tanks appeared to be an unused UST and an unused above-ground storage tank, which were likely brought to the site along with the PCS from the UST removal project. The tanks were approximately six feet long and 3.5 feet in diameter (Appendix A). The tanks were in good condition and did not appear to have holes or significant corrosion. One tank was found to have approximately six inches of oil and sludge in the base. Releases from the tank to the surrounding soils were not observed.

2.0 SAMPLE LOCATIONS AND METHODS

On March 21, 2006, HWA completed eight test pits at selected locations on the subject property. The test pit locations were selected based on the historical document review, as well as to provide soil observations, documentation, and sampling for a geotechnical assessment for proposed construction and structures at the property (discussed below).

HWA also collected five samples of stockpiled soils at the site for characterization purposes (see Figure 2). The sample locations and rationale are summarized below on Table 1.

TABLE 1
SAMPLE LOCATIONS

Test Pit ID	Location (Measured from approximate property corners)	Sample Location Rationale (Environmental/Geotechnical)
TP-1	45ft N/25 ft E of SW corner	Potential historical upgradient source (former feed mill)/proposed driveway
TP-2	160 ft N/30 ft E of SW corner	Potential historical upgradient source (former feed mill)/proposed parking area
TP-3	230 ft N/150 ft E of SW corner	Fill and soil conditions/proposed parking area
TP-4	270 ft N/60 ft E of SW corner	Fill and soil conditions/proposed residential building
TP-5	100 ft S/90 ft E of NW corner	Fill and soil conditions/proposed parking area
TP-6	180 ft S/95 ft E of NW corner	Fill and soil conditions/proposed parking area
TP-7	130 ft N/85 ft E of SW corner	Fill and soil conditions/proposed activity center building
TP-8	45 ft N/80 ft E of SW corner	Fill and soil conditions/proposed activity center building

2.1 SOIL SAMPLE COLLECTION

HWA retained ClearCreek Contractors of Everett, Washington to excavate the test pits using a small track-mounted excavator. HWA collected 12 soil samples from eight test pits (TP-1 through TP-8) located throughout the subject property. The test pits were completed to depths of up to 8 feet bgs. HWA sampled soils at depths of ranging from 1.5 to 8 feet bgs.

HWA conducted field screening of soil for the presence of volatile organic vapors using a Mini-Rae PGM 75 photoionization detector (PID). Visual indications of contamination and odor were also noted. Although the PID is not capable of quantifying or identifying specific organic compounds, this instrument is capable of measuring relative concentrations of a variety of organic vapors with ionization potentials less than the energy of the ultraviolet source (in this case, 10.6 eV). The PID is useful for providing qualitative information with respect to the presence and relative concentration of organic vapors. PID readings are shown on the boring logs.

The PID was calibrated with 100 parts per million isobutylene standard at the beginning of the day. Fifty to 100 milliliters of soil from a discrete depth were placed in a plastic bag, sealed, and permitted to sit at least 10 minutes prior to analyzing the vapor in the sample bag. The bag was then perforated by the PID sample tip to obtain the reading. Samples were screened with the PID when sufficient sample volume was available. Exact depths of field PID sample screening and concentration values were recorded on the boring logs. All sampling locations were field screened using a PID. No elevated PID readings were detected.

HWA used decontaminated stainless steel scoops to collect the soil samples from the excavator bucket. Soil samples were placed in labeled laboratory-supplied precleaned 8-oz. sample jars. Samples were placed in a cooler with blue ice for transport to the laboratory under chain-of-custody protocols.

Based on field screening and observations, HWA selected six soil samples from selected test pits for laboratory analysis.

Figure 2 shows the sampling locations. Appendix C contains the test pit logs. The laboratory analyses are summarized on Table 2 and Appendix D contains the laboratory analytical reports.

2.2 SOIL STOCKPILE SAMPLE COLLECTION

HWA also collected five stockpile samples (SP-1A through SP-1E) from the stockpiled soils on the subject property. Trenches were excavated in the stockpiled soils for observations and field screening. The trenches were completed to depths of up to four feet, dependent upon the thickness of the piles at that location. All sampling locations were field screened using a PID. Petroleum hydrocarbon odors were noted in three stockpile samples (SP-1C, SP-1D, and SP-1E), and elevated PID readings were detected in two samples (SP-1C and SP-1E).

Based on field screening, observations and stockpile volume, HWA selected all five stockpile samples for laboratory analysis.

Figure 2 shows the sampling locations; photographs of the stockpiles are included in Appendix A. The laboratory analyses are summarized on Table 2 and Appendix D contains the laboratory analytical reports.

3.0 SAMPLE ANALYSES

CCI Analytical Laboratories of Everett, Washington, analyzed the samples for PCBs, metals, and total petroleum hydrocarbons in the diesel/oil range, by using the following test methods:

- Washington state total petroleum hydrocarbons in the diesel-range extended (method NWTPH-Dx)
- PCBs using U.S. Environmental Protection Agency (EPA) method 8082; and
- Total MTCA Metals (arsenic, cadmium, chromium, lead, and mercury) by EPA method 6010B/7471A; and

Appendix D contains the complete laboratory analytical packages, including chain-of custody forms.

3.1 QUALITY CONTROL REVIEW

HWA reviewed quality assurance results of the analytical data. Laboratory QC included analysis of method blanks, trip blanks, and surrogate samples. These analyses provide information about accuracy, precision, and detection limits.

All samples were extracted and analyzed within holding times. Laboratory method blank analyses were all below detection limits.

Surrogate recoveries, method blanks, laboratory duplicates, spike blanks, and spike blank duplicates were all within control limits.

The analyses of the six soil samples and five stockpile samples collected on March 21, 2006 were determined to be acceptable for their intended use.

4.0 RESULTS

4.1 SUBSURFACE CONDITIONS

Test pit soil logs are included in Appendix C and photographs of soil conditions are included in Appendix A. According to the geologic map of the area (Minard, 1985), the surficial soils in the subject property vicinity consist of alluvium of Holocene age. The alluvium is described as occurring as terrace-like deposits consisting of mostly clean, oxidized medium to coarse-grained sand and gravel.

Based on the test pits completed at the site, surficial soils consisted of fill material. This material was primarily dark gray to black silty sand; however, the fill contained a significant amount of apparent cinder or burned material and some construction debris (brick), possibly associated with railroad activities at the site. This fill ranged in thickness from 1.25 feet at the southwestern corner of the site (TP-1), to a maximum observed thickness of 4 feet in the northeastern portion of the site (TP-5). Based on the observed depth and extent of the cinder material in test pits, the volume of fill material on the property is estimated to be approximately 4,700 to 6,000 cubic yards. Because this fill may be associated with railroad development this layer likely extends beyond the subject property to the north and south, and may be an area-wide issue.

A concrete slab was discovered in the northwest portion of the site (north of the PCS stockpile). This slab may be associated with a former structure on the property. The extent of the slab was not determined. Asphalt was found in the southeast portion of the site. This may have been associated with former parking or railway spur activities. The extent of the asphalt was not determined.

Underlying the fill material is a yellowish gravelly silt layer. The silt may be fill, or may be associated with the underlying alluvial materials, such as a terrace deposit. The silt ranged from approximately one foot in thickness (TP-1) to three feet (TP-5). The silt did not appear to be present, or very thin, at test pit TP-2, along the west-central portion of the site.

This study did not include any ground water sampling, and is therefore unlikely to assess any ground water impacts from on site historical activities or off site impacts from adjoining sites.

5.1.1 Construction Recommendations

Petroleum and metals contaminated soil may be encountered during future excavation in this area. Construction bid documents (plans and specifications) should include all analytical results and provisions for contaminated soil handling, treatment/disposal, and health and safety requirements.

Soil excavated for construction that does not contain contaminants exceeding cleanup levels may still require treatment or disposal at a licensed facility, as most fill sites will not accept soils with detectable concentrations of contaminants. MTCA cleanup levels are used in this report for reference only, and normally apply to soils being excavated for the purpose of remediation. If fill excavated for geotechnical reasons is disposed on or off-site as "unsuitable soil", property owners at the receiving site should be notified of the results of this study and any additional testing information available at that time. Criteria for unrestricted use of soils may be lower than the cleanup levels shown. Soils with contaminant concentrations above detection limits but below cleanup levels should not be used as fill near surface or ground water, and may not be accepted at fill sites.

5.1.2 Cleanup levels

Analytical results were compared to MTCA cleanup levels, as a screening level evaluation of the environmental quality of the subject property. Method A values are intended to be protective of all exposure pathways, but are only provided for a limited list of contaminants and are typically applied at voluntary or routine cleanups. MTCA states that the Method A values "*should not automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in this table do not necessarily mean the soil/water must be restored to these levels at a site*". These cleanup levels may not apply at this site, and do not necessarily trigger any cleanup action.

Additionally, two abandoned tanks, possibly associated with the PCS, were observed at the site. These tanks should have any residual petroleum removed, be cleaned, and transported to an off-site recycling facility for disposal to prevent potential releases to the environment.

Alluvial sands and gravels, as described by Minard (1985) were observed at depths of 2.5 feet and greater in all test pits. The soils consisted of coarse poorly-graded sand with gravel. Oxidation on soil particles was observed. The sidewalls of the test pits often exhibited sloughing or caving at depths of six feet bgs. Test pits were typically bottomed at 6 to 8 feet bgs. Ground water was not encountered in any of the test pits.

4.2 Analytical Results

Soil petroleum hydrocarbon, metals, and PCB analytical results are summarized in Table 2.

TABLE 2
SOIL ANALYTICAL DATA
(all results in milligrams per kilogram (mg/kg) except as noted)

Sample	TP-1-6	TP-2-6	TP-3-1.5	TP-3-6	TP-4-1.5	TP-5-3	TP-5-6	TP-6-1.5	SP-1A	SP-1B	SP-1C	SP-1D	SP-1E	Background *	MTCA A
Sample description	Brown sand and gravel	Brown sand and gravel	Dark gray sand/debris	Brown sand and gravel	Dark gray sand/debris	Dark gray sand/debris	Brown sand and gravel	Dark gray sand/debris	Brown silty sand	Gray to dark gray silty sand	Gray to brown silty sand	Gray to brown silty sand	Gray to brown silty sand		
Depth (feet bgs)	6	6	1.5	6	1.5	3	6	1.5	--	--	--	--	--		
Petroleum Hydrocarbons and Aromatics															
HCID			ND		ND	ND		ND							
Gasoline									<3	<3	**690**	6	**610**		100/30**
Diesel	<25	<25							<25	<25	180	74	290		2000
Lube oil	<50	<50							140	120	220	150	270		2000
Benzene									<0.03	<0.03	<0.3	<0.03	<0.03		0.03
Toluene									<0.05	<0.05	1.0	<0.05	0.16		7
Ethylbenzene									<0.05	<0.05	4.0	<0.05	1.1		6
Xylenes									<0.2	<0.2	3	<0.2	1.7		9
Total Metals															
Arsenic			8.0		9.3	<6		6.8						7	20
Cadmium			0.54		<0.30	<0.34		<0.27						1	2
Chromium			9.0		14	7.5		11						48	2000/19***
Lead			**340**	2.6	160	**700**	15	160						24	250
Mercury			0.06		0.06	0.05		0.03						0.07	2
Polychlorinated Biphenyls															
Aroclor 1016													<0.1		1
Aroclor 1221													<0.1		1
Aroclor 1232													<0.1		1
Aroclor 1242													<0.1		1
Aroclor 1248													<0.1		1
Aroclor 1254													<0.1		1
Aroclor 1260													<0.1		1

MTCA A / B – Department of Ecology Model Toxics Control Act (MTCA) cleanup levels, Chapter 173-340 WAC, Method A / B soil cleanup levels, shown for reference only.

< - not detected at listed reporting limit

Blank – Not Analyzed

Bold – Analyte exceeds cleanup level

* - Natural Background Soil Metals Concentrations in Washington State (Ecology, 1994)

** - gasoline mixtures without benzene & total of ethylbenzene, toluene, & xylene = < 1% of gasoline concentration/all other gasoline mixtures

*** - The Method A soil cleanup levels for Chromium are 19 mg/kg for Cr VI and 2000 mg/kg for Cr III. Analyses are for total chromium.

5.0 SUMMARY AND RECOMMENDATIONS

5.1 ENVIRONMENTAL SUMMARY

Two of the eight test pit soil samples analyzed, TP-3-1.5 and TP-5-3, contained lead concentrations exceeding Department of Ecology Model Toxics Control Act (MTCA) cleanup levels. These samples were collected in shallow fills soils that appeared to contain cinder- or slag-like material. Subsequent analyses of samples collected from native soils underlying the fill material in the two test pits (Samples TP-3-6 and TP-5-6) did not contain elevated lead concentrations. Other shallow soil samples (TP-4-1.5, TP-6-1.5) contained elevated lead concentrations, although the concentrations were below the applicable cleanup level. Other metals analyses did not indicate concentrations above published background concentrations. Based on these results, some of the fill at the site contains elevated lead concentrations; however exceedances appear to be limited, and native soils underlying the fill do not appear to be contain elevated metals concentrations. Additional sampling would be required to define any discrete areas of fill soil containing lead above cleanup levels, if site-wide remediation was desired. Fill soils excavated for geotechnical reasons (i.e., "unsuitable soil") that require off site disposal should be characterized for profiling and be disposed of at a facility licensed to receive metals-containing soils. Results of this study may be accepted by the disposal facility for profiling purposes.

Petroleum hydrocarbons were not detected in any of the selected test pit soil samples. Samples TP-1-6 and TP-2-6 were collected from the southwest corner of the property adjacent to a site that formerly was developed as a feed mill, and on which petroleum use and storage was documented on historical resources. Impacts from potential petroleum releases at that site were not detected in in-place soils on the subject property.

Five soil samples were collected from stockpiled suspected PCS at the subject property. Two samples contained gasoline-range hydrocarbons above MTCA Method A cleanup levels. Diesel and/or lube oil range petroleum hydrocarbons were also detected in all five samples, but at concentrations below applicable cleanup levels. Based on the results of this study, the soil stockpiles should be removed from the site and treated and/or disposed of at facility licensed to accept petroleum contaminated soils. Soils under the stockpiles should be sampled to confirm all impacted soil has been removed.

Analytical results for the remaining soil samples either did not detect the selected analytes, or the analyte concentrations were below applicable cleanup limits.

5.1.3 Reporting Requirements

Pursuant to MTCA regulations (Chapter 173-340-300 WAC), the property owner or operator is required to notify Ecology within 90 days of discovery that an uncontrolled release of a hazardous substance was discovered. This report may be used for reporting purposes. The local Ecology office is:

Washington State Department of Ecology
Northwest Regional Office
3190 160th Ave. SE
Bellevue, WA 98008-5452
(425) 649-7000

5.1.4 Health and Safety

HWA recommends that appropriate health and safety measures be taken during excavation in areas where contaminated soils, ground water, or vapors may be present. These measures may include, but are not limited to, preparation of a site specific health and safety plan, air monitoring, site control/access, protective and decontamination measures, worker training, certification, and medical monitoring. We recommend an industrial hygienist or health and safety specialist be consulted to determine the applicability of these requirements. Construction specifications should include all available analytical results including this and other available reports

5.2 Preliminary Geotechnical Recommendations

The following geotechnical recommendations should be considered preliminary and may be utilized for initial planning purposes. Once the actual site and building plans are developed, we should be contacted to review the plans and these recommendations and assess whether additional explorations, lab testing, and/or analyses are necessary.

5.2.1 Building Foundations

In our opinion, the proposed senior center can be constructed on spread footings bearing on native gravelly sand. The existing fill blanketing the surface is compressible and structures supported on it would be subject to undesirable differential settlements. The underlying gravelly silt is also compressible and foundations should extend below this layer. We recommend that building foundations bear directly on alluvial gravelly sand, or on structural fill (discussed in Section 5.2.5) placed directly over the gravelly sand. Spread footings designed for this condition may be proportioned for an allowable soil bearing pressure of 3,000 pounds per square foot (psf). This value may be increased by 1/3 (to 4,000 psf) for short-term transient loading conditions, such as wind or seismic loading.

Although the alluvial gravelly sand at the site is relatively permeable, and water would not be anticipated to pond adjacent to foundations or beneath floor slab areas, it is considered prudent to provide for a perimeter drainage system to ensure positive drainage of foundations and floor slab areas. Building and site drainage recommendations are presented in Section 5.2.7 of this report.

Although our scope of work included provision of recommendations for site or basement retaining walls, it is our current understanding that no retaining walls will be utilized for the project. If this should change, we should be contacted to provide appropriate design and construction recommendations.

5.2.2 Concrete Slabs on Grade

Concrete slabs-on-grade may be constructed over the existing site soils in the following manner. The slab subgrade should be prepared by sub-excavating at least 6 inches of existing surficial materials and evaluating the exposed subgrade. The exposed subgrade should then be compacted with a smooth drum vibratory roller. If soft/yielding, organic-rich, or otherwise unsuitable materials are exposed, they should be sub-excavated to the depth and extent recommended by the geotechnical consultant, and the sub-excavations replaced with compacted structural fill. After the subgrade has been prepared in this manner, a 6-inch thick (minimum) pad of crushed surfacing base course (CSBC) should be placed and compacted over the prepared subgrade. A 6-inch thick layer of capillary break material, such as pea-gravel or similar clean, open-graded granular material should be placed over the CSBC pad. A vapor barrier should be placed over the capillary break layer.

5.2.3 Seismic Design Considerations

We anticipate new structures will be designed in accordance with the 2003 International Building Code (IBC, 2002). For the site location, the design maximum considered earthquake spectral response acceleration at short periods, S_s, is 1.12g. The design maximum considered earthquake spectral response acceleration at 1 second period, S_1, is 0.38g. For seismic design in accordance with Section 1615.1 of the IBC, the Seismic Site Class is required. The alluvial gravel encountered in our test pits classifies as Seismic Site Class D soil. However, the Seismic Site Class is determined based on the average properties in the upper 100 feet. Where subsurface properties are not known in sufficient detail to determine the Seismic Site Class, IBC requires that Site Class D be used. Given the available subsurface information, Site Class D should be used for seismic design.

Soil liquefaction is a phenomenon wherein loose, saturated, granular deposits temporarily lose strength and behave as a liquid in response to moderate to strong earthquake shaking. However, ground water was not encountered in our shallow test pits and, based on our review of well logs in the vicinity listed with the Department of Ecology, the

ground water table is likely to be at least 20 feet below the site. For this site, with an unsaturated crust at least 20 feet thick, soil liquefaction does not represent a design consideration, in our opinion.

5.2.4 Temporary Excavations

We anticipate that the on site soils can be excavated using conventional excavation equipment such as backhoes and trackhoes. However, because of the history of the site, the contractor should be prepared to encounter oversize obstructions when excavating the fill.

Although not currently anticipated, temporary cuts in excess of 4 feet in height should be sloped in accordance with Part N of Washington Administrative Code (WAC) 296-155, or shored. The existing fill and alluvial soils classify as Type C Soil; temporary unsupported excavations in Type C Soils must be inclined no steeper than 1.5H:1V. The recommended maximum inclinations for temporary slopes assumes that the ground surface behind the slope is level and surface loads from equipment and materials are kept a sufficient distance away from the top of the slope. Flatter slopes may be required where ground water seepage is present.

With time and the presence of seepage and/or precipitation, the stability of temporary unsupported cut slopes can be significantly reduced. Therefore, all temporary slopes should be protected from erosion by installing a surface water diversion ditch or berm at the top of the slope and by covering the cut face with well-anchored plastic sheeting. In addition, the contractor should monitor the stability of the temporary cut slopes and adjust the construction schedule and slope inclination accordingly.

Exposure of personnel beneath temporary cut slopes should be kept to a minimum. Construction should proceed as rapidly as feasible, to limit the time temporary excavations are open. In addition, heavy construction equipment, building materials, excavated soil, and vehicular traffic should not be allowed within one-half of the slope height from the crest of any excavation.

5.2.5 Structural Fill Material and Compaction

For the purpose of this report, backfill placed below or against any structures, pavements, or sidewalks, is considered structural fill. In our opinion, the existing surficial fill materials have a high proportion of silt and organics, and should not be re-used as structural fills. Therefore, for this project, we recommend imported granular materials for all structural fill.

Imported structural fill should consist of Gravel Borrow, or Crushed Surfacing Base Course (CSBC), as specified in Sections 9-03.9(14) and 9-03.9(3) of the 2006 WSDOT

Standard Specifications, respectively. If fill is to be placed during wet weather or in wet conditions, then the percentage of fines (material passing the U.S. No. 200 sieve) should be restricted to 5 percent by weight, based on the fraction of material passing a ¾-inch sieve.

As discussed in Section 5.1.2 of this report, a 6-inch (minimum) thickness pad of Crushed Surfacing Base Course (CSBC) is recommended below all slabs on grade. Gravel borrow may be substituted for CSBC below the slabs-on-grade using a replacement ratio of 1.5, i.e., 6 inches of CSBC may be replaced with at least 9 inches of Gravel Borrow.

Structural fill should be placed in loose horizontal lifts and compacted to at least 95 percent of the maximum dry density, as determined using test method ASTM D 1557 (Modified Proctor). At the time of placement, the moisture content of the structural fill soils should be at or near optimum.

The procedure to achieve the specified minimum relative compaction depends on the size and type of compaction equipment, the number of passes, thickness of the layer being compacted, and soil moisture-density properties. We recommend the structural fill material and compaction be evaluated by an HWA representative. A sufficient number of in-place density tests should be performed as the fill is being placed to verify that the required compaction is being achieved uniformly throughout.

5.2.6 Wet Weather Earthwork

Earthwork is typically most economical when performed under dry weather conditions. If earthwork is to be performed or soil is to be placed in wet weather or under wet conditions, when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be accomplished in small sections to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of suitable thicknesses of clean structural fill.

- Material used as wet weather structural fill should consist of clean granular soil, containing less than 5 percent fines, based on the proportion passing a ¾-inch sieve. The fines should be non-plastic.

- The ground surface within the construction area should be graded to promote rapid runoff of precipitation, and to prevent surface water from ponding;

- No soil should be left uncompacted so it can absorb water. The ground surface within the construction area should be sealed by a smooth drum vibratory roller. Soils which become too wet for compaction should be removed and replaced with clean granular materials;

- Excavation and placement of fill should be observed by an HWA representative to verify that all unsuitable materials are removed and suitable compaction and site drainage is achieved; and

- Bales of straw and/or geotextile silt fences should be strategically located to control erosion.

5.2.7 Building and Site Drainage

We recommend a perimeter drainage system consist of a 4-inch diameter, perforated or slotted, rigid pipe, placed at or below footing subgrade elevation. The perimeter drain should be bedded and backfilled with (i.e. surrounded by) pea-gravel or washed drain rock. The perimeter drain should be sloped to discharge away from the building. The base course and/or capillary break layers for slabs-on-grade should have direct drainage access to the perimeter drainage system to ensure that build-up of water cannot occur within these layers.

Grades outside the building should be sloped such that surface water drains away. Roof drains should not discharge water immediately adjacent to footings. If roof drain spouts discharge water onto splash blocks, the splash blocks should be situated such that discharge occurs at least 3 feet away from the building line. Alternatively, roof drains could be tightlined to the local storm drain system or other appropriate outlet. Roof drains should not be interconnected with the perimeter footing drain system.

5.2.8 Underground Utilities

We understand that the proposed structures will include the installation and/or relocation of underground utilities. General recommendations relative to pipe bedding and utility trench backfill are presented as follows:

- Pipe bedding, material, placement, compaction, and shaping should be in accordance with the project specifications and the pipe manufacturer's recommendations. At a minimum, the pipe bedding should meet the gradation requirements for Gravel Backfill for Pipe Zone Bedding, Section 9-03.12(3) of the 2006 WSDOT *Standard Specifications for Road, Bridge and Municipal Construction.*

- Bedding materials should be placed on relatively undisturbed native soils, or compacted fill soils. If the native subgrade soils are disturbed, the disturbed material should be removed and replaced with compacted bedding material.

- In areas where the trench bottom encounters very soft or organic-rich subgrade soils, it may be necessary to over-excavate the unsuitable material and backfill with pipe bedding material. In wet conditions, we recommend using 5/8-inch minus crushed rock, meeting the gradation requirements for Crushed Surfacing Top Course, described in Section 9-03.9(3) of the 2006 WSDOT *Standard Specifications.*

- Bedding should provide a smooth, uniform, cradle for the pipe. We recommend that a minimum 4-inch thickness of bedding material beneath the pipe be provided. Larger thicknesses may be necessary to prevent loosening and softening of the natural soils during pipe placement.

- Prior to the installation of the pipe, the pipe bedding should be shaped to fit the lower portion of the pipe exterior with reasonable closeness to provide continuous support along the pipe.

- Backfill around the pipe should be placed in layers and tamped around the pipe to obtain complete contact. Pipe bedding material should extend at least 12 inches over the crown of the pipe, for the full width of the trench. In areas where a trench box is used, bedding should be placed before the trench box is advanced.

Soils excavated from trenches may be reused for backfill during dry weather conditions, provided that all organic soils and debris and other deleterious materials are separated during excavation and stockpiling. Alternatively, and during wet weather conditions, we recommend that trench backfill consist of Bank Run Gravel for Trench Backfill, as described in Section 9-03.19 of the 2006 WSDOT *Standard Specifications*. During placement of the initial lifts, the trench backfill material should not be bulldozed into the trench or dropped directly on the pipe. Furthermore, heavy vibratory equipment should not be permitted to operate directly over the pipe until a minimum of 2 feet of backfill has been placed. Trench backfill deeper than 2 feet below finished grade should be compacted to at least 90 percent of its maximum dry density (MDD), and the upper 2 feet should be compacted to at least 95 percent of its MDD as determined by test method ASTM D-1557. If utilities are placed beneath the building footprint and pavement areas, the full-depth of the trench backfill should be compacted to 95 percent of MDD.

6.0 REFERENCES

Minard, *Geologic Map of the Snohomish Quadrangle, Snohomish County, Washington.* United Stated Geological Survey Map MF-1745, 1985.

URS Corporation, *Targeted Brownfields Assessment Phase I Report, Snohomish Trail Corridor*, August 2003.

URS Corporation, *Targeted Brownfields Assessment Report, Snohomish Trail Corridor*, October 2004.

Washington State Department of Ecology, *Natural Background Soil Metals Concentrations in Washington State*, Toxics Cleanup Program, Publication No. 94-115, Charles San Juan, October 1994.

Washington State Department of Transportation (WSDOT), 2006, *Standard Specifications for Road, Bridge and Municipal Construction, M 41-10.*

7.0 LIMITATIONS

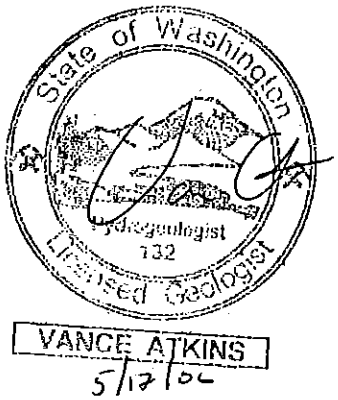
The conclusions expressed by HWA are based solely on material referenced in this report. Observations were made under the conditions stated. Within the limitations of scope, schedule and budget, HWA attempted to execute these services in accordance with generally accepted professional principles and practices in the area at the time the report was prepared. No warranty, expressed or implied, is made. Experience has shown that subsurface soil and ground water conditions can vary significantly over small distances. It is always possible that contamination may exist in areas that were not sampled. HWA's findings and conclusions must not be considered as scientific or engineering certainties, but rather as our professional opinion concerning the significance of the limited data gathered and interpreted during the course of the assessment.

This study and report have been prepared on behalf of City of Snohomish, for the specific application to the subject property. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

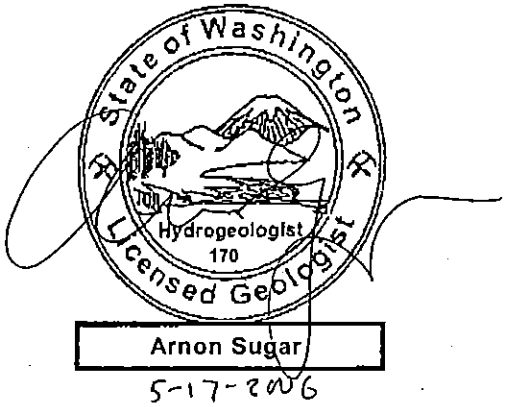
We appreciate the opportunity to provide professional services on this project. Please feel free to call us if you have any questions or need more information.

Sincerely,

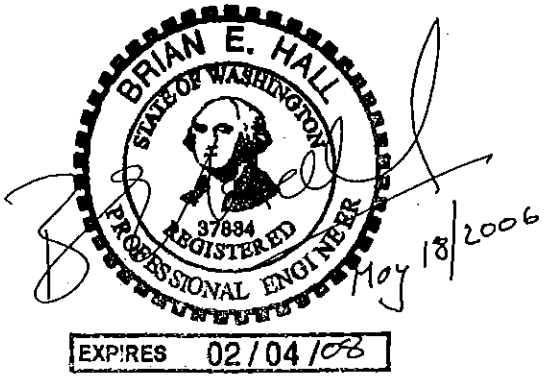
HWA GEOSCIENCES INC.



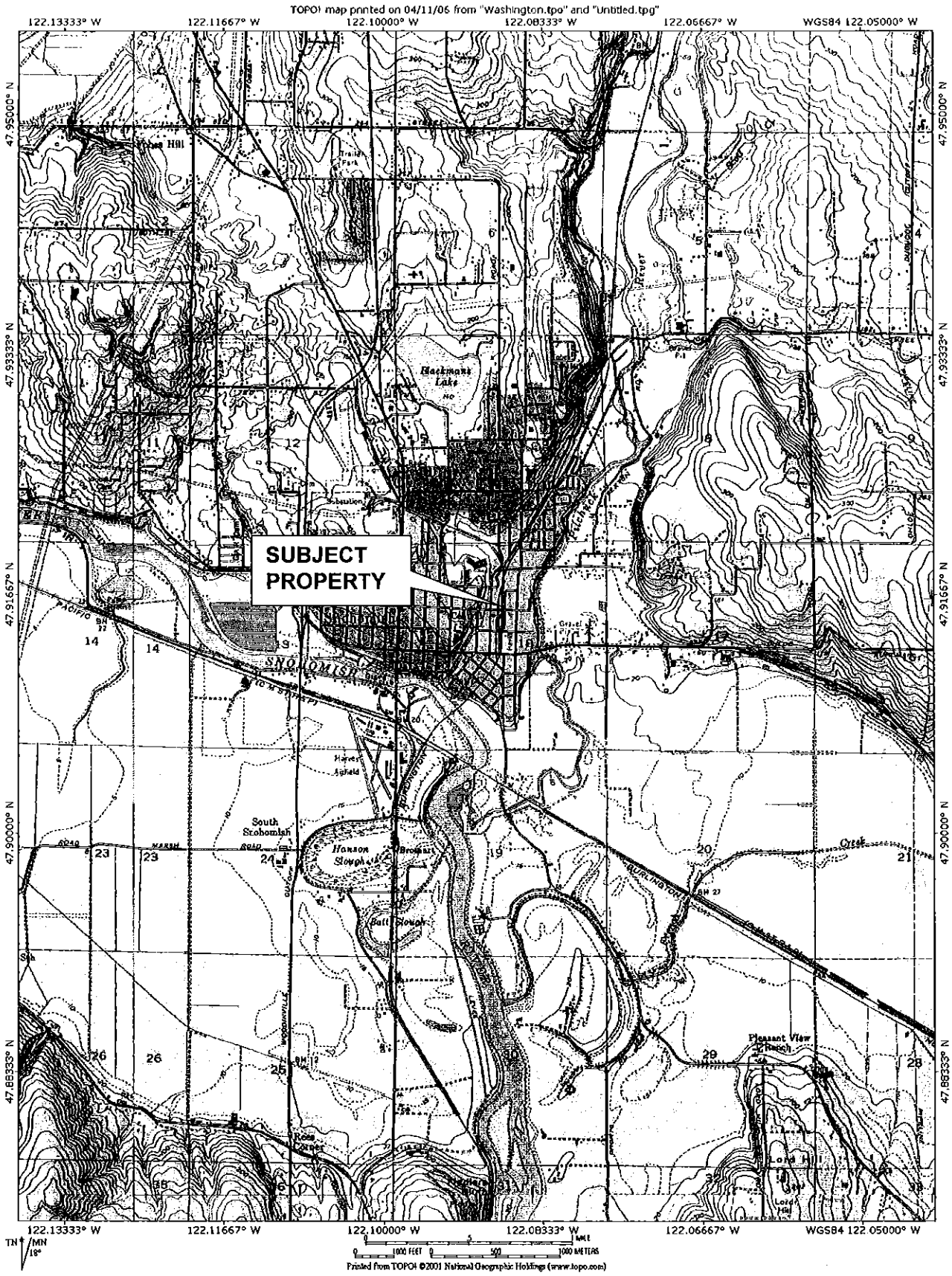
Vance Atkins, LG, LHG
Senior Hydrogeologist



Arnie Sugar, LG, LHG
Vice President



Brian E. Hall, P.E.
Senior Geotechnical Engineer



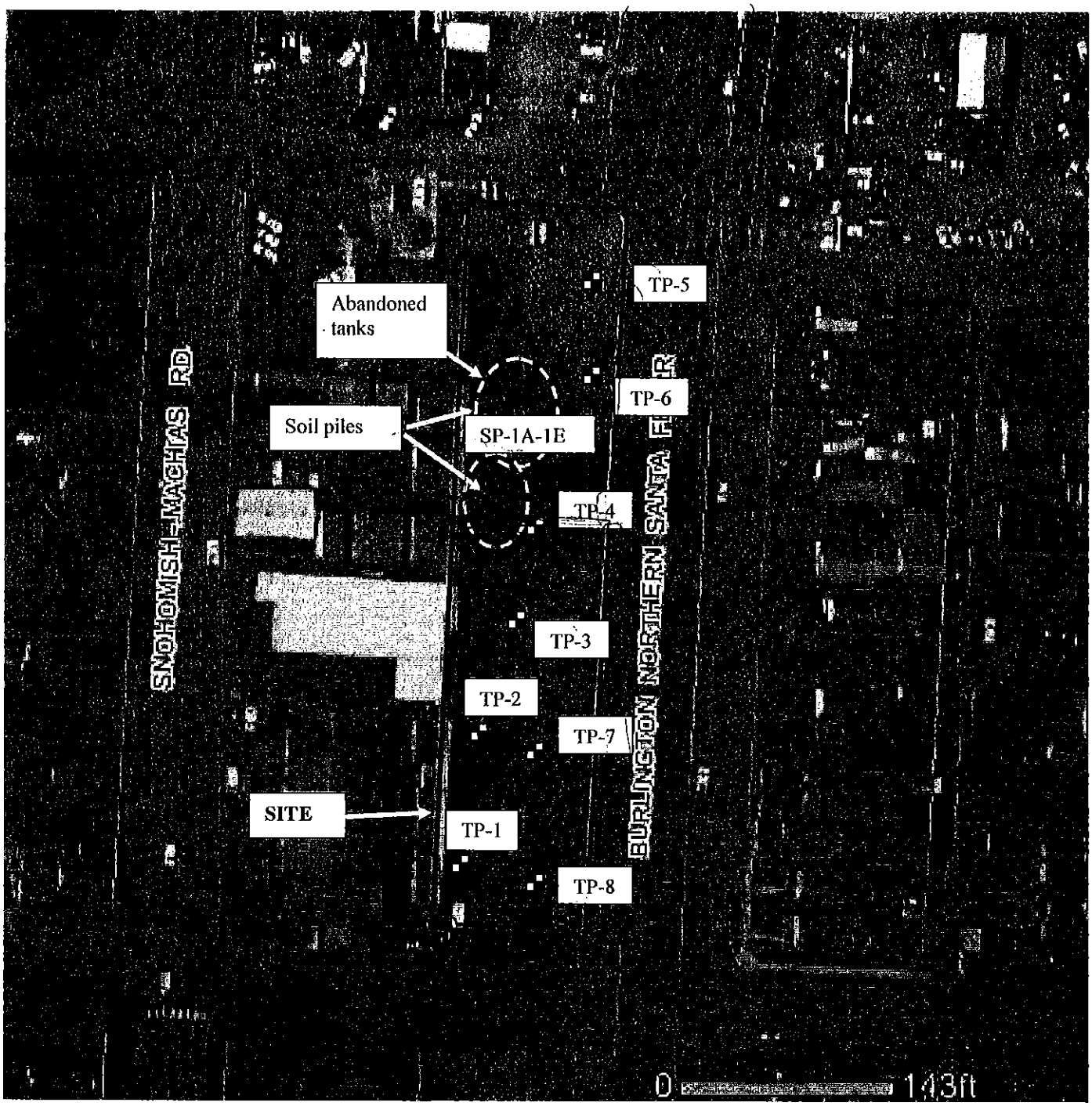
HWA GEOSCIENCES INC.

SITE LOCATION MAP

4TH STREET & MAPLE AVENUE
SNOHOMISH, WASHINGTON

FIGURE NO.
1

PROJECT NO.
2006-032



NORTH

Image from Snohomish County Online Property Information

Test pit location

Boring GP7-1 location (URS, 2004)

HWA GEOSCIENCES INC.

SITE EXPLORATION MAP

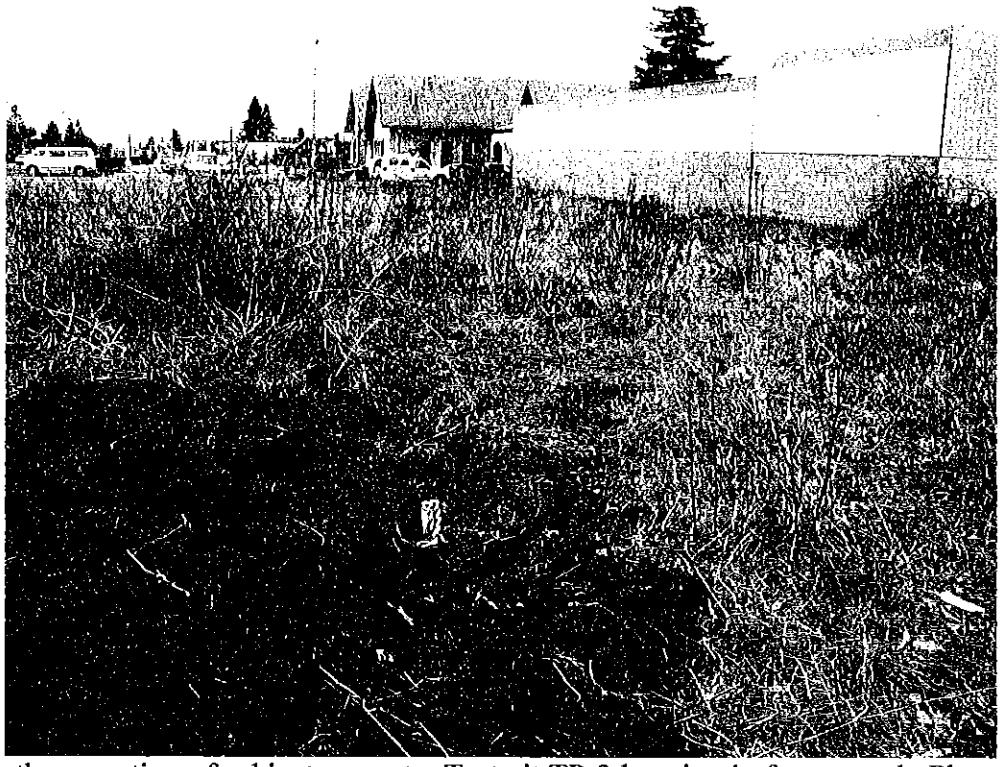
4TH STREET & MAPLE AVENUE
SNOHOMISH, WASHINGTON

FIGURE NO. **2**

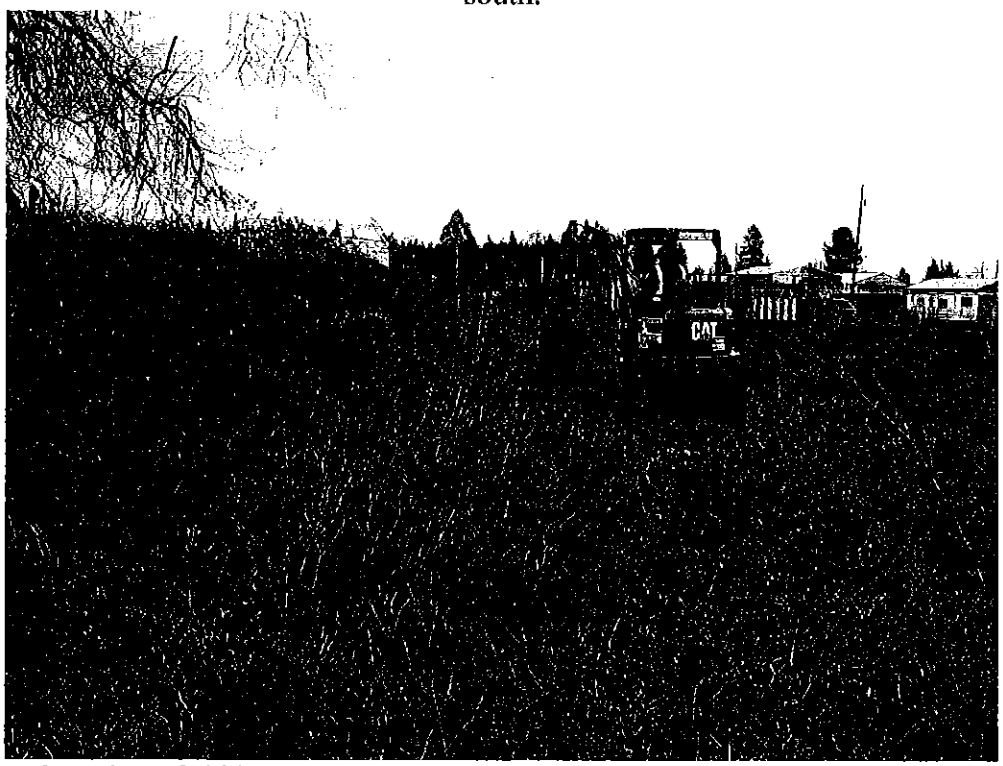
PROJECT NO. 2001-005-950

APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

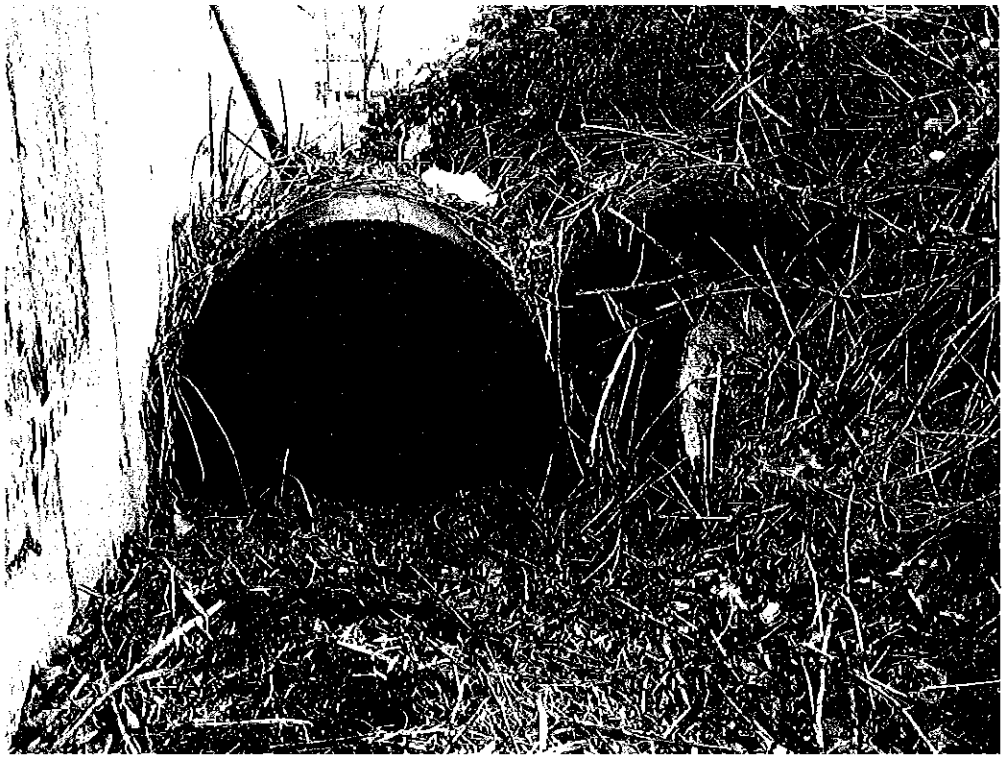


Southern portion of subject property, Test pit TP-3 location in foreground. Photo to south.



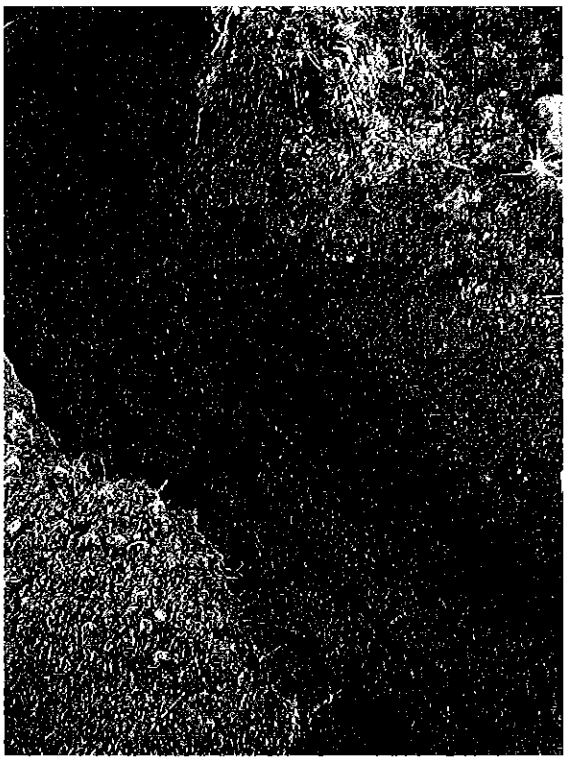
Central portion of subject property. Suspected petroleum-containing stockpile to left, abandoned rails to right. Photo to north.

Suspected petroleum-containing soil stockpile. Photo to south.

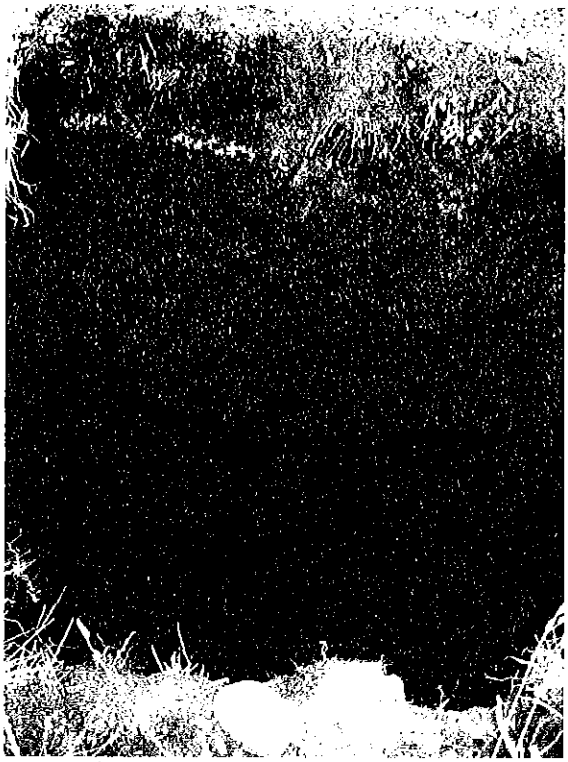


Abandoned steel tanks observed along west property boundary. Photo to north.

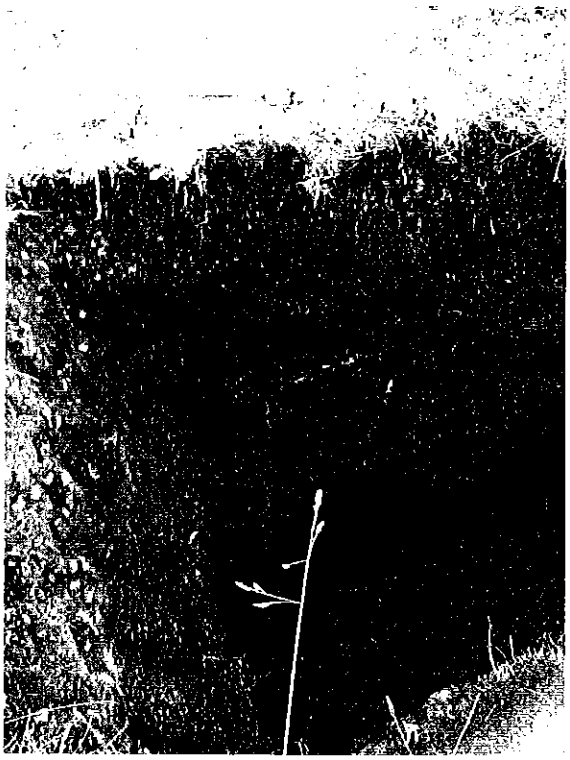
Stockpile SP-1C sample location soil conditions.



Stockpile SP-1E sample location soil conditions.

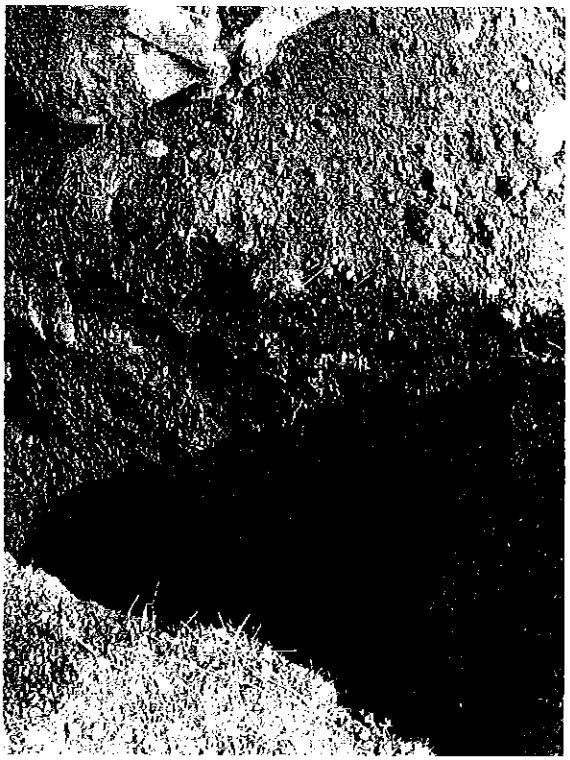


Test pit TP-1 – east sidewall, TD = 8 feet.



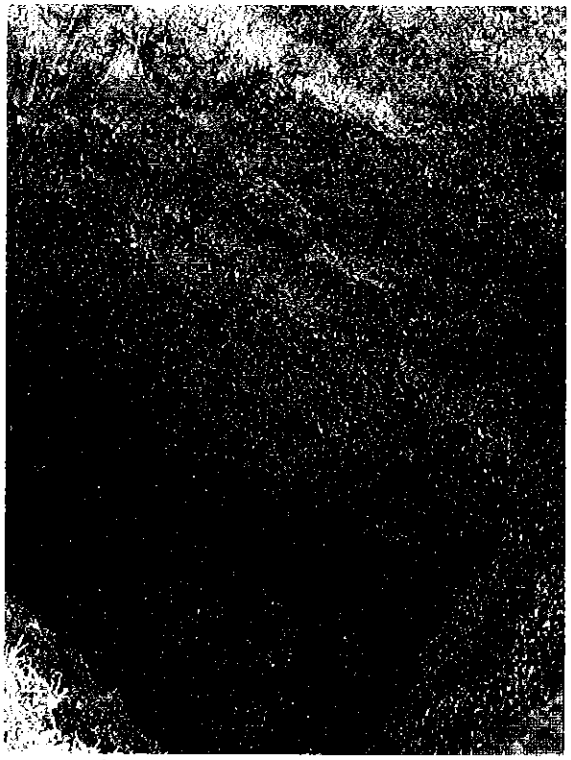
Test pit TP-4 – east sidewall, TD = 8 feet.

Test pit TP-5 – north sidewall, TD = 7 feet.



Test pit TP-6 – east sidewall, TD = 6 feet.

Test pit TP-7 – east sidewall, TD = 8 feet



Test pit TP-8 – east sidewall, TD = 8 feet

APPENDIX B

HISTORIC SITE PLANS

Dec. 1905
SNOHOMISH
WASH.

6

504

505

PINE

503

502

4TH

3D

RAILROAD

NORTHERN PACIFIC RY. MAIN TRACK

PLATFORM

N.P.R.R. DEPOT

RAILROAD RESERVATION

10

309

FRANK FRIESE'S FEED MILL

308

LAKE

23

307

SPRING

5

SCALE OF FEET.

Nov. 1908
SNOHOMISH
WASH.

8

504

505

PINE

503

502

RAILROAD

RAILROAD RESERVATION

N.P.R.R. DEPOT

309

SNOHOMISH FEED MILL

308

LAKE

307

23

CREEK

BRIDGE

SPRING

Scale of Feet.

12

1954

SNOHOMISH, WASH
NOV. 1908

8

WASH

GREEN HO.

504

505

PINE

503

502

12

LINCOLN
(RAILROAD)

MAIN TRACK

N.P.R.R. DEPOT

RAILROAD RESERVATION

309

SNOHOMISH FEED MILL

308

4TH

3RD

MAPLE
(LAKE)

23

307

Scale of Feet.

CEDAR

APPENDIX C

TEST PIT LOGS AND PARTICLE-SIZE ANALYSES

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Approximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
	More than 50% of Coarse Fraction Retained on No. 4 Sieve		GP	Poorly-graded GRAVEL
		Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
More than 50% Retained on No. 200 Sieve Size			SP	Poorly-graded SAND
	50% or More of Coarse Fraction Passing No. 4 Sieve	Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	PEAT

TEST SYMBOLS

%F	Percent Fines	
AL	Atterberg Limits:	PL = Plastic Limit LL = Liquid Limit
CBR	California Bearing Ratio	
CN	Consolidation	
DD	Dry Density (pcf)	
DS	Direct Shear	
GS	Grain Size Distribution	
K	Permeability	
MD	Moisture/Density Relationship (Proctor)	
MR	Resilient Modulus	
PID	Photoionization Device Reading	
PP	Pocket Penetrometer Approx. Compressive Strength (tsf)	
SG	Specific Gravity	
TC	Triaxial Compression	
TV	Torvane Approx. Shear Strength (tsf)	
UC	Unconfined Compression	

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- 3-1/4" OD Split Spoon with Brass Rings
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- Non-standard Penetration Test (3.0" OD split spoon)

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)
Components are arranged in order of increasing quantities.	

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation. Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

PROJECT NO.: 2006-032-22 FIGURE: C-1

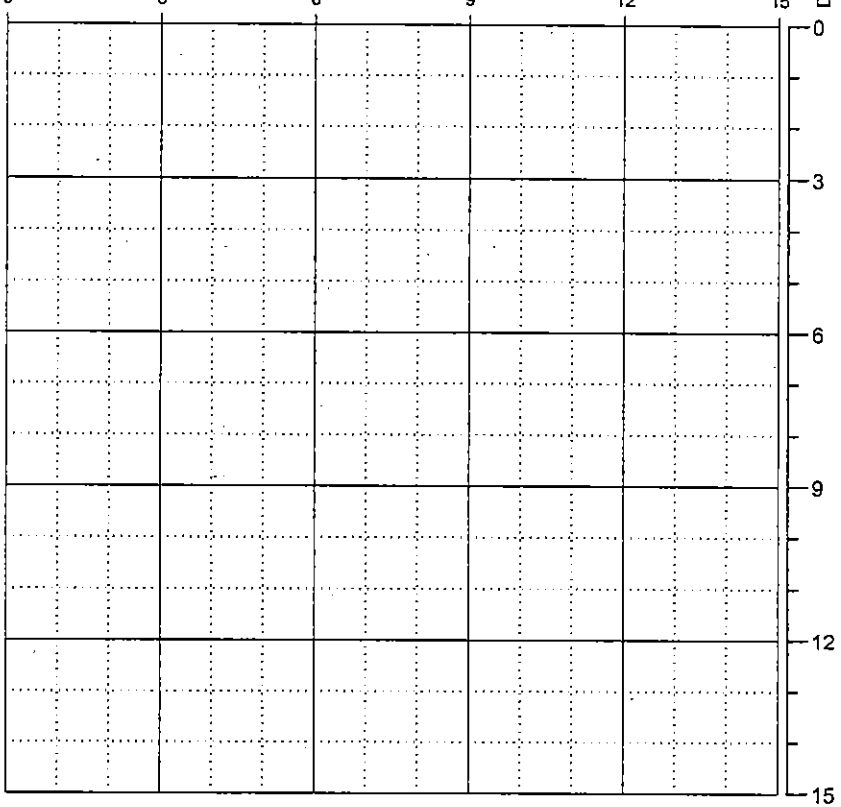
EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Dark gray silty medium SAND with trace gravel to 1" with root material (TOPSOIL/FILL). Loose to med. dense, moist. No odor or staining.					
		ML	Yellow-red grading brown SILT with sand and gravel to 2". Trace root material. Moist. Silt soft to medium stiff. Blocky.		TP-1-2	44		
3		SP	Grading brown coarse SAND with gravel with cobbles to 3" (ALLUVIUM). Trace oxidation. Moist, medium dense.					
6					TP-1-6	5		
9								
12								
15								

Test Pit Terminated at 8 feet
No groundwater encountered during excavation.
Caving/sloughing of test pit sidewalls observed below 5 feet bgs during excavation.

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP1

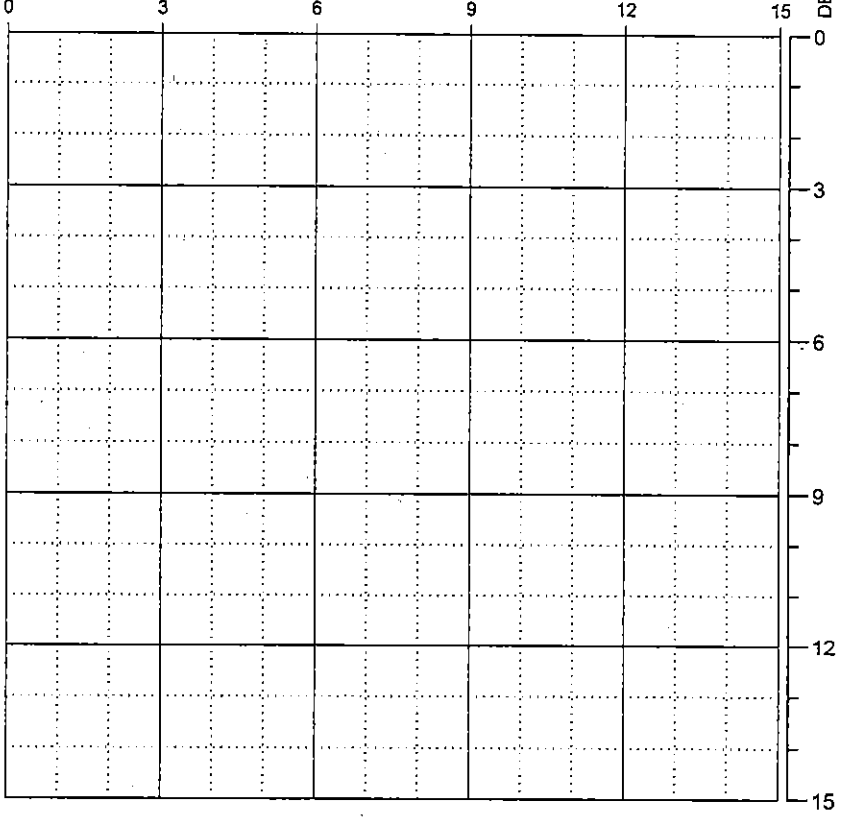
PROJECT NO.: 2006-032-22 FIGURE: C-2

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Dark gray silty SAND with gravel and root material (TOPSOIL/FILL). Loose to medium dense. No apparent odor or staining.					
3		SP SM	Yellowish-red silty sand and gravel grading brown coarse SAND with gravel with occasional cobbles to 4" (ALLUVIUM). Occasional silty layers. Silty layer cohesive/blocky, low plasticity. Moist.					
6					TP-2-6	5		
9			Test Pit Terminated at 8 feet No groundwater encountered during excavation. Caving/sloughing of test pit sidewalls observed below 7 feet bgs during excavation.					
12								
15								

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP2

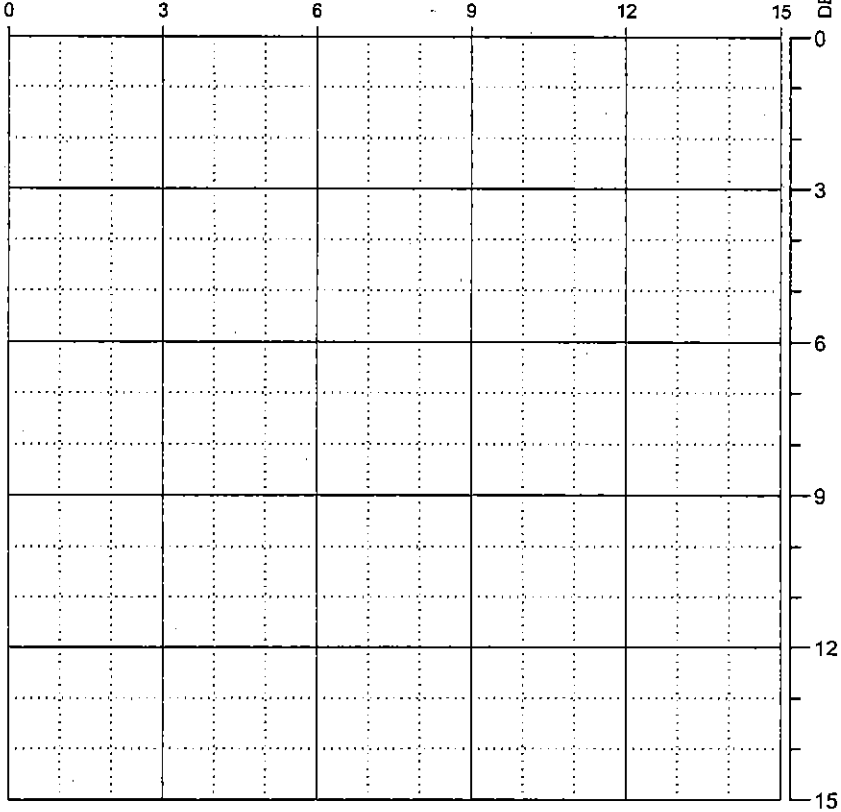
PROJECT NO.: 2006-032-22 FIGURE: C-3

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70' ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE / SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Dark gray silty SAND with brownish-yellow layer (TOPSOIL/FILL). Root material, occasional debris (burned?). Moist. No apparent odor or staining.	TP-3-1.5			
			Brick/debris layer at 2 feet bgs.				
3		ML	Yellowish red SILT with gravel. Occasional root material. Moist, low plasticity, soft to medium stiff.	TP-3-2.5	31		
		SP SM	Grading brown coarse SAND with gravel (ALLUVIUM) with oxidation (decreasing with depth). Occasional silty coating on gravel. Moist. Medium dense.				
6				TP-3-6	4		
9			Test Pit Terminated at 9 feet No groundwater encountered during excavation. Caving/sloughing of test pit sidewalls observed below 6 feet bgs during excavation.				
12							
15							

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP3

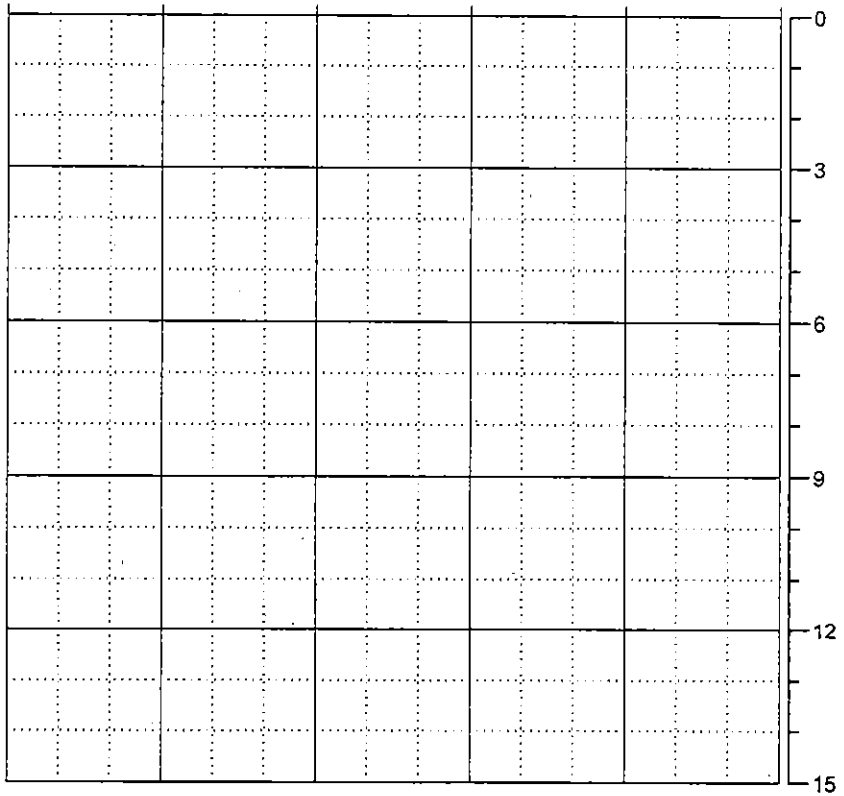
PROJECT NO.: 2006-032-22 FIGURE: C-4

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Gray to dark gray silty SAND and GRAVEL with burned material below 0.75 feet bgs (TOPSOIL/FILL). Medium dense, moist. No apparent odor or staining.					
		ML	Yellowish-red SILT with gravel, tree roots, and woody material. Soft to medium stiff, moist, blocky.		TP-4-1.5			
3		SP	Grading brown to brownish-yellow SAND with gravel (ALLUVIUM). Coarse, with gravel to 2", occasional cobble to 4", occasional silty lens. Slight oxidation and root material above 5 feet bgs. Moist, medium dense.					
6					TP-4-6	5		
9			Test Pit Terminated at 8 feet No groundwater encountered during excavation. Caving/sloughing of test pit sidewalls observed below 6 feet bgs during excavation.					
12								
15								

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP4

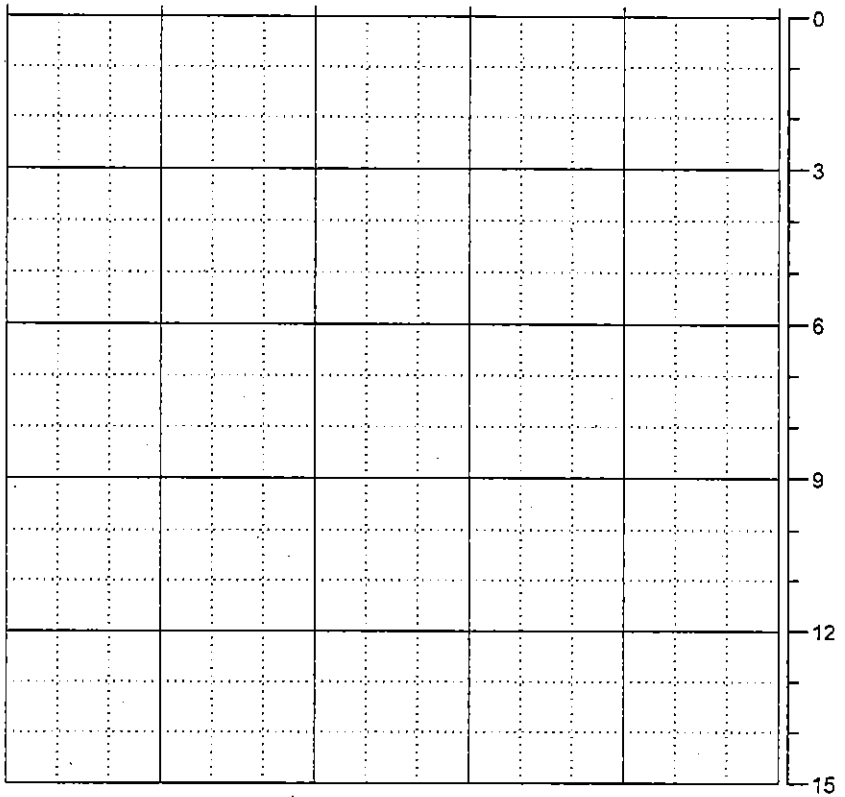
PROJECT NO.: 2006-032-22 FIGURE: C-5

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Dark gray to dark brown silty SAND with gravel and debris (burned material/brick) (FILL). Red-brown silty layer at 2.5 feet. Cinder, burned material below 2.5 feet. Medium dense, moist. No apparent odor or staining.					
3					TP-5-3	27		
6		ML	Light brown silt with clay and gravel. Mottled, low to medium plasticity, stiff, moist. Difficult to excavate below 6 feet bgs, grading gravelly (including cobbles to 6").		TP-5-6	31		
9			Test Pit Terminated at 7 feet No groundwater encountered during excavation. No caving/sloughing of test pit sidewalls observed during excavation.					
12								
15								

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP5

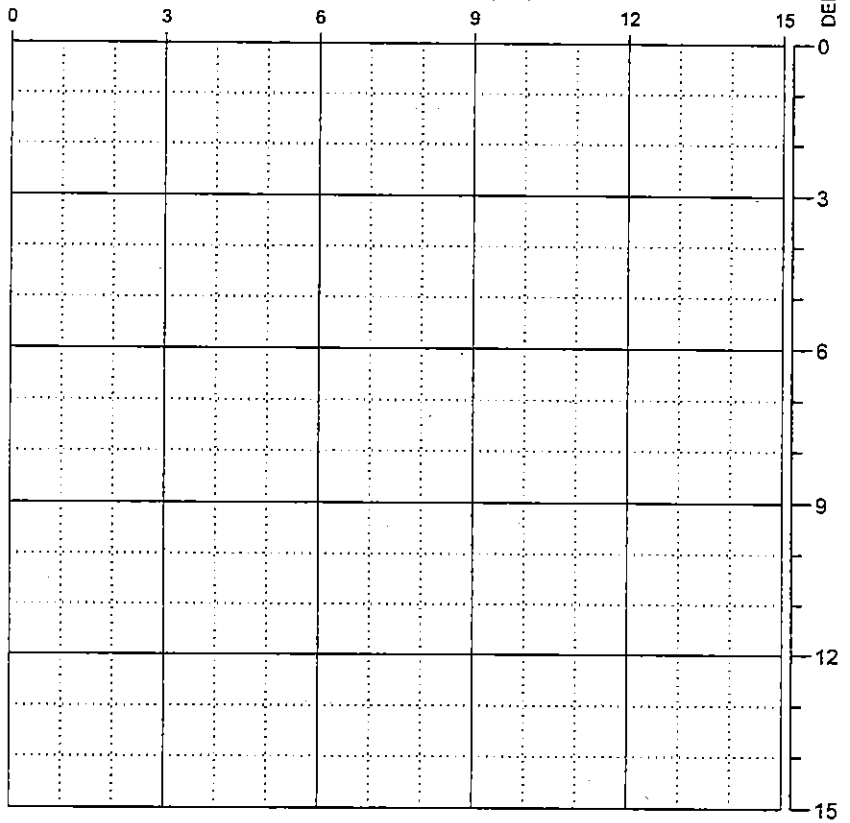
PROJECT NO.: 2006-032-22 FIGURE: C-6

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Dark gray to dark brown silty SAND with gravel and debris/burned material (FILL). Some layers of silty/gravelly fill. Loose to medium dense, moist. No apparent odor or staining.					
3		ML	Yellowish-red grading light brown SILT with gravel, some clay. Trace oxidation and mottling. Soft to medium stiff, moist, blocky.					
6		SP	Grading brown coarse SAND with gravel (ALLUVIUM). Occasional cobbles to 4". Moist, medium dense.		TP-6-6	7		
9			Test Pit Terminated at 6 feet No groundwater encountered during excavation. Caving/sloughing of test pit sidewalls observed at 6 feet bgsduring excavation.					
12								
15								

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP6

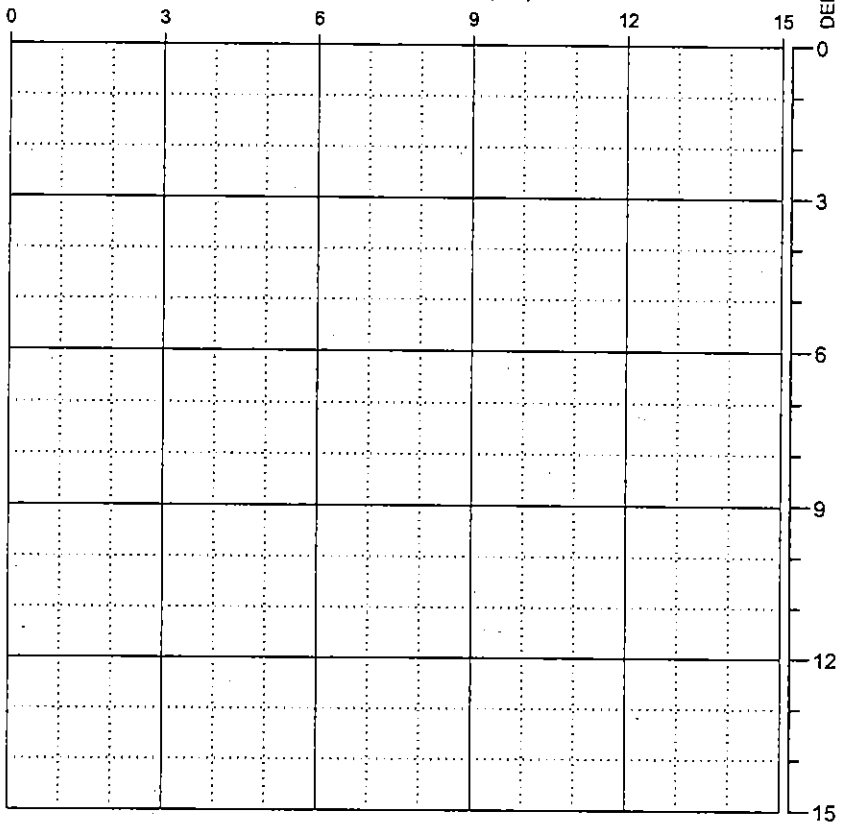
PROJECT NO.: 2006-032-22 FIGURE: C-7

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		SM	Dark gray silty SAND with root material and trace debris (TOPSOIL/FILL). Dry to moist, loose to medium dense. No apparent odor orstaining.					
		ML	Red-brown to brownish-yellow SILTwith gravel and trace root material. Moist, soft to medium dense, blocky.					
3		SP SM	Grading brown coarse SAND with silt and gravel, occasional cobbles to 4" (ALLUVIUM). Trace silty coating on gravels. Trace oxidation. Most, medium dense.		TP-7-3	33		
6					TP-7-6	6		
9			Test pit terminated at 8 feet. No groundwater encountered during excavation. Caving/sloughing of test pit sidewalls observed below 7 feet bgs during excavation.					
12								
15								

SKETCH OF SIDE OF PIT



HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP7

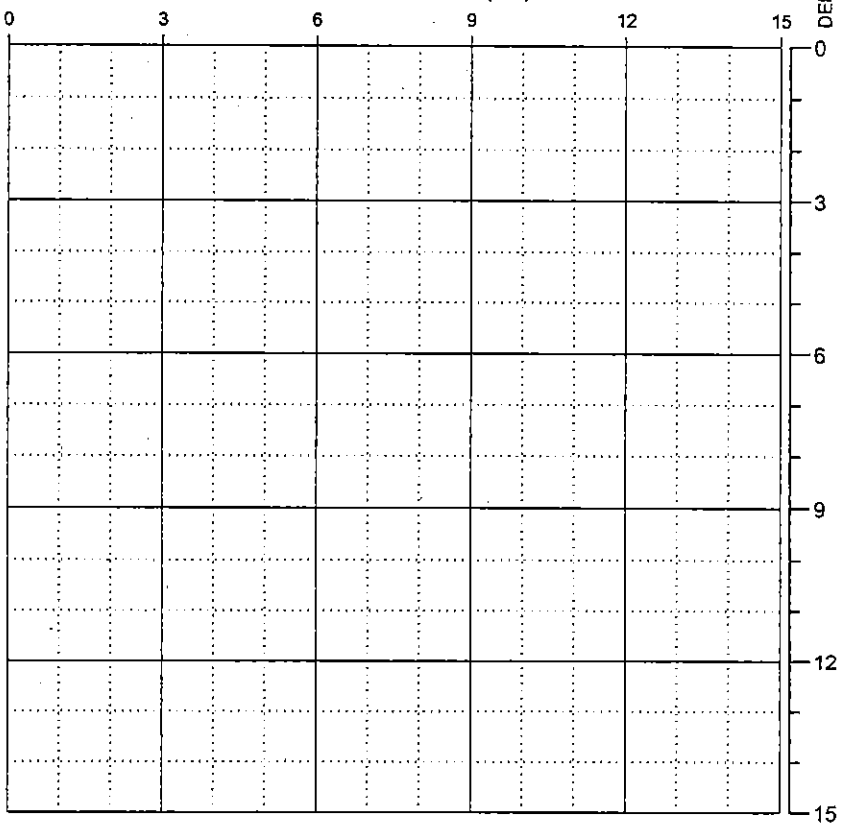
PROJECT NO.: 2006-032-22 FIGURE C-8

EXCAVATION COMPANY: Clearcreek Contractors
EXCAVATING EQUIPMENT: Caterpillar 303 excavator
SURFACE ELEVATION: 70 ± Feet

LOCATION: See Figure 2
DATE COMPLETED: 3/21/06
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS.	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	MOISTURE CONTENT (%)	OTHER TESTS	GROUNDWATER
0		GP	Angular GRAVEL fill to 3/4". Parking surface. Dry.					
		GM	Rounded silty GRAVEL with sand (FILL). Trace debris, burned material. Medium dense, dry. No apparent odor or staining.					
3		ML	Yellowish-red grading brownish-yellow SILT with gravel. Some oxidation. Moist, low to medium plastic.					
6		SP	Grading brownish-yellow to brown coarse SAND with gravel (ALLUVIUM). Occasional gravel and cobbles to 4". Trace oxidation, trace silty coating on gravels. Moist, medium dense.		TP-8-6	5		
9			Test pit terminated at 8 feet. No groundwater encountered during excavation. Caving/sloughing of test pit sidewalls observed below 7 feet bgs during excavation.					
12								
15								

SKETCH OF SIDE OF PIT

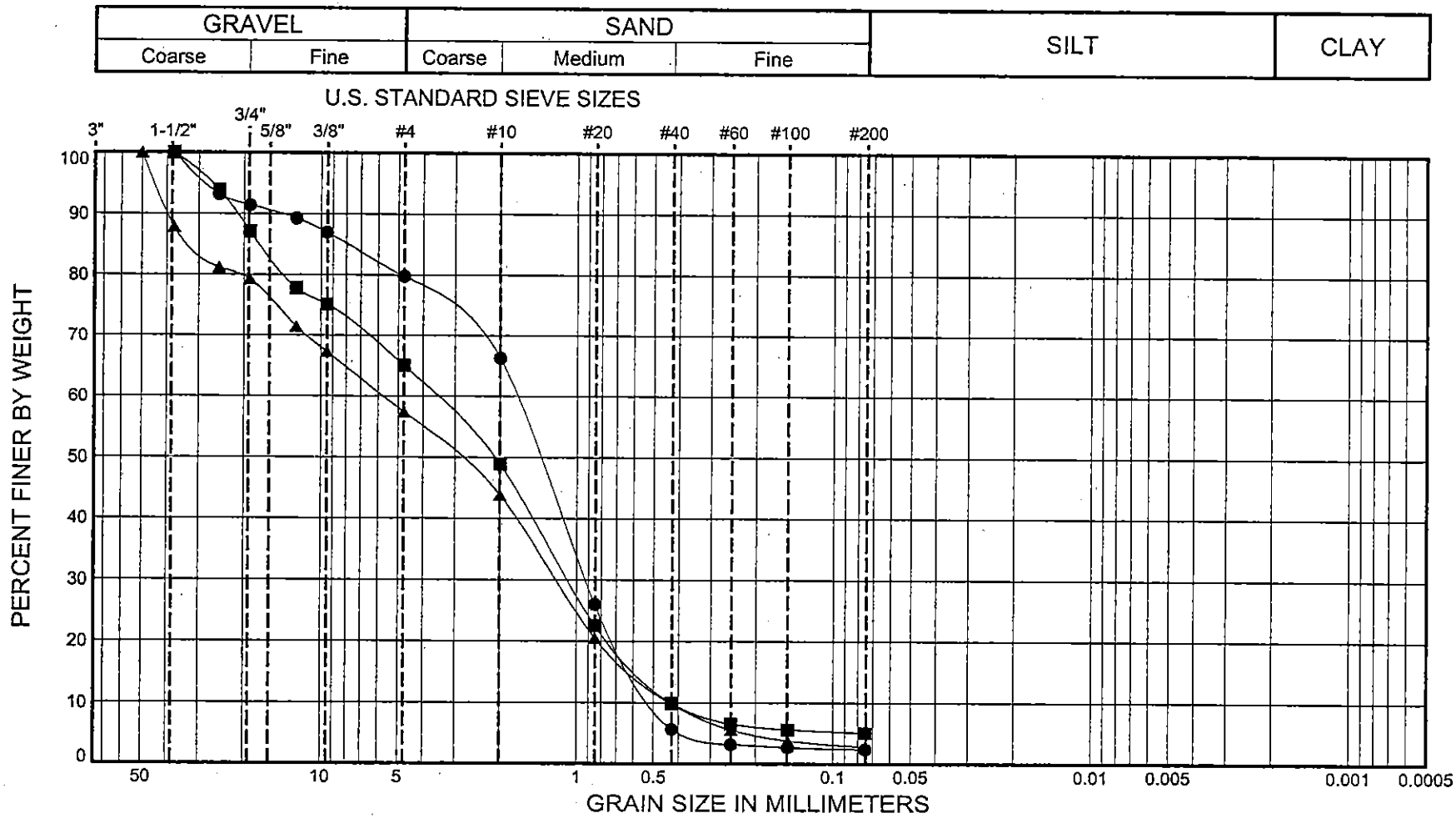


HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

LOG OF TEST PIT
TP8

PROJECT NO: 2006-032-22 FIGURE: C-9



SYMBOL	SAMPLE		DEPTH (ft)	CLASSIFICATION OF SOIL- ASTM D2487 Group Symbol and Name	% MC	LL	PL	PI	Gravel %	Sand %	Fines %
●	TP4	TP-4-6		(SP) Brown, poorly graded SAND with gravel	5				20.2	77.5	2.3
■	TP7	TP-7-6		(SP-SM) Brown, poorly graded SAND with silt and gravel	6				35.0	60.0	5.0
▲	TP8	TP-8-6		(SP) Brown, poorly graded SAND with gravel	5				42.6	54.7	2.7

HWA GEOSCIENCES INC.

Maple Ave & 4th Street
Snohomish, Washington

PARTICLE-SIZE ANALYSIS
OF SOILS
METHOD ASTM D422

PROJECT NO.: 2006-032-22 FIGURE: C-1

APPENDIX D

ANALYTICAL LABORATORY REPORTS

CCI
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LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: HWA GEOSCIENCES
19730 64TH AVE. W. SUITE 200
LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 8:35 TP-1-6
CCIL SAMPLE #: -01

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	ND(<25)	MG/KG	3/22/2006	DLC
TPH-Oil Range	NWTPH-DX	ND(<50)	MG/KG	3/22/2006	DLC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

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19730 64TH AVE. W. SUITE 200
LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 9:15 TP-2-6
CCIL SAMPLE #: -02

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	ND(<25)	MG/KG	3/22/2006	DLC
TPH-Oil Range	NWTPH-DX	ND(<50)	MG/KG	3/22/2006	DLC

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LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 9:50 TP-3-1.5
CCIL SAMPLE #: -03

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	ND(<20)	MG/KG	3/23/2006	DLC
HCID-Diesel Range	NWTPH-HCID	ND(<50)	MG/KG	3/23/2006	DLC
HCID-Oil Range	NWTPH-HCID	ND(<100)	MG/KG	3/23/2006	DLC
Arsenic	EPA-6010	8.0	MG/KG	3/23/2006	RAB
Cadmium	EPA-6010	0.54	MG/KG	3/23/2006	RAB
Chromium	EPA-6010	9.0	MG/KG	3/23/2006	RAB
Lead	EPA-6010	340	MG/KG	3/23/2006	RAB
Mercury	EPA-7471	0.06	MG/KG	3/23/2006	RAB

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CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 9:55 TP-3-6
CCIL SAMPLE #: -04

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
Lead	EPA-6010	2.6	MG/KG	4/10/2006	CEO

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 10:40 TP-4-1.5
CCIL SAMPLE #: -06

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	ND(<20)	MG/KG	3/23/2006	DLC
HCID-Diesel Range	NWTPH-HCID	ND(<50)	MG/KG	3/23/2006	DLC
HCID-Oil Range	NWTPH-HCID	ND(<100)	MG/KG	3/23/2006	DLC
Arsenic	EPA-6010	9.3	MG/KG	3/23/2006	RAB
Cadmium	EPA-6010	ND(<0.30)	MG/KG	3/23/2006	RAB
Chromium	EPA-6010	14	MG/KG	3/23/2006	RAB
Lead	EPA-6010	160	MG/KG	3/23/2006	RAB
Mercury	EPA-7471	0.06	MG/KG	3/23/2006	RAB

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LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 11:12 SP-1A
CCIL SAMPLE #: -07

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	ND(<3)	MG/KG	3/23/2006	GAP
Benzene	EPA-8021	ND(<0.03)	MG/KG	3/23/2006	GAP
Toluene	EPA-8021	ND(<0.05)	MG/KG	3/23/2006	GAP
Ethylbenzene	EPA-8021	ND(<0.05)	MG/KG	3/23/2006	GAP
Xylenes	EPA-8021	ND(<0.2)	MG/KG	3/23/2006	GAP
TPH-Diesel Range	NWTPH-DX	ND(<25)	MG/KG	3/22/2006	DLC
TPH-Oil Range	NWTPH-DX	140	MG/KG	3/22/2006	DLC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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19730 64TH AVE. W. SUITE 200
LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 11:13 SP-1B
CCIL SAMPLE #: -08

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	ND(<3)	MG/KG	3/23/2006	GAP
Benzene	EPA-8021	ND(<0.03)	MG/KG	3/23/2006	GAP
Toluene	EPA-8021	ND(<0.05)	MG/KG	3/23/2006	GAP
Ethylbenzene	EPA-8021	ND(<0.05)	MG/KG	3/23/2006	GAP
Xylenes	EPA-8021	ND(<0.2)	MG/KG	3/23/2006	GAP
TPH-Diesel Range	NWTPH-DX	ND(<25)	MG/KG	3/22/2006	DLC
TPH-Oil Range	NWTPH-DX	120	MG/KG	3/22/2006	DLC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:

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LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 11:14 SP-1C
CCIL SAMPLE #: -09

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	690	MG/KG	3/23/2006	GAP
Benzene	EPA-8021	ND(<0.3)	MG/KG	3/23/2006	GAP
Toluene	EPA-8021	1.0	MG/KG	3/23/2006	GAP
Ethylbenzene	EPA-8021	4.0	MG/KG	3/23/2006	GAP
Xylenes	EPA-8021	3	MG/KG	3/23/2006	GAP
TPH-Diesel Range	NWTPH-DX	180	MG/KG	3/22/2006	DLC
TPH-Oil Range	NWTPH-DX	220	MG/KG	3/22/2006	DLC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS HIGHLY WEATHERED GASOLINE AND DIESEL #1 OR SIMILAR PRODUCT, LIGHT OIL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

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19730 64TH AVE. W. SUITE 200
LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 11:15 SP-1D
CCIL SAMPLE #: -10

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	6	MG/KG	3/23/2006	GAP
Benzene	EPA-8021	ND(<0.03)	MG/KG	3/23/2006	GAP
Toluene	EPA-8021	ND(<0.05)	MG/KG	3/23/2006	GAP
Ethylbenzene	EPA-8021	ND(<0.05)	MG/KG	3/23/2006	GAP
Xylenes	EPA-8021	ND(<0.2)	MG/KG	3/23/2006	GAP
TPH-Diesel Range	NWTPH-DX	74	MG/KG	3/22/2006	DLC
TPH-Oil Range	NWTPH-DX	150	MG/KG	3/22/2006	DLC

NOTE: CHROMATOGRAM INDICATES SAMPLCONTAINS PRODUCTS WHICH ARE LIKELY HIGHLY WEATHERED GASOLINE, DIESEL FUEL, LIGHT OIL AND LUBE OIL

DIESEL RANGE RESULT IS BIASED HIGH DUE TO LUBE OIL RANGE OVERLAP

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:

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CERTIFICATE OF ANALYSIS

CLIENT: HWA GEOSCIENCES
19730 64TH AVE. W. SUITE 200
LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 11:20 SP-1E
CCIL SAMPLE #: -11

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TPH-Volatile Range	NWTPH-GX	610	MG/KG	3/23/2006	GAP
Benzene	EPA-8021	ND(<0.03)	MG/KG	3/22/2006	GAP
Toluene	EPA-8021	0.16	MG/KG	3/22/2006	GAP
Ethylbenzene	EPA-8021	1.1	MG/KG	3/22/2006	GAP
Xylenes	EPA-8021	1.7	MG/KG	3/22/2006	GAP
TPH-Diesel Range	NWTPH-DX	290	MG/KG	3/24/2006	DLC
TPH-Oil Range	NWTPH-DX	270	MG/KG	3/24/2006	DLC
PCB-1016	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL
PCB-1221	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL
PCB-1232	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL
PCB-1242	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL
PCB-1248	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL
PCB-1254	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL
PCB-1260	EPA-8082	ND(<0.1)	MG/KG	3/31/2006	RAL

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS HIGHLY WEATHERED GASOLINE AND DIESEL #1 OR SIMILAR PRODUCT AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES.

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:

8620 Holly Drive Suite 100 Everett, WA 98208 425 356-2600 FAX 425 356-2626 Seattle 206 292-9059

CCI
ANALYTICAL
LABORATORIES, INC

CERTIFICATE OF ANALYSIS

CLIENT: HWA GEOSCIENCES
19730 64TH AVE. W. SUITE 200
LYNNWOOD, WA 98036

DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 12:45 TP-5-3
CCIL SAMPLE #: -12

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	ND(<20)	MG/KG	3/23/2006	DLC
HCID-Diesel Range	NWTPH-HCID	ND(<50)	MG/KG	3/23/2006	DLC
HCID-Oil Range	NWTPH-HCID	ND(<100)	MG/KG	3/23/2006	DLC
Arsenic	EPA-6010	ND(<6)	MG/KG	3/23/2006	RAB
Cadmium	EPA-6010	ND(<0.34)	MG/KG	3/23/2006	RAB
Chromium	EPA-6010	7.5	MG/KG	3/23/2006	RAB
Lead	EPA-6010	700	MG/KG	3/23/2006	RAB
Mercury	EPA-7471	0.05	MG/KG	3/23/2006	RAB

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CLIENT SAMPLE ID: 3/21/2006 12:45 TP-5-3
CCIL SAMPLE #: -12

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
TCLP-Arsenic	EPA-1311/6010	ND(<0.04)	MG/L	4/10/2006	CEO
TCLP-Cadmium	EPA-1311/6010	0.78	MG/L	4/10/2006	CEO
TCLP-Chromium	EPA-1311/6010	ND(<0.007)	MG/L	4/10/2006	CEO
TCLP-Lead	EPA-1311/6010	0.17	MG/L	4/10/2006	CEO
TCLP-Mercury	EPA-1311/7470	0.0003	MG/L	4/11/2006	CEO

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CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 12:50 TP-5-6
CCIL SAMPLE #: -13

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
Lead	EPA-6010	15	MG/KG	4/10/2006	CEO

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19730 64TH AVE. W. SUITE 200
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DATE: 4/12/2006
CCIL JOB #: 0603132
DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH
CLIENT SAMPLE ID: 3/21/2006 13:30 TP-6-1.5
CCIL SAMPLE #: -15

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	ND(<20)	MG/KG	3/23/2006	DLC
HCID-Diesel Range	NWTPH-HCID	ND(<50)	MG/KG	3/23/2006	DLC
HCID-Oil Range	NWTPH-HCID	ND(<100)	MG/KG	3/23/2006	DLC
Arsenic	EPA-6010	6.8	MG/KG	3/23/2006	RAB
Cadmium	EPA-6010	ND(<0.27)	MG/KG	3/23/2006	RAB
Chromium	EPA-6010	11	MG/KG	3/23/2006	RAB
Lead	EPA-6010	160	MG/KG	3/23/2006	RAB
Mercury	EPA-7471	0.03	MG/KG	3/23/2006	RAB

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CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	METHOD	SUR ID	% RECV
0603132-01	NWTPH-DX	C25	104
0603132-02	NWTPH-DX	C25	107
0603132-03	NWTPH-HCID	BCB	107
0603132-03	NWTPH-HCID	C25	115
0603132-06	NWTPH-HCID	BCB	108
0603132-06	NWTPH-HCID	C25	107
0603132-07	NWTPH-GX	TFT	76
0603132-07	EPA-8021	TFT	85
0603132-07	NWTPH-DX	C25	109
0603132-08	NWTPH-GX	TFT	78
0603132-08	EPA-8021	TFT	87
0603132-08	NWTPH-DX	C25	98
0603132-09	NWTPH-GX	TFT	123
0603132-09	EPA-8021	TFT	135
0603132-09	NWTPH-DX	C25	116
0603132-10	NWTPH-GX	TFT	69
0603132-10	EPA-8021	TFT	80
0603132-10	NWTPH-DX	C25	111
0603132-11	NWTPH-GX	TFT	78
0603132-11	EPA-8021	TFT	133
0603132-11	NWTPH-DX	C25	112
0603132-11	EPA-8082	TCMX	65
0603132-11	EPA-8082	DBC	86
0603132-12	NWTPH-HCID	BCB	113
0603132-12	NWTPH-HCID	C25	112
0603132-15	NWTPH-HCID	BCB	129
0603132-15	NWTPH-HCID	C25	131

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WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH

QUALITY CONTROL RESULTS

BLANK RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	RESULT	UNITS
NWTPH-HCID	Soil	HS032306	0603132 -03,06,12,15	HCID-Gas Range	ND(<20)	MG/KG
NWTPH-HCID	Soil	HS032306	0603132 -03,06,12,15	HCID-Diesel Range	ND(<50)	MG/KG
NWTPH-HCID	Soil	HS032306	0603132 -03,06,12,15	HCID-Oil Range	ND(<100)	MG/KG
NWTPH-GX	Soil	GS060322	0603132 -07 to 11	TPH-Volatile Range	ND(<3)	MG/KG
EPA-8021	Soil	GS060322	0603132 -07 to 11	Benzene	ND(<0.03)	MG/KG
EPA-8021	Soil	GS060322	0603132 -07 to 11	Toluene	ND(<0.05)	MG/KG
EPA-8021	Soil	GS060322	0603132 -07 to 11	Ethylbenzene	ND(<0.05)	MG/KG
EPA-8021	Soil	GS060322	0603132 -07 to 11	Xylenes	ND(<0.2)	MG/KG
NWTPH-DX	Soil	DS032206	0603132 -01,02,07 to 11	TPH-Diesel Range	ND(<25)	MG/KG
NWTPH-DX	Soil	DS032206	0603132 -01,02,07 to 11	TPH-Oil Range	ND(<50)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1016	ND(<0.1)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1221	ND(<0.1)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1232	ND(<0.1)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1242	ND(<0.1)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1248	ND(<0.1)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1254	ND(<0.1)	MG/KG
EPA-8082	Soil	PS032806	0603132 -11	PCB-1260	ND(<0.1)	MG/KG
EPA-7471	Soil	HG-S-032306	0603132 -03,06,12,15	Mercury	ND(<0.02)	MG/KG
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Arsenic	ND(<6)	MG/KG
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Cadmium	ND(<0.10)	MG/KG
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Chromium	ND(<0.13)	MG/KG
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Lead	ND(<0.72)	MG/KG
EPA-6010	Soil	ICPMET-S-041006-2	0603132 -04,13	Lead	ND(<0.72)	MG/KG
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Arsenic	ND(<0.04)	MG/L
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Cadmium	ND(<0.005)	MG/L
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Chromium	ND(<0.007)	MG/L
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Lead	ND(<0.04)	MG/L
EPA-1311/7470	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Mercury	ND(<0.0002)	MG/L

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DATE RECEIVED: 3/21/2006
WDOE ACCREDITATION #: C142

CLIENT CONTACT: VANCE ATKINS

CLIENT PROJECT ID: 4TH MAPLE-SNOHOMISH

QUALITY CONTROL RESULTS

DUPLICATE RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	RESULT	DUP RESULT	RPD
NWTPH-HCID	Soil	HS032306	0603132 -03,06,12,15	HCID-Gas Range	<20 MG/KG	<20 MG/KG	
NWTPH-HCID	Soil	HS032306	0603132 -03,06,12,15	HCID-Diesel Range	<50 MG/KG	<50 MG/KG	
NWTPH-HCID	Soil	HS032306	0603132 -03,06,12,15	HCID-Oil Range	>100 MG/KG	>100 MG/KG	

SPIKE/SPIKE DUPLICATE RESULTS

METHOD	MATRIX	QC BATCH ID	ASSOCIATED SAMPLES	ANALYTE	SPIKE RECOVERY	SPIKE DUP RECOVERY	RPD
NWTPH-GX	Soil	GS060322	0603132 -07 to 11	TPH-Volatile Range	63 %	63 %	0
EPA-8021	Soil	GS060322	0603132 -07 to 11	Benzene	88 %	90 %	2
EPA-8021	Soil	GS060322	0603132 -07 to 11	Toluene	89 %	90 %	1
EPA-8021	Soil	GS060322	0603132 -07 to 11	Ethylbenzene	87 %	87 %	0
EPA-8021	Soil	GS060322	0603132 -07 to 11	Xylenes	90 %	90 %	0
NWTPH-DX	Soil	DS032206	0603132 -01,02,07 to 11	TPH-Diesel Range	88 %	88 %	0
EPA-8082	Soil	PS032806	0603132 -11	PCB-1016/1260	85 %	100 %	16
EPA-7471	Soil	HG-S-032306	0603132 -03,06,12,15	Mercury	100 %	100 %	0
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Arsenic	98 %	101 %	3
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Cadmium	97 %	99 %	2
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Chromium	97 %	99 %	2
EPA-6010	Soil	ICPMET-S-032306-1	0603132 -03,06,12,15	Lead	97 %	100 %	3
EPA-6010	Soil	ICPMET-S-041006-2	0603132 -04,13	Lead	100 %	99 %	1
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Arsenic	102 %	101 %	1
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Cadmium	104 %	104 %	0
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Chromium	102 %	101 %	1
EPA-1311/6010	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Lead	99 %	98 %	1
EPA-1311/7470	TCLP	ICPMET-W-041006-1	0603132 -12	TCLP-Mercury	115 %	115 %	0

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60313Z

HWA GEOSCIENCES INC.
19730 64th Ave. W., Suite 200, Lynnwood, WA 98036 (425)774-0106
~~4500 Kruse Way, Suite 300, Lake Oswego, OR 97035 (503)675-2424~~

Chain of Custody and Laboratory Analysis Request

DATE: 3/21/06
PAGE: 1 of 1

PROJECT NAME: 4TH & MAPLE - SUBSTATION #:
SITE CODE:
SAMPLERS NAME: ATKINS PHONE: 425-774-8106
SAMPLERS SIGNATURE:
HWA CONTACT: VANCE ATKINS PHONE:

HWA SAMPLE ID	DATE	TIME	MATRIX	LAB ID	# OF BOTTLE	Nutrients - NH3	Nutrients - TP	Nutrients - Ortho, Nitrate-Nitrite	Metals	PCB's	TCLP Metals	Total Lead	REMARKS
TP-1-6	3/21/06	835	Soil	1	2		X						Hold for Analysis
TP-2-6		915		2			X						
TP-3-1.5		950		3		X			X				Analysis Called 3:22:06 VIA VM
TP-3-6		955		4								+	
TP-4-6		1035		5									
TP-4-1.5		1040		6	2	X			X				
SP-1A		1112		7	1		X	X					Not recd 5035A Std TAT
SP-1B		1113		8	1		X	X					
SP-1C		1114		9	1		X	X					
SP-1D		1115		10	1		X	X					
SP-1E		1120		11	1		X	X		⊗			⊗ Added 3/30/06 per Vance Normal TAT RS
TP-5-3		1245		12	2	X			X		⊗		
TP-5-6		1250		13								+	+ Added 4/4/06 per Vance Normal TAT
TP-6-6		1320		14									
TP-6-1.5		1330		15		X			X				
TP-7-3		1400		16									
TP-8-2		1435		17									

PRINT NAME	SIGNATURE	COMPANY	DATE	TIME	REMARKS
Relinquished by: Vance Atkins			3/21/06	1525	
Received by:			3:21:06	1525	
Relinquished by:					
Received by:					