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January 31, 2019

Sam Meng
Washington State Department of Ecology
Northwest Regional Office
3190 - 160th Ave. SE
Bellevue, Washington 98008-5452

SUBJECT **Remedial Investigation Report**
Bothell 76 / Unocal 5905 / The Market at Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington 98003

Dear Mr. Meng,

At the request of Brent Johnson, Aerotech Environmental Consulting, Inc. ("Aerotech") has prepared the enclosed *Remedial Investigation* Revision 1 which summarizes environmental investigation activities to date as well as the most recent confirmation sampling completed in January 2019. As described in the enclosed report, Aerotech requests an opinion from the Washington State Department of Ecology regarding meeting the substantive requirements of the MTCA.

Aerotech and Mr. Brent Johnson appreciate your assistance in the matter. Please do not hesitate to contact the myself, (425) 923 7468 with any questions.

Sincerely,

Justin Foslien
Licensed Geologist WA #2504
Email: justin@dirtydirt.us

ENCLOSURE
Aerotech 's *Remedial Investigation*, Revision 1 dated January 31, 2019

REMEDIAL INVESTIGATION REPORT

Performed at:
Bothell 76/Unocal 5905
18015 Bothell Way Northeast
Bothell, Washington 98011

AEROTECH
Environmental Consulting Inc.

January 31, 2019

Anchorage Seattle Portland

Cost-effective environmental solutions
for the western United States and Alaska

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Remedial Investigation Report

Report Version: Revision 1

Site Name:	Bothell 76/Unocal 5905
Site Address:	18015 Bothell Way Northeast Bothell, Washington 98011
Alternate Location Info:	King County, Washington Parcel Number: 072605-9114

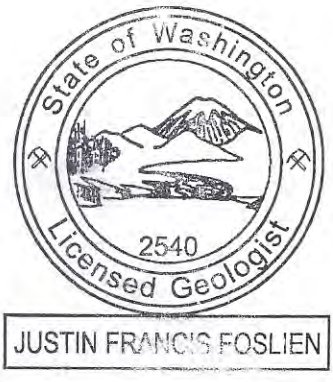
Ecology Facility Site ID No.:	35644949
Cleanup Site No.:	8853
Voluntary Cleanup Program Project No.:	NW3177

Prepared By:
Justin Foslien
Aerotech Environmental Technology Inc.
13925 Interurban Ave South Suite 210
Seattle, Washington 98168

Prepared For:
Brent Johnson
Federal Way Union Inc.
18015 Bothell Way Northeast
Bothell, Washington 98011

Signature:

Date: 01/31/2019



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ACRONYMS AND ABBREVIATIONS

Aerotech	Aerotech Environmental Consulting, Inc
AMSL	Above Mean Sea Level
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
bgs	below ground surface
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
COC	Contaminant/Chemical of Concern
CSCSL	Confirmed and Suspected Contaminated Sites List
CSID	Cleanup Site Identification number
CSM	Conceptual Site Model
CUL	Clean-up Levels
Ecology	Washington State Department of Ecology
FSID	Facility Site Identification Number
HVOCs	Halogenated Volatile Organic Compounds
MTCA	Model Toxics Control Act
PID	Photoionization Detector
PCBs	Polychlorinated Biphenyls
PVC	Polyvinyl Chloride
RI	Remedial Investigation
TEE	Terrestrial Ecological Evaluation
TPH	Total Petroleum Hydrocarbon
TPHg	Total Petroleum Hydrocarbon – Gasoline Range
TPHd	Total Petroleum Hydrocarbon – Diesel Range
TPHo	Total Petroleum Hydrocarbon – Heavy Oil Range
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
WAC	Washington State Administrative Code

EXECUTIVE SUMMARY

Bothell 76 / Unocal 5905 / The Market at Bothell Landing, the subject Property (King County Tax Parcel No. 072605-9114), is a trapezoidal-shaped approximately 0.73-acre (31,841 square foot) Parcel located on the northwest corner of the intersection of Northeast 180th Street and Bothell Way Northeast (State Route 522) in Bothell, Washington (Figure 1). Located in a commercial area (GC), the Site is developed with a 2,488-square foot masonry building originally constructed in 1993. Prior to this development, the Site was Unocal Service Station #5905. From 1993 until 2013 the Site was operated as Chevron Extra Mile & Car Wash. The first-generation service station facilities were constructed in 1967. In 1993 the former Unocal facilities were demolished including: a service station with five service bays, three 10,000-gallon underground storage tanks (USTs), one 550-gallon underground heating oil tank, one underground waste oil tank and an aboveground propane tank with two covered fuel dispenser islands with a kiosk. The current Site facilities include: a convenience store; a car wash; two fuel islands covered by a canopy; a 12,000-gallon and two 8000-gallon unleaded gasoline tanks; a 6000-gallon diesel tank and associated fuel conveyance system piping.

GeoEngineers oversaw the advancement of four soil borings completed as monitoring wells (MW-1 through MW-4) in November 1989. Gasoline related contamination was detected in the samples collected from downgradient monitoring well MW-1 and a release was reported to Ecology January 1990 associated with LUST ID number 455.

In May of 2017, a VCP application was submitted to Ecology on behalf of Mr. Brent Johnson, the current owner of the Site property. Ecology rejected the application and requested an additional report summarizing the work completed at the Site prior to acceptance in the program and the issuance of an opinion letter.

GeoEngineers observed the demolition of service station facilities at the Site and excavation of contaminated soil from February 1991 to February 1992. Widespread soil contamination was observed and removed from the areas of the former USTs, beneath the former station building and areas of the former dispenser islands. According to GeoEngineers, all contaminated soil encountered at the Site was excavated and removed with one exception. A small area of gasoline contaminated soil was not removed due to the close proximity of the eastern property boundary and Bothell Way Northeast.

Soil: Previous excavation activity completed at the Site has removed most of residual hydrocarbons in soil above the Model Toxics Control Act ("MTCA") Method A Cleanup Level. Approximately 2150 cubic yards of petroleum contaminated soil were removed when the previous generation of USTs, dispenser islands and station building were demolished in several phases between 1991 and 1992. According to GeoEngineers, the edge of the public right of way on the southeast property boundary prevented the removal of additional petroleum contaminated soil. The limited extent of soil in the vicinity of FIE-7 represents the remaining gasoline left in place in the vicinity of FIE7 above the MTCA Method A Cleanup Level.

Groundwater: Groundwater monitoring wells at the Site have previously verified the presence of petroleum related hydrocarbons leaching to groundwater. Samples collected from MW1, MW3, MW5 MW9 and MW10 contained concentrations of dissolved hydrocarbons between 1991 and 1994. The current monitoring wells present at the Site include MW5, MW9 and MW10. Samples collected in 2017 indicate dissolved hydrocarbons are no longer present beneath the Site. Monitoring well MW10 is in close proximity to the location of remaining soil sample FIE-7 above MTCA Method A Cleanup Levels.

Confirmation Borings and Groundwater Monitoring: According to the soil sample collected in October of 1991, soil remains at concentrations above MTCA Method A Cleanup Levels at FIE-7. Twenty-six years have elapsed since the collection of this sample allowing sufficient time for biological activity and attenuation of elevated concentrations of TPHg and benzene to reduce below Method A

Cleanup Levels. This has been confirmed by three soil samples collected by Aerotech in January 2019 confirming the any remaining concentrations of TPHg and BTEX associated with FIE-7 are no longer above MTCA Method A Cleanup Level.

Additionally, groundwater monitoring events completed in 2017 from monitoring wells where previous concentrations of dissolved hydrocarbon occurred above MTCA Method A Cleanup Levels, contained no concentrations of dissolved hydrocarbons, indicating what soil is remaining in this area is protective of the groundwater pathway.

Aerotech recommends requesting an opinion from Ecology according to the substantive requirements of the MTCA. Definition of the historical petroleum related release described in this report has been sufficiently characterized by TPH, TPHg, TPHd, TPHo, BTEX and lead and in soil and groundwater at the Site. No additional action is necessary at the Site to protect human health and the environment from the historical petroleum release.

1. INTRODUCTION

The purpose of this Remedial Investigation ("RI") is to characterize the nature and extent of contamination at the Site. Aerotech Environmental Technology, Inc ("Aerotech") was retained by Mr. Brent Johnson to summarize the work completed at the Site and obtain an opinion from the Voluntary Cleanup Program ("VCP") regarding the substantive requirements of the MTCA.

Under MTCA, 173-340-200 Washington Administrative Code ("WAC") the Site is defined by the nature and extent of contamination associated with one or more releases of hazardous substances prior to any cleanup of the contamination. Aerotech has completed several investigations to define the Site based on previous release of petroleum hydrocarbons; however, the data indicates petroleum related compounds exist beyond the parcel boundaries. Furthermore, it appears more than one source may be contributing to the existing plume with soil and groundwater from an adjacent property parcel, as historically the parcel was subdivided from a larger parcel when the release occurred. It is Aerotech's intent to utilize the information summarized in this report to facilitate access on adjacent properties to ultimately define the nature and extent of the Site.

1.1. GENERAL SITE INFORMATION

Site Name:	Bothell 76/Unocal 5905
Site Address:	18015 Bothell Way Northeast Bothell, Washington 98011
Facility Site Identification number (FSID):	35644949
Cleanup Site Identification number (CSID):	8853
Voluntary Cleanup Program (VCP):	NW3177
Project Consultant:	Aerotech Environmental Consulting, Inc.
Project Consultant Contact Information:	Justin Foslien 13925 Interurban Avenue South, Suite No. 210 Seattle, Washington 98168 (206) 257-4211 justin@dirtydirt.us
Property Owner:	Brent Johnson 18015 Bothell Way Northeast Bothell, Washington 98011 206) 300-7829 brent04@comcast.net

1.2. SITE LOCATION/DEFINITION

Bothell 76 / Unocal 5905, the subject Property (King County Tax Parcel No. 072605-9114), is a trapezoidal-shaped approximately 0.73-acre (31,841 square foot) Parcel located on the northwest corner of the intersection of Northeast 180th Street and Bothell Way Northeast (State Route 522) in Bothell, Washington (Figure 1). Located in a commercial area (GC), the Site is developed with a 2,488-square

foot masonry building originally constructed in 1993. Prior to this development, the Site was Unocal Service Station #5905. From 1993 until 2013 the Site was operated as Chevron Extra Mile & Car Wash. The first-generation service station facilities were constructed in 1967. In 1993 the former Unocal facilities were demolished including: a service station with five service bays, three 10,000-gallon underground storage tanks ("USTs"), one 550-gallon underground heating oil tank, one underground waste oil tank and an aboveground propane tank with two covered fuel dispenser islands with a kiosk. The current Site facilities include: a convenience store; a car wash; two fuel islands covered by a canopy; a 12,000-gallon and two 8000-gallon unleaded gasoline tanks; a 6000-gallon diesel tank and associated fuel conveyance system piping.

The Property is located on the northwest corner of Bothell Way Northeast and 180th Street in Bothell, Washington. The Property located in a general commercial area. The King County Assessor tax parcel numbers for the Property is 072605-9114, with a description of the Northeast quarter of Section 7, Township 26N; Range 5E. The property coordinates are: Latitude 47 Degrees, 45 Minutes, 31.65 Seconds; Longitude 122 Degrees, 12 Minutes, 40.33 Seconds. The parcel is shown on Figure 2.

The MTCA site ("Site") is defined by the extent of release to soil and groundwater of gasoline, diesel and oil range petroleum hydrocarbons; benzene, toluene, ethylbenzene and xylenes ("BTEX"); and lead associated with 18015 Bothell Way Northeast in Bothell, Washington ("the Property").

1.2.1. SURROUNDING AREA DESCRIPTION:

The Property is located near the north central portion of a commercial area which is situated along Bothell Way Northeast adjacent to the east and Northeast 180th Street adjacent to the south (Figure 3). Additional commercial properties as parts of the Bothell Landing redevelopment lie to the north. Bothell Landing Park and the Sammamish River are southeast across Bothell Way Northeast.

1.2.2. PHYSIOGRAPHIC SETTING/TOPOGRAPHY

The site is located within the northern portion of the Puget Sound Lowland physiographic province. The Puget Sound Lowland is a north-south trending trough between the Olympic Mountains to the west and the Cascade Mountains to the east. Elevation in the lowlands ranges from sea level up to several hundred feet above mean sea level. The topography is dominated by north-south trending valley and low nearly flat-topped highlands eroded by streams. The surface of the Property is generally flat with a slight downward slope toward the east and southeast and lies at an elevation of approximately 45 feet above mean sea level ("AMSL"; Figure 4; Google Earth, 2017).

1.3. SITE HISTORY

The Site is developed with a 2,488-square foot masonry building originally constructed in 1993. Prior to this development, the Site was Unocal Service Station #5905. From 1993 until 2013 the Site was operated as Chevron Extra Mile & Car Wash. The first-generation service station facilities were constructed in 1967. In 1993 the former Unocal facilities were demolished including: a service station with five service bays, three 10,000-gallon USTs, one 550-gallon underground heating oil tank, one underground waste oil tank and an aboveground propane tank with two covered fuel dispenser islands with a kiosk. The current Site facilities include: a convenience store; a car wash; two fuel islands covered by a canopy; a 12,000-gallon and two 8000-gallon unleaded gasoline tanks; a 6000-gallon diesel tank and associated fuel conveyance system piping.

GeoEngineers oversaw the advancement of four soil borings completed as monitoring wells (MW-1 through MW-4) in November 1989. Gasoline related contamination was detected in the samples collected from downgradient monitoring well MW-1 and a release was reported to Ecology January 1990 associated with LUST ID number 455.

GeoEngineers observed the demolition of service station facilities at the Site and excavation of contaminated soil from February 1991 to February 1992. Widespread soil contamination was observed and removed from the areas of the former USTs, beneath the former station building and areas of the former dispenser islands. According to GeoEngineers, all contaminated soil encountered at the Site was

excavated and removed with one exception. A small area of gasoline contaminated soil was not removed due to the close proximity of the eastern property boundary and Bothell Way Northeast.

1.4. PREVIOUS SITE ASSESSMENT

GeoEngineers completed a subsurface investigation at the Site in November 1989 that consisted of four borings drilled via hollow stem auger and completed as 2-inch monitoring wells (MW-1 through MW-4). A sample from each soil boring was analyzed for BTEX by EPA method 8020 and total petroleum hydrocarbons ("TPH") by EPA method 418.1. BTEX constituents were not detected in any of the soil samples tested. TPH was not detected in any of the samples except one collected from MW-3 (in the vicinity of the USTs) at a depth of 3 feet below ground surface (bgs). All of the soil samples collected were either not detected or were detected below the concentrations of the MTCA Method A soil screening levels. Further information may be found in GeoEngineers' *Report of Geotechnical Services Former Unocal Service Station 5905* dated January 24, 1990.

Subsequent samples of the groundwater analyzed for BTEX via 8020 and TPH via method 418.1 in water indicated concentrations of BTEX above groundwater screening levels in monitoring well MW-2. Specifically, samples collected from MW-1 contained concentrations of benzene at 120 micrograms per liter (µg/L), toluene at 47 µg/L, ethylbenzene at 110 µg/L, xylenes at 610 µg/L, and 1,000 µg/L of TPH.

GeoEngineers observed the demolition of service station facilities at the Site and excavation of contaminated soil from February 1991 to February 1992. Widespread soil contamination was observed and removed from the areas of the former USTs, beneath the former station building and areas of the former dispenser islands. All contaminated soil encountered at the Site was excavated and removed with one exception. According to GeoEngineers, a small area of gasoline contaminated soil was not removed due to the close proximity of the eastern property boundary and Bothell Way Northeast. Monitoring wells MW1, MW2, and MW4 were destroyed during the excavation activities.

To evaluate the potential presence and extent of groundwater impacted by petroleum compounds after excavation activities, six new monitoring wells were installed at the Site in March of 1992 (MW5 through MW10; Figure 5). Contamination related to gasoline was detected in the groundwater collected from MW-10, located in near the former eastern dispenser island. Evidence of heavier petroleum hydrocarbons diesel and oil range was detected in the groundwater sample collected from MW9, located in the backfill of the excavation near the former USTs. The concentrations detected were below the MTCA Method A groundwater screening levels. Further information may be found in GeoEngineers' *Report of GeoEnvironmental Services, Underground Storage Removal and Remedial Excavation Activities Former Unocal Service Station 5905* dated May 15, 1992.

Monitoring well MW11 was installed in September 1992 by GeoEngineers to evaluate groundwater conditions off-property. GeoEngineers placed the downgradient well southeast in the direction of groundwater flow. Further information may be found in GeoEngineers' *Progress Report No. 1 Quarterly Groundwater Monitoring and Supplemental Subsurface Investigation Former Unocal Service Station 5905* dated January 24, 1993.

1.5. SITE USE

1.5.1. CURRENT PROPERTY USES AND FACILITIES

The current Site facilities include: a convenience store; a car wash; two fuel islands covered by a canopy; a 12,000-gallon and two 8000-gallon unleaded gasoline tanks; a 6000-gallon diesel tank and associated fuel conveyance system piping.

1.5.2. PROPOSED OR POTENTIAL FUTURE SITE USES

Planned use for the Property is to continue as a convenience store, a car wash and fuel service station. There are no Plans for redevelopment currently. The parcel is zoned as general commercial use (Figure 3).

1.5.3.REGULATORY STATUS

In May of 2017, a VCP application was submitted to Ecology on behalf of Mr. Brent Johnson, the current owner of the Site property. Ecology rejected the application and requested an additional report summarizing the work completed at the Site prior to acceptance in the program and the issuance of an opinion letter.

A Remedial Investigation report dated October 30, 2017, summarizing the work completed at the Site was submitted to Ecology for review. The latest opinion letter dated October 8, 2018 issued from Ecology determined additional remedial actions are necessary to clean up contamination at the Site.

Ecology also had the following comments:

1. *Ecology concurs additional soil samples are needed in the area, represented by soil sample FIE7 (Figure 3), to assess the current conditions of the remaining PCS. Please refer to the sampling analysis protocol described in Tables 7.2 & 7.3, pages 104-106 of the Guidance for Remediation of Petroleum Contaminated Sites and Table 830-1, pages 251-252 of the Model Toxics Control Act Regulation and Statue.*
2. *If field screening indicates presence of PCS in a soil boring, also collect a groundwater sample from the same location and analyze for COPCs.*
3. *If additional data show that concentrations of COPCs exceeding their CULs are still present in the FIE7 area, delineate the lateral and vertical extent of PCS, and potentially groundwater. As such, subsequent submittal of the proposed investigation locations to Ecology is encouraged prior to commencing field activities.*
4. *Ecology concurs it would be prudent to assess the soil-vapor pathway when the additional data are available. Please reference the current EPA and Ecology reference documentation pertaining to this pathway3.*
5. *As the current conditions of the remaining contamination is unknown, establishment of cleanup standards, is premature at this time. Evaluate cleanup standards upon obtaining additional information.*
6. *Please also revise, as necessary, the terrestrial ecological evaluation form when additional data are available. The Site may meet criteria for determining that no further evaluation is required (WAC 173-340-7491).*
7. *Please consider MTCA model remedies4 when the site characterization is completed, as appropriate.*
8. *In accordance with WAC 173-340-840(5) and Ecology Toxics Cleanup Program Policy 840 (Data Submittal Requirements), data generated for Independent Remedial Actions shall be submitted simultaneously in both a written and electronic format. For additional information regarding electronic format requirements, see the website http://www.ecy.wa.gov/eim. Be advised that according to the policy, any reports containing sampling data that are submitted for Ecology review are considered incomplete until the electronic data has been entered. Please ensure that data generated during on-site activities is submitted pursuant to this policy. Data must be submitted to Ecology in this format for Ecology to issue a No Further Action determination. Please be sure to submit all soil and groundwater data collected to date, as well as any future data, in this format. Data collected prior to August 2005 (effective date of this policy) is not required to be submitted; however, you are encouraged to do so if it is available. Be advised that Ecology requires up to two weeks to process the data once it is received.*

1.5.4.TRANSPORTATION/ROADS

The Property is located on the northwest corner of the intersection of Northeast 180th Street and Bothell Way Northeast. Ormbreck Street runs east-west along the northern boundary of the property. The street

ends currently at the northeast corner of the property. Bothell Way Northeast also known as State Route 522 along this segment runs immediately adjacent to the southeast of the property. Access to Interstate 5 is located about 1 ¼ miles east along State Route 522 at exit 23A and B (Google 2017).

1.5.5. UTILITIES AND WATER SUPPLY

Utility corridors including sanitary sewer, storm sewer and water are located beneath Ormbrek Street along the northern property boundary, and beneath Northeast 180th Street along the southern property boundary (Figure 7)

Two oil-water separator collection drains separate drips of gas, diesel, oil and grease from water prior to flowing to treatment via the sanitary sewer. One is associated with the runoff collection in the vicinity of the dispenser canopy and the other is associated with runoff collected in the car wash. These flows intersect in a sewer line that flows southeast to the main interceptor beneath Bothell Way Northeast.

Stormwater surface runoff is collected via five catch basins along the southeast edge of the property. A sixth catch basin is located in front of the convenience store. They collect and drain the site in a 6-inch PVC that flows to 30-inch and then 70-inch corrugated metal pipe. This pipe flows across Bothell Way Northeast and then flows south to an outfall in the Sammamish River.

A fire hydrant exists in the northwest corner of the parcel and is sourced from Bothell Water district. Water is supplied by the City of Bothell by Seattle Public Utilities which is sourced primarily from the Tolt River and Cedar River watersheds (SPU, 2017). The nearest potable water well is located approximately 1 mile to the north of the Property (Health, 2017).

1.6. POTENTIAL SOURCES OF HYDROCARBONS

The Site was originally developed prior to 1936 with a single-family residence on the west side of the parcel. In 1968, the original station building was constructed with two service bays by the Union Oil Company. At that time, two 10,000-gallon gasoline tanks and one 280-gallon waste oil tank were installed. In 1991 the western half of the building was demolished to allow for the removal of underground tanks. The freestanding 1,800 square foot car wash was constructed in 1992. In 1993, a new building was constructed in the current configuration and the canopy was completed. At that time, four double-walled fiberglass underground tanks were installed: one 6,000-gallon diesel, two 8,000-gallon unleaded gasoline, and one 12,000-gallon unleaded gasoline all with interstitial monitoring. In 2002, the automatic car wash equipment was replaced. The former and current USTs and the fuel conveyance system including the fuel dispensers are considered a potential source of hydrocarbons.

2. FIELD INVESTIGATIONS

2.1. PREVIOUS ENVIRONMENTAL INVESTIGATIONS

Several investigations completed at the Bothell 76/Unocal 5905 Site are summarized in the following reports:

- GeoEngineers. January 24, 1990. *Report of Geotechnical Services Subsurface Contamination Study.*
- GeoEngineers. June 4, 1991. *Project Status Underground Storage Tank Removal.*
- GeoEngineers. May 15, 1992. *Report of Geoenvironmental Services Underground Storage Tank Removal and Remedial Excavation Activities.*
- GeoEngineers. January 24, 1993. *Progress Report No. 1 Quarterly Groundwater Monitoring and Supplemental Subsurface Investigation.*
- GeoEngineers. March 30, 1993. *Report of Geoenvironmental Services Supplemental Subsurface Investigation and Remedial Excavation Activities.*

A summary of historical soil analytical data and historical groundwater analytical data can be found in Tables 1 and 2, respectively. All historical boring logs are included in Appendix A as well as boring logs for work completed in Aerotech's January 2019 site assessment. Laboratory analytical reports for soil samples collected during the January 2019 site assessment are included in Appendix B. All currently existing wells and soil boring locations are shown on Figures 2, 5 and 6. All activities completed by Aerotech were in accordance with Aerotech Field Protocols (Appendix C) and selected photos from the investigation may be found in Appendix D.

2.2. ENVIRONMENTAL INVESTIGTION SUMMARY

Eleven groundwater monitoring wells have been installed at the Site (MW1 through MW11). The soil analytical results can be found in Table 1 and Figures 2 and 6. Groundwater analytical results are summarized in Table 2, stockpile sample results are summarized in Table 3.

2.2.1. CONSTITUENTS OF POTENTIAL CONCERN

Constituents of potential concern ("COPCs") based on current and past uses of the Property include the compounds listed in WAC Chapter 173-340-900 Table 830-1 Required Testing for Petroleum Releases. The following table lists COPCs for the Site:

Potential Source	COPCs
Former Gasoline Service Station Tanks and Fuel Conveyance System **Former Hydraulic Hoists** **Former Car Wash**	• TPHg • TPHd • TPHo • BTEX • HVOCs • PAHs • PCBs • Total Lead

Based on the laboratory analytical results from environmental activities conducted at the Site, concentrations of TPHg, TPHd, TPHo and BTEX have been detected above MTCA Method A screening levels in groundwater and soil samples.

2.2.2. SOIL

Locations of soil samples are depicted on Figures 2 and 6. Soil samples have been analyzed for Total

Petroleum Hydrocarbon – Gasoline Range ("TPHg"), Total Petroleum Hydrocarbon – Diesel Range ("TPHd"), Total Petroleum Hydrocarbon – Heavy Oil Range ("TPHo") BTEX, Halogenated Volatile Organic Compounds ("HVOCs"), Polychlorinated Biphenols ("PCBs") and lead. Laboratory analytical results indicated TPHg, TPHd, TPHo and BTEX above the MTCA Method A screening levels. The depths of the soil samples range from 1.5 to 15 feet bgs. A summary of laboratory analytical results, sample depth, and sample date for each soil sample submitted for analysis is presented in Table 1.

2.2.3. SURFACE WATER

Surface water has not been observed on the Property.

2.2.4. GROUNDWATER

Four groundwater monitoring wells (MW-1 through MW-4; Figure 5) were installed at the Site in November 1989. Subsequent samples of the groundwater indicated concentrations of BTEX above MTCA Method A screening levels in monitoring well MW-2. Monitoring wells MW1, MW2, and MW4 were destroyed during the excavation activities.

Six new monitoring wells were installed at the Site in March of 1992 (MW5 through MW10; Figure 5). Contamination related to gasoline was detected in the groundwater collected from MW-10, located in near the former eastern dispenser island. Evidence of heavier petroleum hydrocarbons diesel and oil range was also detected in the groundwater sample collected from MW9, located in the backfill of the excavation near the former USTs.

Monitoring well MW11 was installed in September 1992 to define extent of impacted groundwater in the southeast direction.

A summary of laboratory analytical results, and sample date for each groundwater sample submitted for analysis is presented in Table 2.

2.2.5. SEDIMENT

Sediment has not been observed on the Property.

2.2.6. AIR/SOIL VAPOR

To evaluate the potential air/soil pathway Aerotech utilized the Modified Approach for Assessing the Vapor Intrusion Pathway for Sites with Petroleum Contamination taken from the *Updated Process for Initially Assessing the Potential for Petroleum Vapor Intrusion - Toxics Cleanup Program Implementation Memorandum No. 14* (Ecology, 2016):

1) An initial release to the environment occurred based on the previous investigation data and regulatory records did occur;
2) No immediate action was necessary;
3) Site conceptual model based on characterization data has been completed;
4) No other volatile contaminants other than petroleum have been identified;
5) No precluding factors are present at the Site;
6) The previous locations of elevated hydrocarbons occurred in the areas which are less than 30 feet laterally from the Site building;
7) Samples collected at the Site ranged in depth from 3 – 12 feet bgs. The 5 foot interval samples do not meet the vertical screening distance of 6 ft;
8) Therefore, a Tier 1 assessment approach is appropriate.

A Tier I assessment evaluates the site areas identified in the Preliminary Assessment and determines which areas – or which portions of these areas – may potentially be threatened by VI. For the *Bothell*

76/Unocal 5905 Site, no current soil samples collected have contained VOCs above laboratory reporting limits. Since no VOCs have been detected in the soil above Method A Screening Levels, the subsurface contaminant concentrations will be too low to potentially result in unacceptable indoor air concentrations in any site area. Furthermore, groundwater samples are also below MTCA Method a Screening Levels.

The protection of the air/soil vapor pathway is complete, and no further evaluation is necessary.

2.2.7. NATURAL RESOURCES/WILDLIFE

A Terrestrial Ecological Evaluation ("TEE") form has been completed as part of the previously submitted VCP Application and can be found in the Appendix E. Further details are discussed in Section 3.4.2.

2.2.8. CULTURAL HISTORY/ARCHEOLOGY

No information or reports of historical investigations have indicated a need for additional research of Property history or archaeology.

2.2.9. INTERIM ACTIONS

B & C (B & C Equipment Company) excavated and removed six USTs, two sets of product lines, four hydraulic hoists and two sumps, and demolished and removed the station building and canopy from the site between February 26 and October 8, 1991. The approximate former locations of the USTs, product lines, hydraulic hoists, sumps, the limits of the excavations and the discrete soil sample locations are shown in Figures 2 and 6. B & C also was responsible for the excavation of petroleum contaminated soil encountered at the site. A representative of GeoEngineers was present to observe removal of the USTs, product line, hydraulic hoist, sump, and to obtain soil samples from the limits of the remedial excavations. Soil removed from the excavations was placed in temporary on-site stockpiles. The stockpiles were segregated according to the type and relative degree of contamination based on field screening. Soil samples were collected from the stockpiles. Stockpiled oil contaminated soil was subsequently transported to the Roosevelt Landfill in Klickitat County (operated by Rabanco, Inc.) for disposal. Stockpiled soil with contaminant concentrations less than cleanup levels was transported to Coal Creek Landfill in King County for disposal. All soil volumes presented in the remainder of this report are based on GeoEngineers review of landfill tickets from Coal Creek Landfill and Roosevelt Landfill. The tickets from Roosevelt Landfill are in units of tons. An assumed conversion factor of 1.5 tons per cubic yard was used to convert tons to cubic yards.

Groundwater was encountered at a depth of approximately 7 feet in the excavation completed for removal of the USTs. Groundwater was pumped from the excavation and discharged to the sanitary sewer. To more effectively evaluate the degree of soil contamination at the base of the excavation, to facilitate excavation activities and to help remediate contaminated groundwater. GeoEngineers obtained permission from the METRO (Municipality of Metropolitan Seattle) Industrial Waste Section on May 9, 1991, and from the City of Bothell on May 16, 1991, to discharge a maximum of 25,000 gallons of groundwater a day from open excavations into the sanitary sewer. Observations made by GeoEngineers noted during removal of the service station facilities and remedial excavation activities are discussed in chronological order below. Samples collected during the excavation activity and the final limits of excavation are shown in Figures 2 and 6.

FEBRUARY 1991

Hydraulic Hoist Removal

One hydraulic hoist was removed from the center service bay of the service station building on February 26, 1991. Moderate soil contamination, based on field screening, was observed in the excavation completed for removal of the hoist. The excavation was extended laterally and downward to a depth of about 9 feet. Groundwater was encountered at a depth of about 8 feet. Four discrete soil samples (H-1 through H-4) obtained from the limits of the hydraulic hoist excavation were analyzed for gasoline-

range, diesel-ranged and heavier hydrocarbons. Petroleum hydrocarbons either were not detected in the soil samples or were detected at concentrations less than the MTCA Method A soil screening levels. Soil chemical analytical results are summarized in Table 1. The approximate soil sample locations are shown in Figure 5.

Approximately 20 cubic yards of soil from the hydraulic hoist excavation was stockpiled on site. One composite sample (SP-l(A)) was obtained from the stockpiled soil and analyzed for gasoline-range, diesel-range and heavier hydrocarbons. Gasoline- and diesel-range hydrocarbons were not detected in sample SP-l(A). The concentration of heavier hydrocarbons (180 mg/kg) in sample SP-1A was less than the MTC Method A screening level. The stockpile remained on site until February 1992 when it was then transported to Roosevelt Landfill for disposal. Samples of contaminated stockpiles are presented in Table 3. Additional stockpile sample results have been also included in Appendix F.

MAY 1991

Main Excavation

The three gasoline USTs, one heating oil UST and one waste oil UST were removed from a single excavation between May 8 and May 10, 1991. The tanks were removed from the site on May 10, 1991. The gasoline USTs and waste oil UST appeared to be in good condition, with minor pitting and rust observed on the middle and western gasoline USTs and the waste oil UST.

Pitting was observed on the outside of the heating oil tank. Rust was observed on the outside of the tank. A film of product was observed adhering to the outside of the lower one third of the heating oil tank.

Backfill surrounding the tanks consisted of medium sand. Medium dense to dense native sand with gravel and silt lenses, overlying gravel with sand was observed in the walls of the excavation. Gravel with sand was observed in the base of the excavation. Groundwater was encountered at a depth of about 7 feet in the excavation. The approximate locations of the former tanks are shown in Figures 2 and 6.

Field screening indicated the presence of moderate gasoline-related soil contamination around the gasoline USTs and extensive oil-related soil contamination around the heating oil and waste oil USTs. Based on field screening results, the main excavation was extended eastward to within 2 feet of the service station building. Field screening indicated that a zone of oil-related soil contamination, extending from a depth of about 6 feet to 12 feet, was present in the east wall and the eastern portion at the north wall of the main excavation. This zone of contaminated soil appeared to extend beneath the service building.

Ten soil samples (G-1 through G-10) were obtained from the limits of the main excavation in the vicinity of the gasoline USTs and submitted for chemical analysis of BTEX, gasoline-range hydrocarbons and diesel-range hydrocarbons. BTEX, gasoline-range hydrocarbons and diesel-range hydrocarbons either were not detected or were detected at concentrations less than the MTCA Method A soil screening levels in samples G-1 through G-9. BTEX was detected at concentrations less than the screening levels in sample G-10. Gasoline-range hydrocarbons were detected in sample G-10 at a concentration of 170 mg/kg. Diesel-range hydrocarbons were not detected in sample G-10. Sample G-10 was obtained from beneath the south end of the center gasoline UST.

Two soil samples (O-1 and O-2) were obtained from the eastern wall of the main excavation to confirm field screening results indicating that oil-related contamination extended beneath the service station building. Samples O-1 and O-2 were submitted for chemical analyses of gasoline-range, diesel-range and heavier hydrocarbons. Diesel-range hydrocarbons were detected in samples O-1 and O-2 at concentrations of 1,500 mg/kg and 2,400 mg/kg, respectively. Heavier hydrocarbons were detected in samples O-1 and O-2 at concentrations of 2,600 mg/kg and 3,100 mg/kg, respectively.

Three soil samples (HW-1 through HW-3) were obtained from the main excavation in the vicinity of the heating oil and waste oil USTs. The samples were submitted for chemical analyses of gasoline-range, diesel-range and heavier hydrocarbons. Gasoline-range, diesel-range and heavier hydrocarbons were not detected in samples HW-1, HW-2 and HW-3. In addition, sample HW-3 was analyzed for HVOCs. HVOCs were not detected.

Soil chemical analytical results for samples G-1 through G-10, O-1 and O-3, and HW-1 through HW-3 are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Approximately 80 cubic yards of gasoline-contaminated soil and 60 cubic yards of noncontaminated soil were excavated during removal of the USTs and stockpiled separately on site. Four composite soil samples (SP-l(B) and DSP-1 through DSP-3) were obtained from the gasoline-contaminated soil stockpile and were submitted for chemical analysis of BTEX, gasoline-range and diesel-range hydrocarbons, HVOCs, PCBs, and/or TCLP metals. Gasoline-range hydrocarbons were detected at a concentration exceeding the screening level in DSP-1. Other analytes either were not detected or were detected at concentrations less than applicable cleanup levels. Composite soil samples were obtained from the noncontaminated stockpile in September 1991.

Approximately 50 cubic yards of oil-contaminated soil was removed from the main excavation and stockpiled on site. One composite sample (WOSP-1) was obtained from the stockpile and submitted for chemical analysis of gasoline-range, diesel-range and heavier hydrocarbons. Diesel-range hydrocarbons were detected at a concentration of 12 mg/kg in sample WOSP-1. Heavier hydrocarbons were detected at a concentration of 130 mg/kg. Samples of contaminated stockpiles are presented in Table 3. Additional stockpile sample results have been also included in Appendix F.

Groundwater was encountered at a depth of about 7 feet in the excavation. In order to more effectively evaluate the degree of soil contamination at the base of the excavation, to facilitate excavation activities, and to help remediate contaminated groundwater, groundwater was pumped from the excavation and discharged to the sanitary sewer. A total of approximately 9,300 gallons of groundwater was discharged to the sanitary sewer on May 15 and May 16, 1991.

Product Line Removal

The steel and fiberglass product lines were excavated and removed between May 8 and May 13, 1991. The product lines appeared to be in good condition. Field screening did not indicate the presence of petroleum-related contamination around the product lines; however, it indicated the presence of extensive gasoline-related soil contamination beneath several of the product dispensers.

Eight discrete soil samples (PL-1 through PL-5, PL-7, PL-12 and PL-13) were obtained from the product line excavations between May 8 and May 16, 1991. In addition, five soil samples (PL-6 and PL-8 through PL-11) were obtained from beneath the product dispensers, and five soil samples (IFI-1 and OH-1 through OFI-4) were obtained from adjacent to the canopy footings. Approximate soil sample locations are shown in Figures 2 and 6.

The soil samples were analyzed for BTEX, gasoline-range and diesel-range hydrocarbons. BTEX, gasoline-range and/or diesel-range hydrocarbons were detected at concentrations exceeding the MTCA Method A screening levels in samples PL4 and PL-9 through PL-11, obtained from beneath the product dispensers, and in OFI-1, obtained from adjacent to the northeast canopy footing. BTEX, gasoline-range and diesel-range hydrocarbons either were not detected or were detected at concentrations less than the cleanup levels in samples PL-1 through PL-5, PL-7, PL-8, PL-12, IFI-1 and OFI-2 through OFI-4. Soil chemical analytical results are summarized in Table 1.

Test Pits

Eleven test pits (TP-1 through TP-11) were excavated between May 14 and May 21, 1991. Test pits TP-2, TP-3 and TP-6 through TP-11 were completed to evaluate the extent of contamination encountered at the site. Test pits TP-1 and TP-4 were excavated near catch basins outside the service station building and TP-5 was excavated at the proposed future location of new underground storage tanks. Test pits TP-2, TP-3, TP-6 and TP-7 were excavated to evaluate the extent of gasoline-related soil contamination in the vicinity of the service islands. Test pits TP-4 and TP-8 through TP-10 were excavated to evaluate the extent of oil- or diesel-related soil contamination detected in the east wall of the main excavation. Approximate test pit locations are shown in Figures 2 and 6.

Sixteen soil samples were obtained from the test pits and analyzed for BTEX, gasoline-range, diesel-range and heavier hydrocarbons. Petroleum-related soil contamination either was not detected or was detected at concentrations less than the MTC Method A screening levels in samples obtained from the

test pits. Soil chemical analytical results are summarized in Table 1.

The soil excavated from the test pits was replaced in the test pits following sample collection activities.

SEPTEMBER AND OCTOBER 1991

Partial Building Demolition

A review of chemical analytical and field screening results from the main excavation indicated that petroleum-related soil contamination remained in the base, the eastern portion of the north wall, and the east wall of the May 1991 tank excavation. The east wall of the tank excavation was within 2 feet of the service station building. The data and field observations indicated that the contamination observed in the east wall of the excavation extended beneath the service station building. B & C demolished and removed the two southern service bays of the building, including roof, walls, floor slab, two hydraulic hoists and a sump to enable the excavation of petroleum contaminated soil from under the building. The eastern service island was demolished, and the northeast corner of the canopy was shored in preparation for excavation in the area of the eastern service island.

Main Excavation Remediation and Undocumented UST Removal

A small volume of gasoline-contaminated soil was excavated from the base of the main excavation in the area represented by sample G-10. The excavation extended to a final depth of 13 feet in this area. Field screening indicated that gasoline-related soil contamination was not present in the new base. A discrete sample (G-12) was obtained from the extended base and submitted for chemical analysis of BTEX, gasoline-range and diesel-range hydrocarbons. BTEX, gasoline-range and diesel-range hydrocarbons were not detected in sample G-12.

Sample HW-4 was obtained from the same location as sample HW-3 to clarify laboratory QA/QC (quality analysis/quality control) exceptions associated with sample HW-3. Methylene Chloride, a common laboratory contaminant, was detected in the method blank and the HW-3 sample.

Samples G-11, G-13 and G-14 were obtained from areas of the main excavation that were not sampled previously. Samples G-11, G-13 and G-14 were submitted for chemical analysis of BTEX, gasoline-range and diesel-range hydrocarbons. BTEX, gasoline-range and diesel-range hydrocarbons were not detected.

Noncontaminated overburden soil was excavated to a depth of about 6 feet in the area formerly occupied by the southern two service bays of the service station building. The noncontaminated soil was stockpiled on site. Beginning at a depth of about 6 to 7 feet, field screening indicated the presence of oil-related soil contamination extending to a depth of about 11 feet. The excavation was continued eastward, with the excavated noncontaminated soil being segregated from the excavated contaminated soil, until it became difficult to stockpile any more soil on site. Field screening indicated the presence of oil-related soil contamination extending from approximately 6 feet to 11 feet in the north, east and south walls of the new portion of the main excavation.

Thirteen soil samples (O-3 through O-9 and O-11 through O-16) were obtained from the limits of the excavation completed beneath the former south end of the service station building. The samples were submitted for chemical analysis of heavy hydrocarbons. In addition, soil samples O-3, O-7, O-9 and O-14 were analyzed for gasoline-range and diesel-range hydrocarbons and samples O-3 and O-7 were analyzed for HVOCs. Heavy hydrocarbons and gasoline-range hydrocarbons were detected at concentrations greater than applicable soil cleanup levels in sample O-7. An examination of the chromatogram from sample O-7 indicated that the product present was probably a combination of Stoddard solvent and hydraulic oil. Sample O-7 was obtained from a depth of 7.5 feet, from the portion of the excavation completed adjacent to the south wall of the undemolished portion of the service station building. Heavy hydrocarbons either were not detected or were detected at concentrations less than the soil cleanup level in the remainder of the samples submitted. Gasoline-range and diesel-range hydrocarbons were not detected in sample O-3. Methylene chloride was detected at a concentration less than the soil cleanup level in sample O-3. Methylene chloride also was detected at a similar concentration in the laboratory reagent blank, indicating laboratory cross-contamination. Ethylbenzene, methylene chloride and xylenes were detected in sample O-7 at concentrations less than the soil cleanup

levels. Methylene chloride also was detected in the laboratory reagent blank, but at a concentration much less than the reported concentration in sample O-7. Soil chemical analytical results are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Oil-contaminated soil remaining in the north wall of the main excavation, in the vicinity of the former heating oil and waste oil USTs, was excavated in October 1991. During excavation activities in this area, an undocumented 550-gallon steel UST was partially uncovered on October 4, 1991. The approximate location of this undocumented tank is shown on Figure 6. The UST was buried about 1.5 feet beneath the surface. The tank was in poor condition; extensive rust and corrosion were observed on its exterior surface. The tank was approximately two-thirds full of pea gravel and a petroleum-like product. One sample (T-1) was obtained from the pea gravel and product mixture in the tank and analyzed for gasoline-range and diesel-range hydrocarbons. Diesel-range hydrocarbons were detected in sample T-1 at a concentration of 23,000 mg/kg.

The undocumented UST was excavated and removed on October 8, 1991. Based on a review of analytical data for sample T-1, Rabanco approved disposal of the pea gravel and product mixture at the Roosevelt Landfill. The mixture was removed from the tank and subsequently added to other contaminated soil that had been approved for disposal at the landfill. Field screening indicated that the soil immediately surrounding the undocumented tank was petroleum-contaminated. The UST was excavated and removed on October 8, 1991. Sample O-10 was obtained on October 4, 1991 from soil beneath the undocumented UST and submitted for chemical analysis of gasoline-range hydrocarbons, diesel-range hydrocarbons and heavier hydrocarbons. Diesel-range hydrocarbons and heavier hydrocarbons were detected at concentrations exceeding the MTCA Method A soil screening levels in sample O-10.

The excavation for the undocumented UST was extended downward and laterally until field screening results did not indicate the presence of petroleum-related contamination in the limits of the excavation. Six soil samples (O-17 through O-22) were obtained from the limits of the main excavation in the vicinity of the undocumented UST.

Samples O-17 through O-22 were submitted for chemical analysis of heavier hydrocarbons. The concentration of heavier hydrocarbons in sample 0-17, obtained from west of the undocumented UST, exceeded the soil cleanup level. Heavier hydrocarbons either were not detected or were detected at concentrations less than the soil cleanup levels in the remainder of the soil samples obtained from the limits of the excavation in the vicinity of the undocumented UST. Soil chemical analytical results are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Approximately 16,500 gallons of groundwater were pumped from the main excavation and discharged into the sanitary sewer from October 1 through October 10, 1991.

Approximately 850 cubic yards of oil-contaminated soil were removed from the main excavation in September and October 1991. Composite samples (OSPN-1 through OSPN-13) were obtained from the soil stockpile and submitted for chemical analysis of heavier hydrocarbons. Three samples (OSPN-3, OSPN-6 and OSPN-9) were also analyzed for HVOCs, semivolatile organics, PCBs and TCLP metals. Samples OSPN-1 through OSPN-7, OSPN-9, OSPN-10, OSPN-12 and OSPN-13 had concentrations of heavier hydrocarbons exceeding the soil screening level. Heavier hydrocarbons were detected at concentrations less than the soil cleanup level in samples OSPN-8 and OSPN-11. HVOCs, semivolatile organics, PCBs and TCLP metals either were not detected or were detected at concentrations less than the soil screening levels in samples OSPN-3, OSPN-6 and OSPN-9. Soil chemical analytical results are summarized in Tables 3. Additional stockpile sample results have been also included in Appendix F.

Composite soil samples (OSPN-14 through OSPN-21) were obtained on December 2, 1991 to further characterize the oil-contaminated stockpile, Samples OSPN-14 through OSPN-20 were submitted for chemical analysis of diesel-range hydrocarbons. Samples OSPN-15 and OSPN-16 were also analyzed for HVOCs, BTEX, PCBs and TCLP metals. A TCLP extraction from sample OSPN-21 was analyzed for PCBs, volatile organics by EPA Method 8240, semivolatile organics and metals. A fish bioassay also was performed on sample OSPN-21. These analyses were performed at the request of several different landfills being evaluated as options for soil disposal. Diesel-range hydrocarbons were detected

in samples OSPN-14 through OSPN-17, and OSPN-19 at concentrations exceeding the soil cleanup level. Diesel-range hydrocarbons were detected in samples OSPN-18 and OSPN-20 at concentrations less than the soil cleanup level. HVOCs, BTEX, PCBs and TCLP metals either were not detected or were detected at concentrations less than the soil cleanup levels in samples OSPN-15 and OSPN-16. Leachable barium was detected in sample OSPN-21 at a concentration of 0.54 mg/kg. The remainder of the compounds analyzed for in sample OSPN-21 were not detected. A zero percent mortality was observed during the fish bioassay performed on OSPN-21. Soil stockpile chemical analytical results are summarized in Table 3 and Appendix F.

Approximately 290 cubic yards of noncontaminated soil were removed from the main excavation in September and October 1991 and added to the stockpile of approximately 60 cubic yards of noncontaminated soil excavated in May 1991. Twelve discrete samples (CSP-A through CSP-L) were obtained from the noncontaminated stockpile on September 30 and October 1, 199 1 and were composited by the laboratory into six composite samples (CSP-A/B, CSP-C/D, CSP-E/F, CSP-G/H, CSP-I/J and CSP-K/L) for chemical analysis of heavier hydrocarbons. Three samples (CSP-C/D, CSP-G/H and CSP-K/L) were also analyzed for gasoline-range and diesel-range hydrocarbons. Heavier hydrocarbons were detected at concentrations less than soil screening levels. Gasoline-range and diesel-range hydrocarbons were not detected in the three samples tested. Soil chemical analytical results are summarized in Table 3 and Appendix F.

Hoist and Sump Removal

A dual post hydraulic hoist with a hydraulic fluid reservoir, and a sump were excavated and removed from the center two of the remaining four bays in the service station building on October 7, 1991. Field screening of the soil surrounding the hoist and sump indicated the presence of petroleum-related contamination. Pipes connected to the sump were observed to be corroded. Approximately 20 cubic yards of oil-contaminated soil were excavated to facilitate removal of the hoist and sump. The soil was stockpiled on site. Approximate locations of the hoist and sump are shown in Figures 2 and 6.

Soil samples HH-1 through HH-3 and S-1 were obtained from the hoist and sump excavations to confirm the presence of the petroleum-related contamination indicated by field screening results. Samples HH-1 through HH-3 and S-1 were submitted for chemical analysis of heavier hydrocarbons and/or gasoline-range and diesel-range hydrocarbons. The approximate sample locations are shown in Figure 4. Heavy hydrocarbons were detected at concentrations exceeding the Method A soil screening levels in HH-1, HH-3 and S-1. Heavier hydrocarbons were detected at a concentration less than the screening level in HH-2. Diesel-range hydrocarbons were detected at a concentration less than the soil screening level in sample HH-3. Diesel-range hydrocarbons were detected at a concentration exceeding the soil screening levels in sample S-1. GeoEngineers' inspection of the chromatogram indicated that the contaminant in sample S-1 was a combination of diesel and hydraulic fluid. S-1 also was tested for the presence of HVOCs. Methylene chloride was detected in S-1 at a concentration of 0.18 mg/kg. A similar concentration of methylene chloride was detected in the laboratory blank, indicating laboratory cross contamination. Soil chemical analytical results are summarized in Table 1.

Central Service Island Excavation

Field screening and laboratory results from samples PL-9, PL-10, PL-11 and OFI-1 indicated that gasoline-related soil contamination remained under the eastern service island. Based on field screening, contaminated soil was excavated and removed from beneath the northern portion of the service island between September 30 and October 3, 1991. The excavation completed for the removal of contaminated soil beneath the northern portion of the eastern service island will be referred to as the central service island excavation.

Gasoline-contaminated soil was removed from the central service island excavation and stockpiled on site. The final excavation extended to approximate depths ranging between 10 feet and 15 feet. Field screening indicated that gasoline-related soil contamination was still present in the northern portion of the east wall of the final excavation limits. Gasoline-related soil contamination did not appear to remain at the limits of the remainder of the excavation, based on field screening. Nine soil samples (FIE-1 through FIE-9) were obtained from the final limits of the excavation and were analyzed for gasoline-

range and diesel-range hydrocarbons and BTEX. Samples FIE-1, FIE-3, FIE4 and FIE-8 were also analyzed for total lead. Gasoline-range hydrocarbons and BTEX were detected at concentrations exceeding soil screening levels in sample FIE-7. This sample was obtained from the northeast corner of the central service island excavation (Figure 6). According to GeoEngineers, the northeast corner could not be excavated further because of the close proximity to the sidewalk at the property boundary. Gasoline-range and diesel-range hydrocarbons and BTEX were not detected in the remainder of the central service island excavation samples. Total lead was not detected in samples FIE-1, FIE-3, FIE4 or FIE-8. Soil chemical analytical results are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Approximately 100 cubic yards of gasoline-contaminated soil were removed from the central service island excavation and stockpiled temporarily on site adjacent to the existing gasoline-contaminated soil stockpile. Five composite soil samples (GSPN-1 through GSPN-5) were obtained from the stockpiled soil from the central service island excavation. The soil samples were submitted for chemical analysis of gasoline-range and diesel-range hydrocarbons and BTEX. Gasoline-range hydrocarbons were detected at concentrations of 930 mg/kg in GSPN-1 and 180 mg/kg in GSPN-4. Xylenes were detected in sample GSPN-1 at a concentration exceeding the soil screening level for xylenes. Gasoline- and diesel-range hydrocarbons and BTEX either were not detected or were detected at concentrations less than the soil screening levels in the remaining stockpile samples.

The stockpile of gasoline-contaminated soil removed from the central service island excavation was spread and allowed to aerate for one week. At the end of this time, six composite samples (GSPN-6 through GSPN-11) were obtained and analyzed for gasoline- and diesel-range hydrocarbons and BTEX. Gasoline-range hydrocarbons were detected in sample GSPN-6 at a concentration of 100 mg/kg. Gasoline- and diesel-range hydrocarbons and BTEX either were not detected or were detected at concentrations less than the soil screening levels in the remaining samples. Soil chemical analytical results are summarized in Table 3 and Appendix F.

Six composite soil samples (GSPO-1 through GSPO-6) were obtained from the 150 cubic yards of soil in the existing gasoline-contaminated stockpile. The samples were submitted for laboratory analysis of gasoline- and diesel-range hydrocarbons and BTEX. Petroleum-related compounds either were not detected or were detected at concentrations less than soil screening levels in samples GSPO-1 through GSPO-6.

FEBRUARY 1992

Complete Building and Canopy Demolition

A review of chemical analytical and field screening results indicated that petroleum-related soil contamination remained in the northeast and south walls of the main excavation, beneath the portion of the service station building demolished in September 1991. In addition, petroleum-related soil contamination remained in the west wall of the main excavation, west of the undocumented tank location; in the soil surrounding the sump and hydraulic hoist removed from the northern undemolished portion of the service station building; and beneath both service islands. Because of the presence of petroleum-related soil contamination immediately adjacent to and beneath the remaining portion of the service station building, Unocal made the decision to demolish the remainder of the service station building and the canopy. Demolition was completed by B & C before February 12, 1992.

Stockpile Disposal

Based on the laboratory results from composite soil samples GSPO-1 through GSPO-6 and GSPN-6 through GSPN-11, the King County Department of Public Health approved the two stockpiles of soil removed from gasoline-contaminated areas for disposal at the Coal Creek Landfill in King County, Washington. Based on laboratory results from composite soil samples WOSP-1, SP-l(A), SP-1(B)), OSPN-1 through OSPN-7, and OSPN-14 through OSPN-21, Rabanco Regional Landfill Company approved disposal of the stockpile of oil-contaminated soil at their Roosevelt Regional Landfill in Klickitat County, Washington. In addition, the approval from Rabanco allowed any further soil excavated at the site with similar contaminant types and concentrations to be disposed of at Roosevelt Landfill without further review by Rabanco. From February 10 to February 12, 1992, about 250 cubic

yards of soil stockpiled on-site were transported to Coal Creek Landfill for disposal and about 900 cubic yards of soil stockpiled on-site were transported to Seattle, where it was then taken by rail to Roosevelt Landfill for disposal. These volumes are based on landfill ticket receipts. The tickets Coal Creek Landfill provided were in cubic yards. The tickets Roosevelt Landfill provided were in tons; we converted tons to cubic yards using an assumed conversion factor of 1.5 tons per cubic yard.

Main Excavation

Excavation of oil-contaminated soil began in February 1992 on the southern wall of the main excavation, beneath the southern end of the former service station building. Based on field screening, the upper 7 feet of soil was segregated as noncontaminated. Contaminated soil was excavated to a depth of about 12 feet, where the base of the contamination was encountered. This portion of the excavation was extended south and east until field screening indicated that contaminated soil was no longer present. Four soil samples (O-23 through O-26) were obtained from the limits of this portion of the excavation on February 11, 1991 and submitted for chemical analysis of gasoline-range, diesel-range and heavier hydrocarbons. Gasoline-range, diesel-range and heavier hydrocarbons were not detected in samples O-23 through O-26. Soil chemical analytical results are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Approximately 200 cubic yards of oil-contaminated soil were removed from the southern portion of the excavation and was loaded directly into trucks for disposal at Roosevelt Landfill. Approximately 150 cubic yards of apparently noncontaminated soil was stockpiled on site. Three composite soil samples (CNSP-1 through CNSP-3) obtained from the noncontaminated stockpile were submitted for chemical analysis of gasoline-range, diesel-range and heavier hydrocarbons. Heavier hydrocarbons were not detected in samples CNSP-1 through CNSP-3. Diesel-range hydrocarbons were detected in sample CNSP-3 at a concentration of 41 mg/kg. Gasoline- and diesel-range hydrocarbons were not detected in samples CNSP-1 and CNSP-2. Stockpile soil chemical analytical results are summarized in Table 3 and Appendix F.

Excavation of contaminated soil from the western wall of the main excavation, in the vicinity of the former undocumented UST, was completed on February 12, 1992. Approximately 15 cubic yards of soil were removed and placed in trucks for disposal at Roosevelt Landfill. One discrete soil sample (O-27) was obtained from the new western limit of the excavation and submitted for chemical analysis of gasoline-range and diesel-range and heavier hydrocarbons. Gasoline-range, diesel-range and heavier hydrocarbons were not detected in sample O-27. Soil chemical analytical results are summarized in Table 5. The approximate location of sample O-27 is shown in Figures 2 and 6.

Excavation of oil-contaminated soil was continued on the north wall of the main excavation, beneath the former service station building, beginning on February 12, 1991. Field screening indicated the presence of oil-related contamination extending from a depth of about 7 feet to 9 feet. Approximately 20 cubic yards of oil-contaminated soil was loaded directly onto trucks for disposal at Roosevelt Landfill. Two composite soil samples (RSP-1 and RSP-2) were obtained from the 35 cubic yards of soil that was excavated from the undocumented UST area and from the sump hoist area and loaded directly into trucks. These samples were submitted for chemical analysis of gasoline-range and diesel-range hydrocarbons and/or heavier hydrocarbons. Heavier hydrocarbons were detected at a concentration less than the soil cleanup level in RSP-1. Heavier hydrocarbons were detected at a concentration of 200 mg/kg in sample RSP-2, equal to the soil cleanup level. Gasoline- and diesel-range hydrocarbons were not detected in RSP-2. Stockpile soil chemical analytical results are summarized in Table 3 and Appendix F.

As the excavation continued north, toward the locations of the sump and hydraulic hoist removed in October 1991, field screening indicated that the contaminant type was changing to an apparently more volatile nature. Because of the change in the nature of the contaminant, the soil was no longer loaded directly into trucks for disposal at Roosevelt Landfill, but was stockpiled on site for further characterization. The soil removed from the main excavation in the vicinity of the northern hoist and sump on February 12 and February 13 was segregated into stockpiles according to field screening results.

In the immediate areas of the northern sump and hoist, field screening indicated the presence of contaminated soil extending from the surface to a depth of 11 feet. The excavation was extended east until field screening indicated that contaminated soil was no longer present. The final excavation in this northern extension of the main excavation ranged in depth from 4 feet to 11 feet below grade surface.

Seventeen discrete soil samples (HH-4 through HH-8, HS-2 through HS-9, and O-28 through O-31) were obtained from the limits of the excavation in the vicinity of the former hydraulic hoist and sump and analyzed for gasoline-range, diesel-range and heavier hydrocarbons. Samples HH-8, HS-2, HS-3, HS-5 and HS-9 were also analyzed for BTEX. Petroleum-related compounds either were not detected or were detected at concentrations less than the soil screening levels in samples HH-4 through HH-8, HS-2 through HS-9, and O-28 through O-31. Soil chemical analytical results are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Two composite soil samples (OSPN-14 and OSPN-15) were obtained from the stockpile consisting of soil removed from the hoist and sump area that appeared contaminated by field screening. This stockpile consisted of approximately 175 cubic yards. The samples were submitted for chemical analysis of gasoline-range, diesel-range and heavier hydrocarbons and/or HVOCs. Gasoline-range hydrocarbons were detected at a concentration of 115 mg/kg in OSPN-15, exceeding the soil screening level of 100 mg/kg for gasoline. Heavier hydrocarbons also were detected in OSPN-15, at a concentration of 270 mg/kg, exceeding the soil cleanup level of 200 mg/kg. Our inspection of the chromatogram indicated that the contaminant in OSPN-15 was probably Stoddard solvent. HVOCs and heavier hydrocarbons were detected at concentrations less than soil cleanup levels in sample OSPN-14. Soil chemical analytical results are summarized in Table 3A.

Two composite soil samples (CNSP-4 and CNSP-5) were obtained from the stockpile consisting of soil which appeared noncontaminated by field screening. This stockpile consisted of approximately 80 cubic yards. The samples were submitted for chemical analysis of gasoline-range, diesel-range and heavier hydrocarbons. Petroleum hydrocarbons were not detected in samples CNSP4 and CNSP-5. Stockpile soil chemical analytical results are summarized in Table 3 and Appendix F

Approximately 4,350 gallons of groundwater were pumped from the main excavation and disposed of in the sanitary sewer between February 14 and February 18, 1992.

NORTH AND SOUTH SERVICE ISLAND EXCAVATIONS

Field screening and laboratory results from samples PL-6 and PL-9 indicated that gasoline-related soil contamination remained under the north end of the western service island and the south end of the eastern service island. Excavation of gasoline-contaminated soil from beneath the western service island was completed on February 13 and February 14, 1992. The excavation completed for removal of contaminated soil beneath the northern portion of the western service island will be referred to as the north service island excavation.

Five discrete soil samples (FIE-16 through FIE-20) were obtained from the limits of the north service island excavation and submitted for chemical analysis of BTEX, gasoline-range and diesel-range hydrocarbons. BTEX and gasoline- and diesel-range hydrocarbons were not detected in samples FIE-16 through FIE-20. Soil chemical analytical results are summarized in Table 1. Approximate soil sample locations are shown in Figures 2 and 6.

Information provided by Unocal indicated that a gasoline dispenser was formerly located beneath the south end of the kiosk building on the western service island. To assess the potential presence of gasoline-related contamination originating from this former dispenser, the concrete slab of the fuel island was removed at the south end of the kiosk and the soil beneath was field screened. Field screening results did not indicate the presence of petroleum-related soil contamination. GeoEngineers obtained sample FIE-15 from a depth of about 3 feet at this location to confirm the absence of petroleum-related contamination. Sample FIE-15 was submitted for chemical analysis of BTEX, gasoline-range and diesel-range hydrocarbons. Petroleum-related compounds were not detected. Soil chemical analytical results are summarized in Table 1. The approximate soil sample location is shown in Figure 6.

Gasoline-contaminated soil was excavated from the beneath the southern end of the eastern service

island between February 17 and February 20, 1992. This excavation is referred to as the south service island excavation. Field screening indicated that gasoline-related soil contamination was not present at the excavation limits.

Seven discrete soil samples (FIE-21 through FIE-27) were obtained from the limits of the south service island excavation on February 17 and February 18, 1992. These samples were submitted for chemical analysis of BTEX and gasoline- and diesel-range hydrocarbons. Diesel-range hydrocarbons were detected at a concentration exceeding the soil screening level in FIE-24, obtained from the base of the south service island excavation at a depth of 9 feet. Additional excavation of less than 10 cubic yards of soil occurred on February 20, 1992 at the base of the south service island excavation, in the area represented by FIE-24. The excavation was extended to a final depth of 11 feet in this area. A discrete soil sample (FIE-28) was obtained and submitted for chemical analysis of BTEX and gasoline- and diesel-range hydrocarbons. Petroleum-related compounds were not detected in sample FIE-28. Soil chemical analytical results are summarized in Table 1.

Approximately 200 cubic yards of gasoline-contaminated soil were removed from the north and south service island excavations and stockpiled on-site. Four composite soil samples (PISP-1 through PISP-4) were obtained from the stockpile and submitted for chemical analysis of BTEX and gasoline- and diesel-ranged hydrocarbons. Gasoline- and diesel-range hydrocarbons were detected at concentrations exceeding the soil screening levels in PISP-3. BTEX was not detected in PISP-3. Petroleum-related hydrocarbons either were not detected or detected at concentrations less than cleanup levels in PISP-1, PISP-2 and PISP-4. Soil chemical analytical results are summarized in Table 3A. Approximately 20 cubic yards of noncontaminated overburden soil were removed from the north and south service island excavations and stockpiled on site. A composite soil sample (CNSP4) was obtained from the stockpile and submitted for chemical analysis of BTEX, gasoline-range, diesel-range and heavier hydrocarbons. Heavier hydrocarbons were detected at a concentration of 200 mg/kg. B & C placed this stockpile with the gasoline-contaminated stockpile for disposal purposes. Stockpile soil chemical analytical results are summarized in Table 3 and Appendix F.

SEPTEMBER 1992

Test Pit Explorations

Subsurface soil contamination in the northern portion of the site was encountered when excavating the trenched for VES piping.

The soil contamination encountered while excavating the VES trenching was evaluated by excavating 7 test pits (TP-1-92 through TP-7-92). The test pits were excavated on September 18, 23, and 24 1992 to a depth of approximately 8 feet each. Approximate test pit locations are shown in Figure 2.

Nine soil samples were obtained from the test pits for field screening and chemical analyses of petroleum compounds. In addition, a soil sample ("Drain Pipe") was collected from beneath a concrete drain pipe extending to a catch basin. The drain pipe was exposed during trenching for the VES piping. The sample names and location identification with chemical analyses are summarized in Table 1.

Sump Excavation

On a September 25, 1992 a concrete sump associated with the former car wash was exposed during on-site excavation activities. A second sump was encountered during the removal of the first. The sumps were used as separators of soap suds and particulates from soapy water, prior to recycling of the water for the car wash. GeoEngineers observed the soil conditions surrounding the sump removal activities on September 28 and 29, 1992.

The sumps appeared to be in generally good condition prior to removal. Each had a capacity of approximately 700-gallons. According to GeoEngineers, there was visible sheen on the sludge removed from the sumps. Glacier Environmental Services contained the sludge in drums and arranged for disposal. The excavation to remove the sumps extended to 7 feet below grade.

NORTH EXCAVATION

On December 2, 1992 GeoEngineers monitored the excavation of PCS in the vicinity of TP-1-92 and

TP-3-92. The north excavation was completed to a depth of approximately 9 feet below grade.

Seven samples of soil were collected (N-1 through N-7) from the final limits of the excavation and submitted for chemical analyses of diesel- and oil-range hydrocarbons. Sample N-2 was also analyzed for volatile organic compounds. Soil chemical analyses are summarized in Table 1 and the approximate location of the samples with the limits of the excavation are presented in Figure 2. Approximately 225 cubic yards of petroleum contaminated soil was removed from the north Excavation.

Summary of Soil Disposal

In February 1992, approximately 250 cubic yards of successfully treated soil, formerly contaminated with gasoline, was transported to Coal Creek Landfill for disposal. Concurrently, approximately 900 cubic yards of oil-contaminated soil was transported to Roosevelt Landfill for disposal.

In March 1992, approximately 200 cubic yards of noncontaminated soil were transported to Coal Creek Landfill for disposal. Concurrently, approximately 550 cubic yards of oil-contaminated soil were transported to Roosevelt Landfill for disposal.

In December 1992, approximately 250 yards of petroleum contaminated soil was removed and transported to Roosevelt Landfill for disposal.

In total, approximately 2150 cubic yards of soil was transported offsite for disposal.

Approximately 100 cubic yards of noncontaminated soil were used to backfill a portion of the main excavation.

2.3. SITE CHARACTERIZATION - JANUARY 2019

Aerotech completed Soil Borings B1–B5 to determine the current soil conditions in the immediate vicinity of historical confirmation sample FIE-7 (Figures 2 and 6).

2.3.1. NOTIFICATIONS – "PUBLIC UTILITIES"

A public utility locate notification was performed prior to the start of work. Aerotech performed the "public" utilities notification on December 27, 2018 and was issued Ticket Number 18540698 by the Utilities Underground Location Center.

According to the Utilities Underground Location Center the utilities necessary for notification included:

District	Company	Marking	Customer	Repair
BOTHEL01	CITY OF BOTHELL	(425)471-2475	(425)488-0118	(425)471-2475
CC7721	COMCAST CABLE	(800)778-9140	(800)934-6489	(855)537-6296
ELCLT04	ZAYO FNA INTEGRA TELECOM	(888)267-1063	(443)403-2023	(888)267-1063
GTE01	FRONTIER COMMUNICATIONS NW	(800)778-9140	(877)462-8188	(877)462-8188
KCMTRO01	KING CNTY METRO SEWER	(206)263-5722	(206)263-3700	(206)263-3840
PUGE03	PUGET SOUND ENERGY ELECTRIC	(888)728-9343	(888)225-5773	(888)225-5773
PUGG03	PUGET SOUND ENERGY GAS	(888)728-9343	(888)225-5773	(888)225-5773
SCPW01	SNOHOMISH COUNTY PUBLIC	(425)388-7551	(425)388-6420	(425)388-7551
WDOTNW05	WSDOT MTCE AREA 5	(425)739-3700	(425)739-3700	(206)440-4490
WSDOT12	WSDOT - SIGNAL BRANCH OFFICE	(206)442-2110	(206)442-2110	(206)442-2110

2.3.2. PRIVATE UTILITIES LOCATION:

Additionally, Aerotech engaged personnel of Mountain View Locating Services of Bonney Lake, Washington to locate building and site utilities on January 4, 2019, prior to the start of the on Site drilling activities. No unanticipated or unexpected situations were discovered or encountered during the "private" locating activities.

Based in part upon pavement markings made by utility location technicians; the location of utility fixtures such as water, electrical, or manholes, and the presence of anomalies detected by induction or ground radar methodologies, monitoring well soil boring locations were chosen.

2.3.3. GROUND PENETRATING RADAR SURVEY:

A Ground Penetrating Radar ("GPR") Survey conducted by Mountain View Locating Services staff on January 4, 2019 in order to augment the induced current methodology, and to verify the presence of utility trenches such as sewer and water main trenches. Mr. Dave Schaff of Mountain View Locating Services, LLC employed Radar equipment utilizing Dual Frequency Antennae (300 MHz/800 MHz) manufactured by Geophysical Survey Systems. The locations of the water main and storm sewers were confirmed by means of GPR activities.

2.3.4. SITE ACTIVITIES:

Five soil borings were advanced on January 4, 2019, under contract with Aerotech Environmental Consulting, Inc. All the work was performed during normal business hours. No unusual or unforeseen circumstances occurred during the Site activities.

2.3.5. DRILLING ACTIVITIES:

Drilling operations utilized a Jackhammer-mounted Limited Access Direct Push Rig, equipped with 2-inch diameter, four-foot long stainless-steel sampling rods.

The subsurface soil borings were performed by equipment owned and operated by a Licensed Driller from Standard Environmental Probe (“Standard”) of Tacoma, Washington. The on-Site drilling equipment was operated by personnel employed by Standard, Mr. Russell Vaughn (State of Washington Department of Ecology Well Drillers License No. 3143). All subsurface work was overseen by State of Washington Licensed Geologist, Mr. Justin Foslien (State of Washington License No. 2320). The laboratory analytical services were performed by a State of Washington licensed lab, Advanced Analytical Labs located in Redmond, Washington.

2.3.6. SOIL BORINGS:

A total of five soil borings were advanced in the immediate vicinity of historical confirmation sample FIE-7. Soil Boring B1 was advanced at the location of FIE-7 to confirm the current soil conditions. Soil Borings B2-B5 were step out locations to define lateral extent if the samples from B1 contained concentrations of TPHg or BTEX above MTCE Method A screening levels (Figure 6).

Aerotech was prepared to collect grab groundwater samples if field observations indicated elevated petroleum hydrocarbons in the soil. No field observations indicated the presence of elevated petroleum hydrocarbons at any of the locations advanced; therefore, no grab groundwater samples were collected from the soil borings.

2.3.7. SOIL SAMPLE COLLECTION:

A total of 6 discrete soil samples were collected on January 3, 2018 at 5 soil boring locations. An additional sample was collected on January 22, 2019 from B1 to collect the exact same depth interval of historical confirmation sample FIE-7.

Soils collected from each location were visually inspected for color quality and evidence of discoloration, and physically observed for the purpose of recording composition and noting odor, where distinctive. Each sample was handled with a fresh pair of clean nitrile gloves. Samples were placed in sterile four-ounce glass jars and 40cc glass vials preserved with 5ml methanol in accordance with

procedures specified for USEPA Method 5035A.

Each sample was given a unique identifier number and placed in an iced cooler for sample preservation. Samples were held in the custody of the field project manager, Simon Payne, and ice was checked and replenished while samples were held in the evening and maintained to the time of delivery to the lab. A Chain of Custody was maintained to record details associated with the collection and handling of each sample. The remaining soil samples were retained by the laboratory for analysis if the soil samples selected for laboratory analysis revealed elevated levels of constituents. No detections were reported by the laboratory therefore no additional analyses on the step out samples as well as additional analyses for gasoline additives were requested.

2.3.8. EQUIPMENT DECONTAMINATION:

All sample acquisition equipment was decontaminated before and after the completion of each borehole to eliminate the potential for cross-contamination between borings, as required. All reusable sampling equipment for soil sampling, drive rods, and probes were decontaminated after each sampling point by washing with an Alconox-distilled water solution and rinsing with distilled water.

2.3.9. SITE RESTORATION:

Each borehole was complete with bentonite chips and gravel to match the surrounding surfaces. No landscape restoration was necessary.

2.3.10. RESULTS:

SUMMARY OF SAMPLE ACQUISITION

A total of five soil borings were advanced in the Area of Concern to a maximum depth of 12 feet bgs. A total of seventeen soil samples were collected of which 3 were analyzed. Detailed descriptions of each soil boring location, observations made during the acquisition, sampling information, and the field screening process are documented in soil boring logs attached to this report.

Total Petroleum Hydrocarbons – Gasoline and other Petroleum Constituents:

No concentrations of TPHg or BTEX above the laboratory reporting limits or the MTCA Method A screening levels were detected in any of the three soil samples. A summary of the remaining results may be found in Table 1, including results from the previous investigations.

APPLICABLE ANALYTICAL METHODOLOGIES AND PARAMETERS

The analytical parameters were chosen based upon the results of previous investigations to provide a comprehensive characterization of the subsurface soils and groundwater present at the Site Areas of Concern and to comply with State of Washington recommendations.

Analytical Methodology:

Soil: **Gasoline Range Organics & Benzene, Ethylbenzene, Toluene, and Xylenes**

State of Washington NWTPH-Gx (TPHg)

USEPA 8021B (BTEX)

Laboratory Analysis:

Laboratory analysis was provided by:

Advanced Analytical Laboratory, LLC

4078 148 Avenue NE

Redmond, WA 98052
425.702.8571
aachemlab@yahoo.com

3. NATURAL CONDITIONS

3.1. SITE GEOLOGY

The Puget Sound Region is a lowland basin created by tectonic wrenching between the Olympic Mountains to the west and the Cascade Mountains to the east. The principal aquifers in the Puget Lowlands commonly underlie the basin lowlands to depths of more than 1,000 feet. They occur within relatively permeable sand and gravel units within a series of several glacial drift deposits, separated by finer grained interglacial sediments. These aquifers receive ample recharge from the typically heavy precipitation characteristic of western Washington. The glacial drift in the Puget Sound region varies greatly in composition and water yielding capacity. Typically, wells in glacial drift that tap silt, clay, or till in the Region at approximately 75 to 100 feet below ground surface, may yield 100 gallons or more per minute. Deeper wells, tapping thick, saturated layers of highly permeable gravel and coarse sand, typically at depths greater than 250 feet below ground surface, can yield more than 1,000 gallons per minute.

The predominant sandy silty soils encountered in the investigation by GeoEngineers at the Property in, correlate with those commonly observed in Quaternary Vashon Glacial Till (Appendix A Boring Logs). This deposit consists of fine to coarse-grained silty sand with varying amounts of silt, clay and gravel. This unit is typically weathered at the surface, becoming more consolidated with increasing depth.

Soil assessments conducted by GeoEngineers indicate the Site is generally underlain by silt and sand deposits with variable moisture content from the surface to approximately 19 feet bgs, (GeoEngineers, 1990; 1992; 1993).

A Northwest-Southeast and Southwest-Northeast geologic cross section illustrating subsurface conditions observed at the Property can be found on Figure 8.

3.2. SITE HYDROGEOLOGY

The principal aquifers in the Puget Sound Region occur in glacial drift, that along with finer grained interglacial sediments, underlie the basin lowland to depths often exceeding 1,000 feet. Sand and gravel units within the glacial drift form the principle aquifers. These aquifers receive ample recharge from the typically heavy precipitation characteristic of western Washington. The glacial drift in the Puget Sound region varies greatly in composition and water yielding capacity. Typically, wells in glacial drift that tap silt, clay, or till in the region at approximately 75 to 100 feet below ground surface may have yields of 100 gallons or more per minute. Deeper wells tapping thick, saturated layers of highly permeable gravel and coarse sand, typically at depths greater than 250 feet below ground surface, can yield more than 1,000 gallons per minute.

3.2.1. GROUNDWATER CONDITIONS

Groundwater occurs in the shallow saturated zone beneath the Site comprised of silt, sandy silt, sand and gravel (GeoEngineers, 1990). The water table depth ranges between 7 and 10 feet bgs (Table 2). Previous maps depict the local flow of groundwater is toward the southeast and the Sammamish River (Figure 9, Appendix G).

The nearest production well is a private connection utilized by Friends of Youth. The well extends 90 feet deep and is located approximately 1 mile north of the Site in an upgradient direction. The effective date of the well is July 3, 1991 (designated Well #1; Health 2017). No well log was available to review.

3.3. SURFACE WATER

The Site is currently paved with concrete and asphalt. In the event of a storm water overflow at the Property, stormwater surface runoff is collected via five catch basins along the southeast edge of the property. A sixth catch basin is located in front of the convenience store. They collect and drain the site in a 6-inch PVC line that flows to a 30-inch and then to a 70-inch corrugated metal pipe. This pipe flows across Bothell Way Northeast and then flows south to an outfall in the Sammamish River.

The nearest surface water body is the Sammamish River located approximately 475 feet southeast of the Property. The Sammamish River flows west into Lake Washington approximately 2 miles west of the Site (Google Earth, 2017).

3.4. ECOLOGICAL RECEPTORS

3.4.1. SENSITIVE RECEPTOR SURVEY ANALYSIS

The nearest surface water body is the Sammamish River located approximately 475 feet southeast of the Property (Google Earth, 2017). Based on the previous removal of source areas of hydrocarbon concentrations above the MTCA Method A screening levels on the Property, it is unlikely that groundwater or soil beneath the subject property would pose a future risk to surface waters. Other potential receptors include the Park at Bothell Landing located approximately 200 feet southeast of the site across Bothell Way Northeast.

The nearest potable water well is located approximately 1-mile upgradient to the north of the Site (Health, 2017). The Property is not located within any groundwater well protection areas.

3.4.2. TERRESTRIAL ECOLOGICAL EVALUATION

A Terrestrial Ecological Evaluation (TEE) Form was completed for the Property. A Simplified TEE was completed based on approximately 4.3 acres of contiguous undeveloped land on or within 500 feet of the subject site. An aerial map with a 500-foot radius encompassing the Property can be found in Appendix E along with a completed Simplified TEE exposure analyses procedure (Table 749-1). No further evaluation was necessary because: 1) according to WAC 173-340-7492(2)(a), the area of soil contamination is less than 350 square feet; and 2) according to WAC 173-340-7492(2)(c), not contaminant listed in Table 749-2 is, or will be present in the upper 15 feet at concentrations that exceed values in Table 749-2.

4. CONCEPTUAL SITE MODEL

The conceptual site model is a "conceptual understanding of a site that identifies potential or suspected sources of hazardous substances, types and concentrations of hazardous substances, potentially contaminated media, and actual and potential exposure pathways and receptors." As defined by MTCA WAC 173-340-200 (WAC, 2017). This report has provided details regarding how COPCs were released, the types and extent of constituents detected at the Site, and actual and potential receptors. This section provides a conceptual summary of the detailed information described in the previous sections. Figure 13 presents a graphical representation of the conceptual model for the Site.

4.1. SOURCES OF CONSTITUENTS OF CONCERN

The sources of hydrocarbons on the Site are the releases to soil of COPCs that were stored and distributed by the Former UNOCAL Station 5905. These COPCs occurred via releases from USTs, pipes, and dispensers. These releases were focused in the vicinity of the first generation of UST basin and the former pump islands.

The COPCs were released to soil; the hydrocarbons then spread by vapor transport into the vadose zone, by partitioning from soil vapor into groundwater, and by direct leaching to groundwater from saturated soils. The Property is currently paved with concrete and asphalt. Therefore, the potential of infiltration of rainwater that could leach COPCs from the soil or entrain soil vapors from chemicals and carry them downward to the water table is low.

4.2. FATE AND TRANSPORT

The fate and transport of the COPCs are governed by the specific properties of the constituents and the surrounding environmental conditions at the Site. Hydrocarbons release at the Site biodegrade most rapidly under aerobic conditions. Under aerobic conditions, oxygen acts as an electron acceptor, but under anaerobic conditions naturally occurring organic matter or volatile hydrocarbons can act as the electron acceptor. The shallow water bearing zone is an oxidizing environment where naturally occurring microbes utilize hydrocarbons as a food source and proliferate until anaerobic conditions potentially occur. As a result, the transport of dissolved constituents is limited and concentrations decrease before they reach the property boundary.

Interim actions completed at the Site have removed most of residual contaminants based on confirmation samples collected and post excavation groundwater monitoring.

4.3. EXPOSURE PATHWAYS AND RECEPTORS

The Property is within a mixed residential and commercial use area that includes public streets, businesses, and other industrial activities. The streets and parking lots are covered with asphalt or concrete. There is some terrestrial habitat in the area, across Bothell Way Northeast at the Park at Bothell Landing which borders the Sammamish River. The closest private water well is located approximately 1 mile north of the site (Health, 2017). Current exposure pathways and receptors are limited to the following:

- Incidental ingestion of surface soils;
- Incidental ingestion of groundwater from leaching of soil:
- Inhalation of indoor air from volatilization of soil;
- Inhalation of outdoor air from volatilization of soil;
- Inhalation of indoor air from volatilization of groundwater; and
- Inhalation of outdoor air from volatilization of groundwater

The property is capped with asphalt and no redevelopment is planned. As such, the vapor intrusion pathway will be further evaluated based on recent guidance and planned confirmation sample data.

4.4. POTENTIAL FUTURE EXPOSURE PATHWAYS AND RECEPTORS

Future land use in the area is expected to remain general commercial, therefore the MTCA Method A and B Cleanup Levels are applicable to this Site. No significant changes in zoning are expected in the foreseeable future.

4.5. POINTS OF COMPLIANCE

Points of compliance ("POC"), locations where the cleanup levels shall be achieved, are established for each applicable media at the Site.

4.5.1. SOIL POINTS OF COMPLIANCE

The Points of Compliance for soil are based on two pathways of exposure:

- Soil direct contact – The MTCA standard POC for direct contact with soil is from the ground surface to a depth of 15 feet bgs. Compliance is determined by direct sampling of soil following the interim remediation by excavation and treatment.
- Soil leaching COPCs to groundwater – This is a cross-media pathway that concerns all Site soil that is a potential source of COPCs to groundwater. Compliance is demonstrated by delineating any COPCs vertically by obtaining soil samples containing COPC concentrations under the MTCA Method A Cleanup Level directly beneath samples above containing COPC concentrations above the MTCA Method A Cleanup Levels.
- Soil in the vadose zone causing vapor intrusion – For protection of this cross media pathway, the POC is from the surface to the uppermost groundwater observed at the Site (approximately 10 feet bgs). Compliance will be achieved by completion of Tier I/II vapor assessment outlined in Ecology's updated *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*.

4.5.2. GROUNDWATER CONDITIONAL POINTS OF COMPLIANCE

The standard POC for groundwater under MTCA is "throughout the site from the uppermost level of the saturated zone extending vertically to the lowest depth that could be potentially affected by the site" (WAC 173-340-720(8)(b)). The POC for groundwater, therefore, is the shallow saturated zone beneath the Site. Based on groundwater sample data collected at the Site in 2017, currently there are no remaining concentrations of COPCs above MTCA Method A groundwater screening levels.

4.5.3. INDOOR AIR POINT OF COMPLIANCE

The POC for ambient and indoor air is Site-wide; however, the previous excavation activity has removed most of the source of soil containing hydrocarbons. Confirmation sampling will confirm the presence or absence of a complete vapor intrusion pathway.

4.6. SOIL CLEANUP STANDARDS

The following pathways are considered for the establishment of soil cleanup levels at the Site:

- Protection of human health via direct exposure using the MTCA Method A Cleanup Levels;
- Protection of ecological receptors, an ecological evaluation is required under MTCA;
- Protection of groundwater resources from COCs leaching from soil; and
- Protection of indoor air from vapor intrusion from soil containing hydrocarbon concentrations exceeding the MTCA Method A Cleanup Levels.

In developing cleanup levels, the following Site-specific information is relevant:

- The Site and the adjacent properties are currently zoned for general commercial use (Figure 3);
- Soil containing residual COPCs is not present at the Site (Figure 6).

4.7. GROUNDWATER CLEANUP STANDARDS

The following pathways are considered for the establishment of groundwater cleanup levels at the Site:

- Protection of human health via direct exposure using the MTCA Method A Cleanup Levels;
- Protection of ecological receptors, an ecological evaluation is required under MTCA;
- Protection of groundwater resources from COCs leaching from soil; and
- Protection of indoor air from vapor intrusion from soil containing hydrocarbon concentrations exceeding the MTCA Method A Cleanup Levels.

In developing cleanup levels, the following Site-specific information is relevant:

- The Site and the adjacent properties are currently zoned for general commercial use (Figure 3);
- Groundwater containing residual COPCs is not present at the Site (Table 2).

4.8. CLEANUP STANDARDS FOR INDOOR/AMBIENT AIR, SOIL GAS, SUB-SLAB SOIL GAS

In developing cleanup levels for indoor air, the following Site-specific information is relevant:

- Soil containing residual COPCs at the Property is not present at the Site above the laboratory detection limits.
- Groundwater samples did not contain any residual COPCs above the laboratory detection limits.

4.9. CLEANUP LEVELS

CULs will be updated as additional data is collected from investigations. Based on the current conditions present at the Site, MTCA Method A is the appropriate CUL for both soil and groundwater.

	MTCA Cleanup Levels			
COPC	**Soil – Method A (mg/kg)**	**Soil – Method B Direct Contact (µg/kg)**	**Groundwater (µg/L)**	**Indoor Air (µg/m3)**
Benzene	0.030	N/A	5	N/A
Toluene	7	N/A	1,000	N/A
Ethylbenzene	6	N/A	700	N/A
Xylenes	9	N/A	1,000	N/A
TPHg	100a/30b	N/A	800a/1,000b	N/A
TPHd	2000	N/A	500	N/A
TPHo	2000	N/A	500	N/A
Lead	250	N/A	15	N/A

a = TPHg soil cleanup level is 30 mg/kg, unless benzene is not detected in the sample, or if toluene, ethylbenzene, and total xylenes constitute less than 1% of the TPHg present in the sample. If these conditions are met, the cleanup level for TPHg may be elevated to 100 mg/kg.
b = 800 mg/L if benzene is present in groundwater; 1,000 mg/L if no detectable benzene in groundwater

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1. SUMMARY AND CONCLUSIONS

Soil: Previous excavation activity completed at the Site has removed most of residual hydrocarbons in soil above the MTCA Method A Cleanup Level. Approximately 2150 cubic yards of petroleum contaminated soil were removed when the previous generation of USTs, dispenser islands and station building were demolished in several phases between 1991 and 1992. According to GeoEngineers, the edge of the public right of way on the southeast property boundary prevented the removal of additional petroleum contaminated soil. The limited extent of soil in the vicinity of FIE-7 represents the remaining gasoline left in place in the vicinity of FIE7 above the MTCA Method A Cleanup Level.

Groundwater: Groundwater monitoring wells at the Site have previously verified the presence of petroleum related hydrocarbons leaching to groundwater. Samples collected from MW1, MW3, MW5 MW9 and MW10 contained concentrations of dissolved hydrocarbons between 1991 and 1994. The current monitoring wells present at the Site include MW5, MW9 and MW10. Samples collected in 2017 indicate dissolved hydrocarbons are no longer present beneath the Site. Monitoring well MW10 is in close proximity to the location of remaining soil sample FIE-7 above MTCA Method A Cleanup Levels.

Confirmation Borings and Groundwater Monitoring: According to the soil sample collected in October of 1991, soil remains at concentrations above MTCA Method A Cleanup Levels at FIE-7. Twenty-six years have elapsed since the collection of this sample allowing sufficient time for biological activity and attenuation of elevated concentrations of TPHg and benzene to reduce below Method A Cleanup Levels. This has been confirmed by three soil samples collected by Aerotech in January 2019 confirming the any remaining concentrations of TPHg and BTEX associated with FIE-7 are no longer above MTCA Method A Cleanup Level.

Additionally, groundwater monitoring events completed in 2017 from monitoring wells where previous concentrations of dissolved hydrocarbon occurred above MTCA Method A Cleanup Levels, contained no concentrations of dissolved hydrocarbons, indicating what soil is remaining in this area is protective of the groundwater pathway.

5.2. RECOMMENDATIONS

Aerotech recommends requesting an opinion from Ecology according to the substantive requirements of the MTCA. Definition of the historical petroleum related release described in this report has been sufficiently characterized by TPH, TPHg, TPHd, TPHo, BTEX and lead and in soil and groundwater at the Site. No additional action is necessary at the Site to protect human health and the environment from the historical petroleum release.

6. LIMITATIONS

For any documents cited that were not generated by Aerotech, the data taken from those documents is used "as is" and is assumed to be accurate. Aerotech does not guarantee the accuracy of this data and makes no warranties for the referenced work performed nor the inferences or conclusions stated in these documents.

This report and the works performed have been undertaken in good faith, with due diligence and with the expertise, experience capability and specialized knowledge necessary to perform the Work in a good and workmanlike manner and within all accepted standards pertaining to providers of environmental services, in Washington at the time of investigation. No soil engineering or geotechnical references are implied or should be inferred. The evaluation of the geologic conditions at the site for this investigation is made from a limited number of data points. Subsurface conditions may vary away from these data points.

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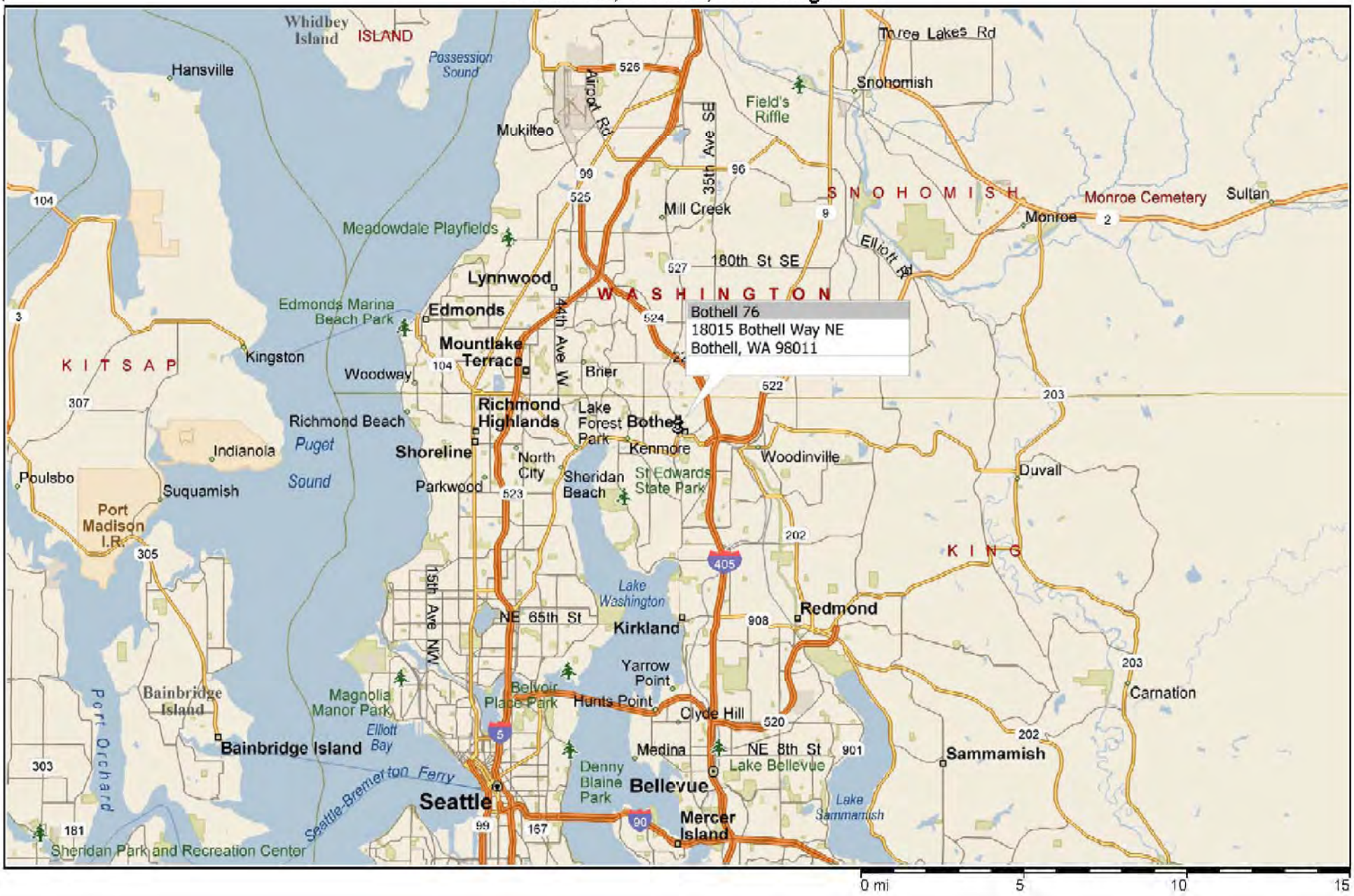
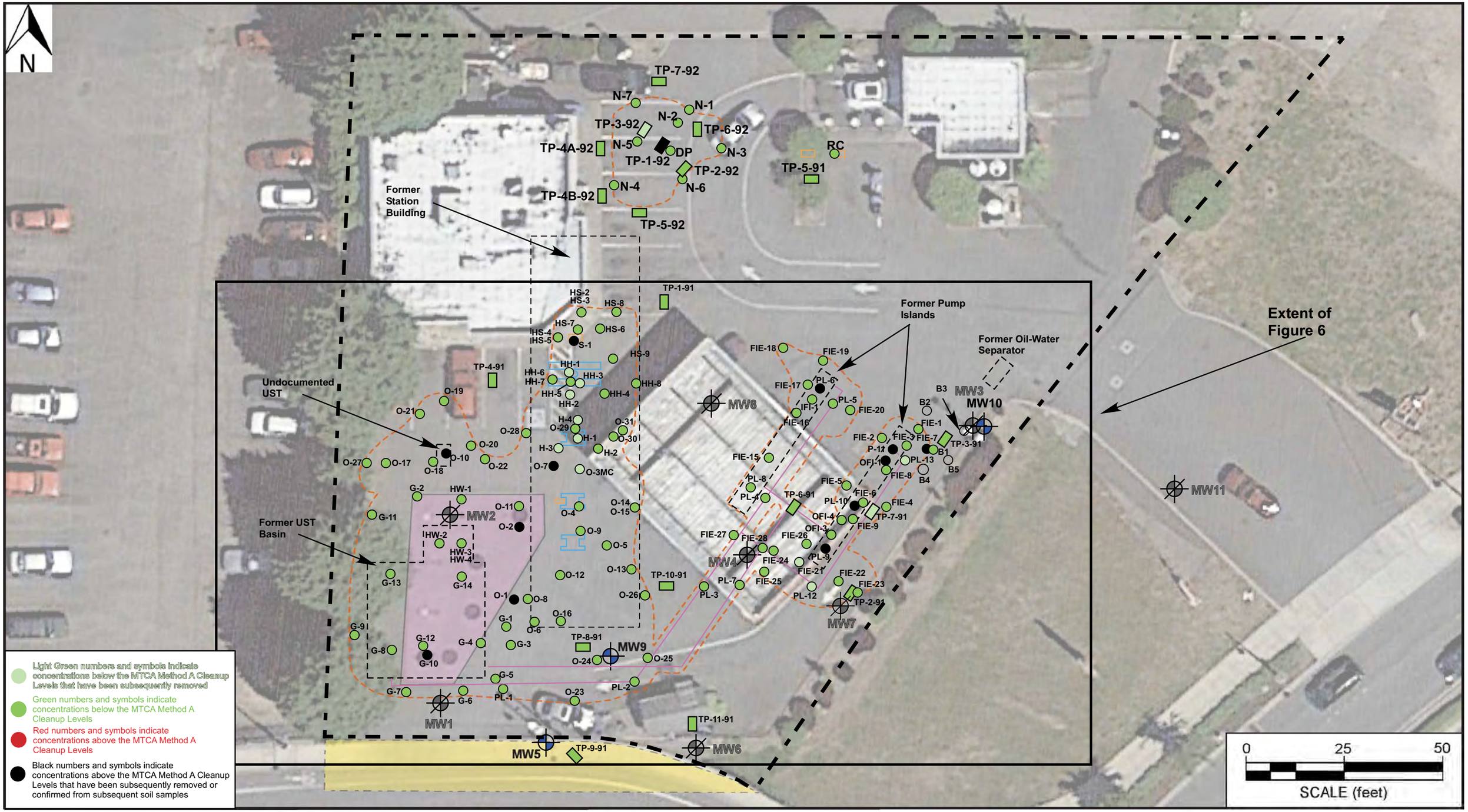
• Figures

Bothell 76, Bothell, Washington



AEROTECH ENVIRONMENTAL CONSULTING	**REGIONAL MAP**	**Bothell 76 (Unocal 5905)** **18015 Bothell Way Northeast** **Bothell, Washington**	**Date:** 02/27/17 **By:** Nick Gerkin **Figure:** 1



Light Green numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels that have been subsequently removed

Green numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels

Red numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels

Black numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels that have been subsequently removed or confirmed from subsequent soil samples

EXPLANATION

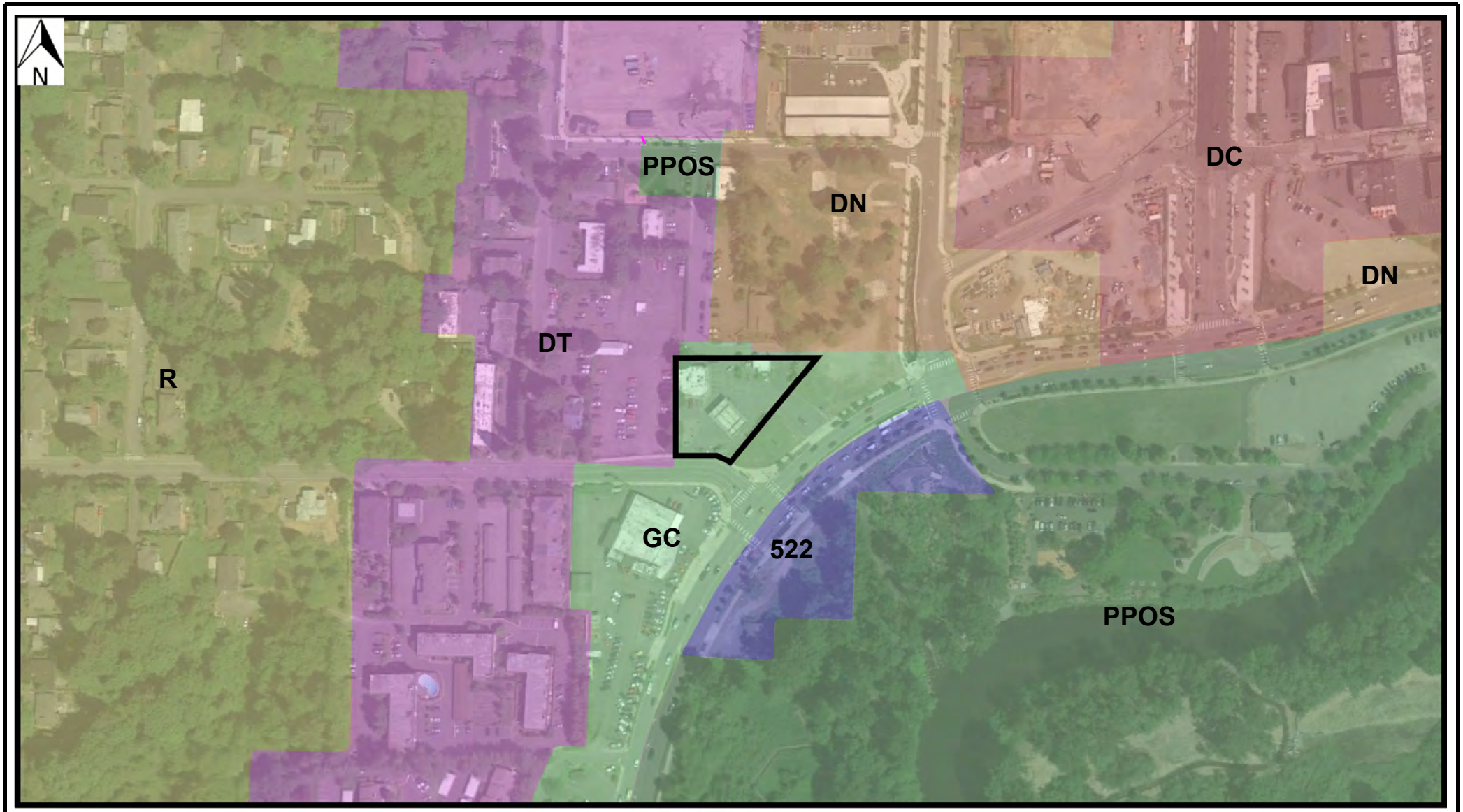
- MW10 — Groundwater Monitoring Well
- MW8 — Destroyed Groundwater Monitoring Well
- O-32 — Soil Sample Location
- B5 — Soil Boring Location
- TP8 — Test Pit Location
- Former Hoist Location
- 1st Generation Fuel Lines
- Sump
- Extent of Excavation
- 1st Generation Service Station Features
- Property Boundary
- Parcel Purchased by City of Bothell in 2013

AEROTECH ENVIRONMENTAL CONSULTING

SITE PLAN
WITH CUMULATIVE SOIL DATA

Bothell 76
18015 Bothell Way Northeast
Bothell, Washington

Date: 01/19/19
By: Nick Gerkin
Figure: 2



EXPLANATION

- Subject Property
- 522 - SR 522 Corridor
- DT - Downtown Transition
- PPOS - Park & Public Open Space
- R - Residential
- DC - Downtown Core
- DN - Downtown Neighborhood
- GC - General Commercial

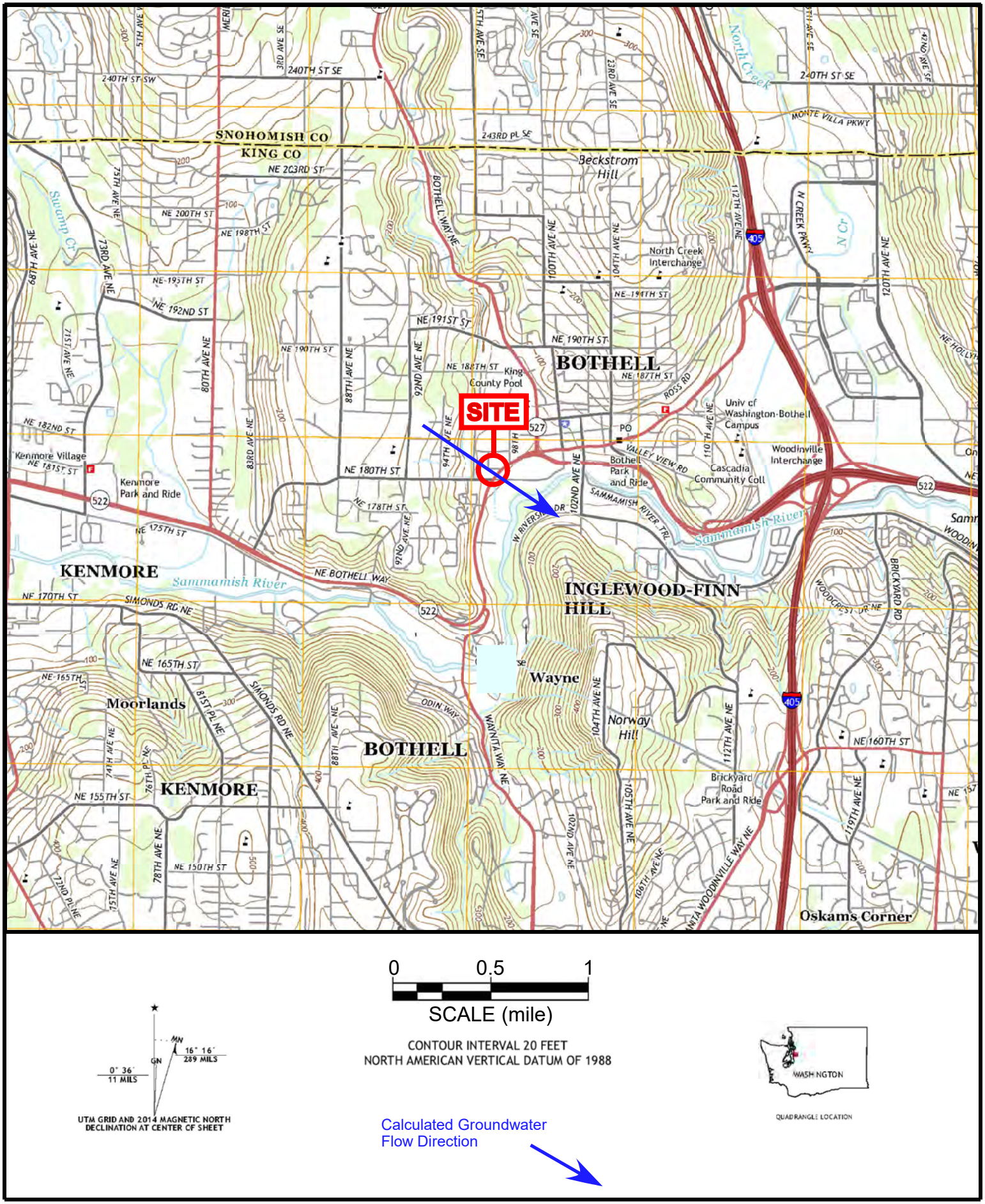
AEROTECH ENVIRONMENTAL CONSULTING

VICINITY ZONING MAP

Bothell 76
18015 Bothell Way Northeast
Bothell, Washington

0 250 500
SCALE (feet)

Date: 10/19/17
By: Nick Gerkin
Figure: 3

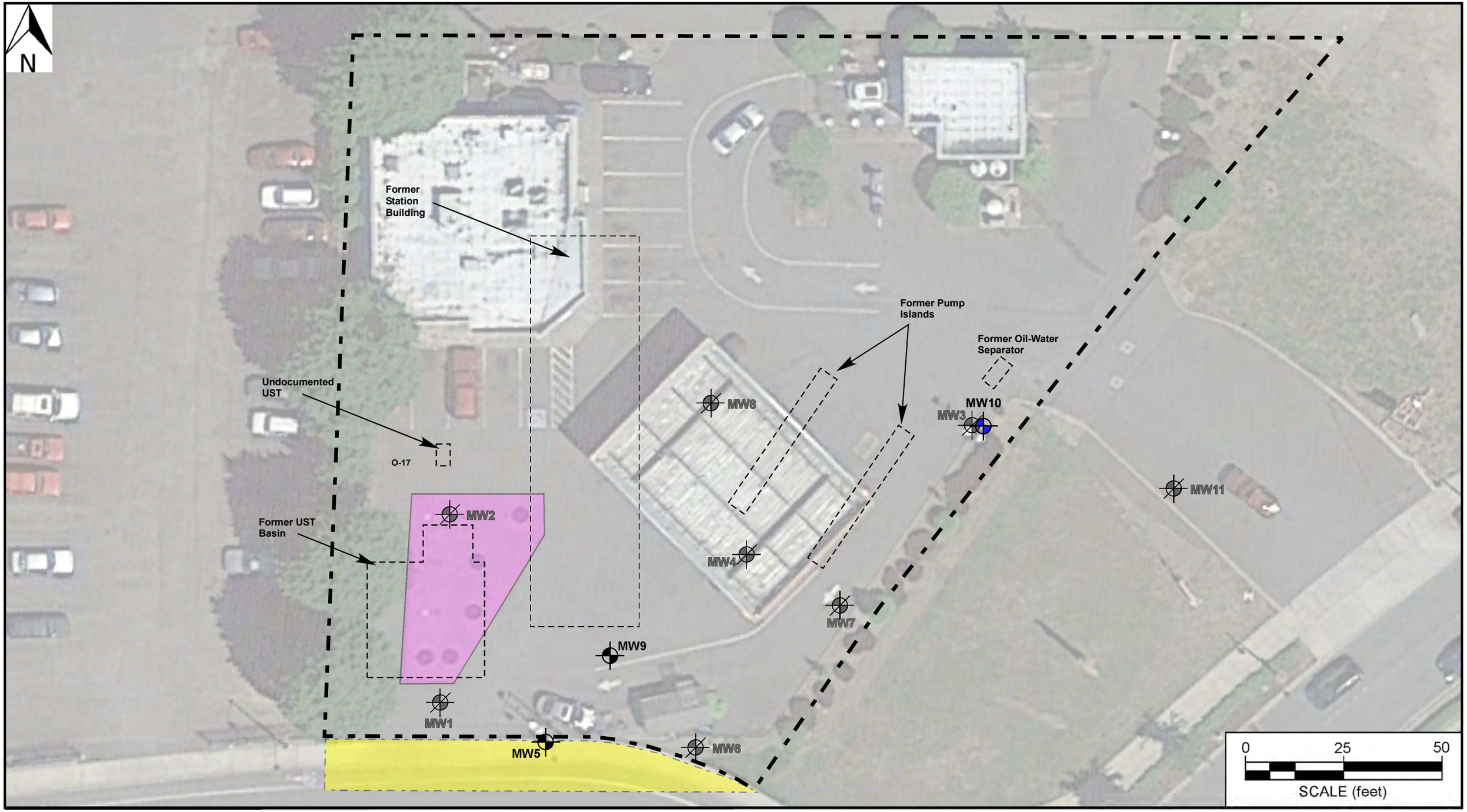


AEROTECH
ENVIRONMENTAL CONSULTING

USGS TOPOGRAPHIC MAP

Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

Date: 10/23/17
By: Nick Gerkin
Figure: 4



EXPLANATION

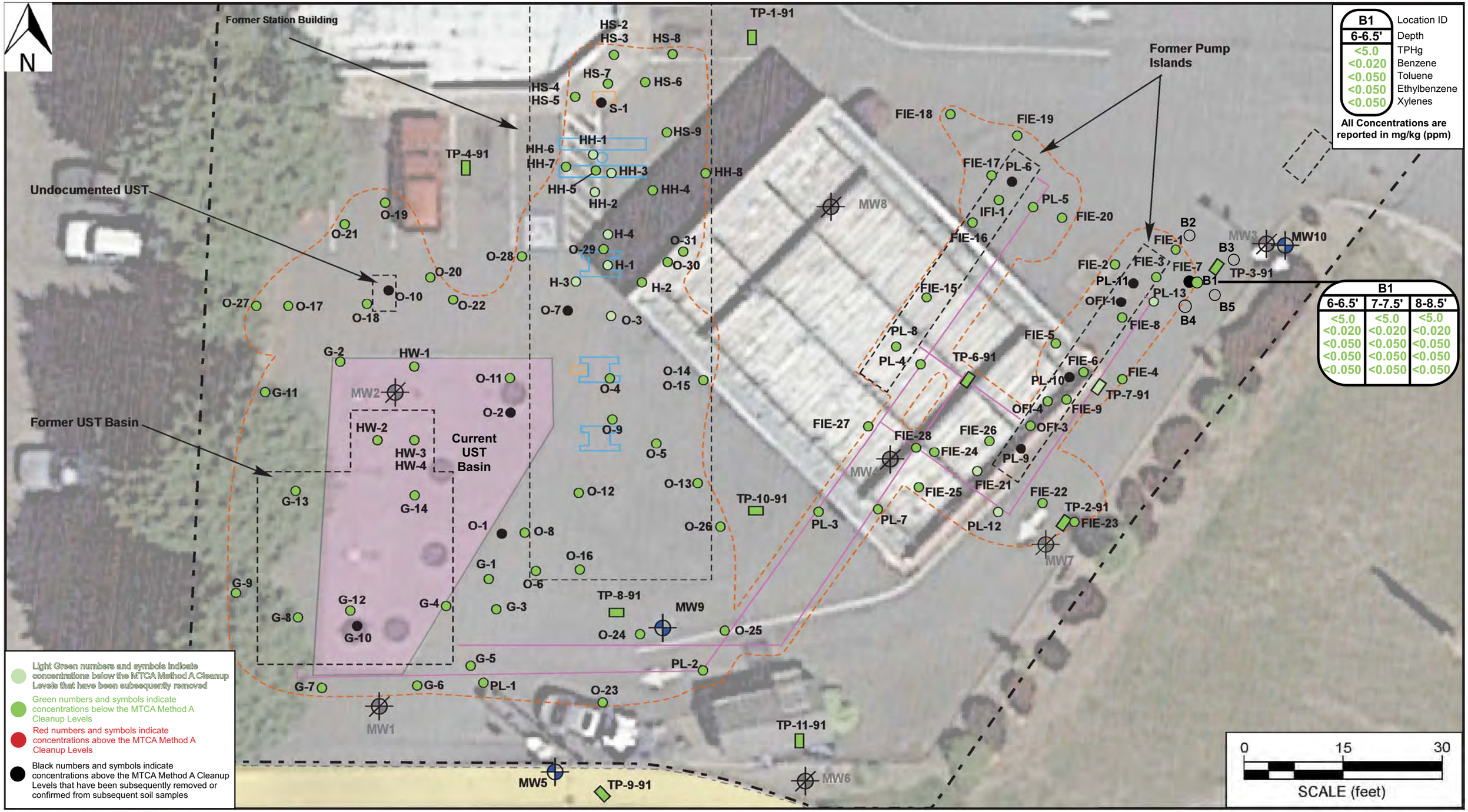
- MW10 — Groundwater Monitoring Well
- MW8 — Destroyed Groundwater Monitoring Well
- Parcel Purchased by City of Bothell in 2013
- Extent of Excavation
- 1st Generation Service Station Features
- Property Boundary

AEROTECH ENVIRONMENTAL CONSULTING

GROUNDWATER MONITORING WELL LOCATIONS MAP

Bothell 76
18015 Bothell Way Northeast
Bothell, Washington

Date: 10/19/17
By: Nick Gerkin
Figure: 5



B1	Location ID
6-6.5'	Depth
<5.0	TPHg
<0.020	Benzene
<0.050	Toluene
<0.050	Ethylbenzene
<0.050	Xylenes

All Concentrations are reported in mg/kg (ppm)

B1		
6-6.5'	7-7.5'	8-8.5'
<5.0	<5.0	<5.0
<0.020	<0.020	<0.020
<0.050	<0.050	<0.050
<0.050	<0.050	<0.050
<0.050	<0.050	<0.050

Light Green numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels that have been subsequently removed

Green numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels

Red numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels

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EXPLANATION

- MW10 — Groundwater Monitoring Well
- MW8 — Destroyed Groundwater Monitoring Well
- O-32 — Soil Sample Location
- B5 — Soil Boring Location
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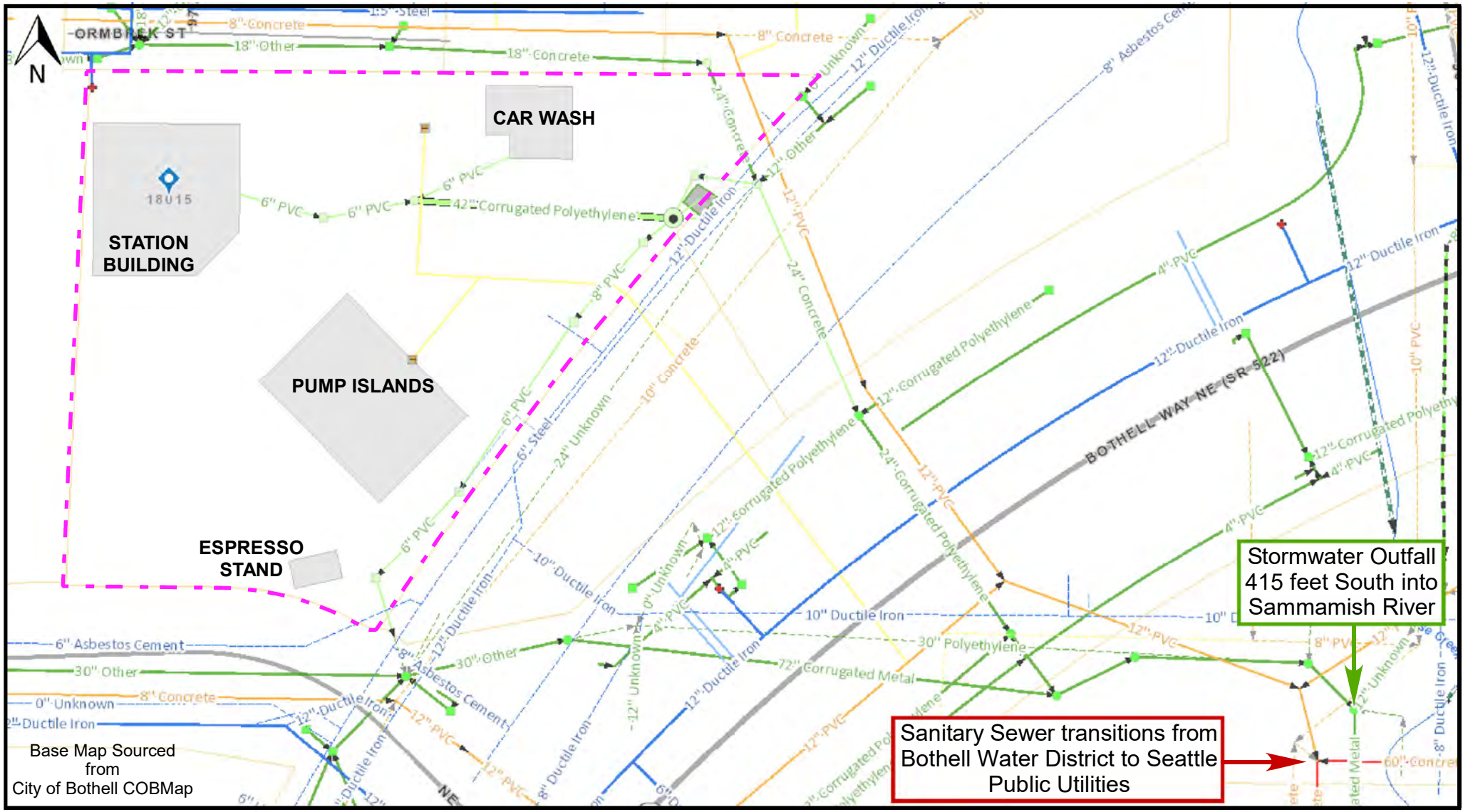
- 1st Generation Fuel Lines
- Sump
- Extent of Excavation
- 1st Generation Service Station Features
- Property Boundary
- Parcel Purchased by City of Bothell in 2013

AEROTECH ENVIRONMENTAL CONSULTING

CUMULATIVE SOIL ANALYTICAL RESULTS MAP - GAS AREA

Bothell 76
18015 Bothell Way Northeast
Bothell, Washington

Date: 01/19/19
By: Nick Gerkin
Figure: 6



EXPLANATION

Subject Site	Fire Hydrant	Property Boundary	Seattle Public Utilities Sewer
Oil Water Separator	Catch Basin	Alderwood Water & Wastewater District	City of Bothell Sewer
		Storm Pipe	Sewer Lateral

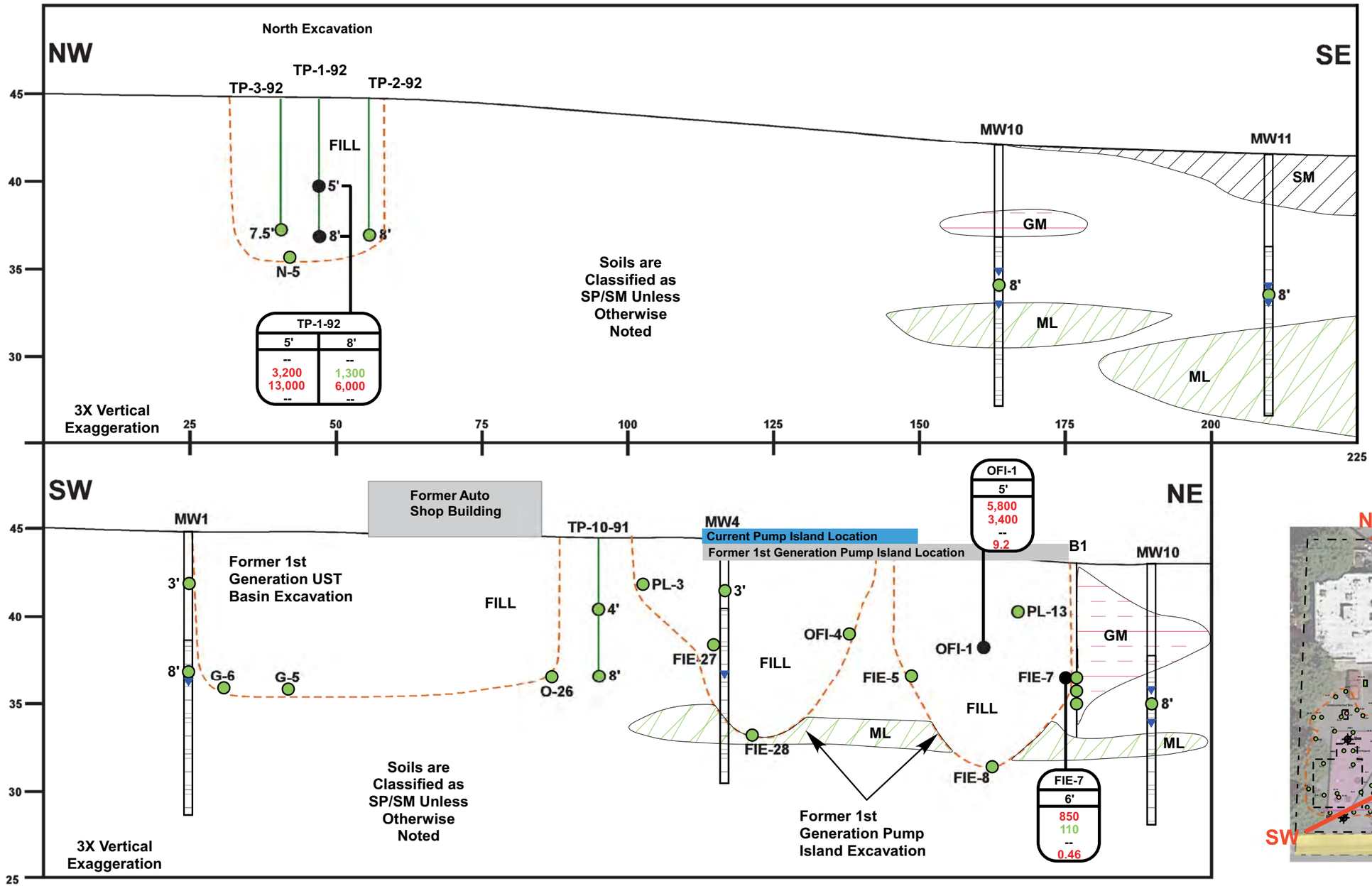
AEROTECH ENVIRONMENTAL CONSULTING

UTILITY LOCATIONS

Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

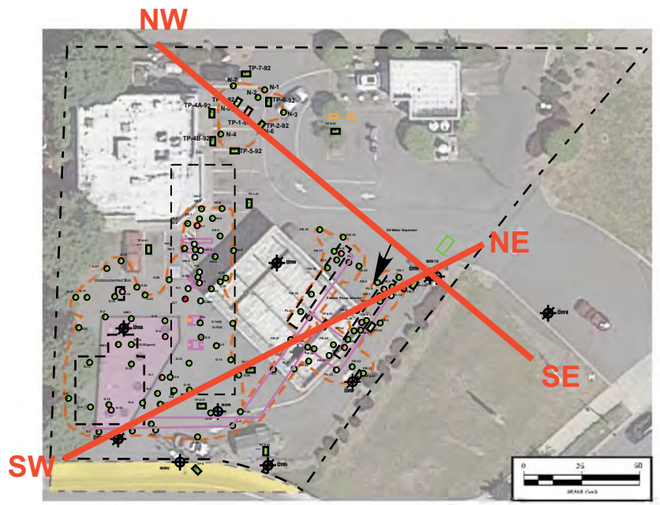
0 50 100
SCALE (feet)

Date: 10/18/17
By: Nick Gerkin
Drawing: 7



OFI-1	Location ID
5'	Depth
5,800	TPHg
3,400	TPHd
--	TPHo
9.2	Benzene

All Concentrations are reported in mg/kg (ppm)



AEROTECH ENVIRONMENTAL CONSULTING

EXPLANATION

- Green numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels
- Red numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels
- Black numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels that have been subsequently removed or confirmed

O-32 Soil Sample Location

Historical Water Level

Screened Interval

Extent of Excavation

Test Pit

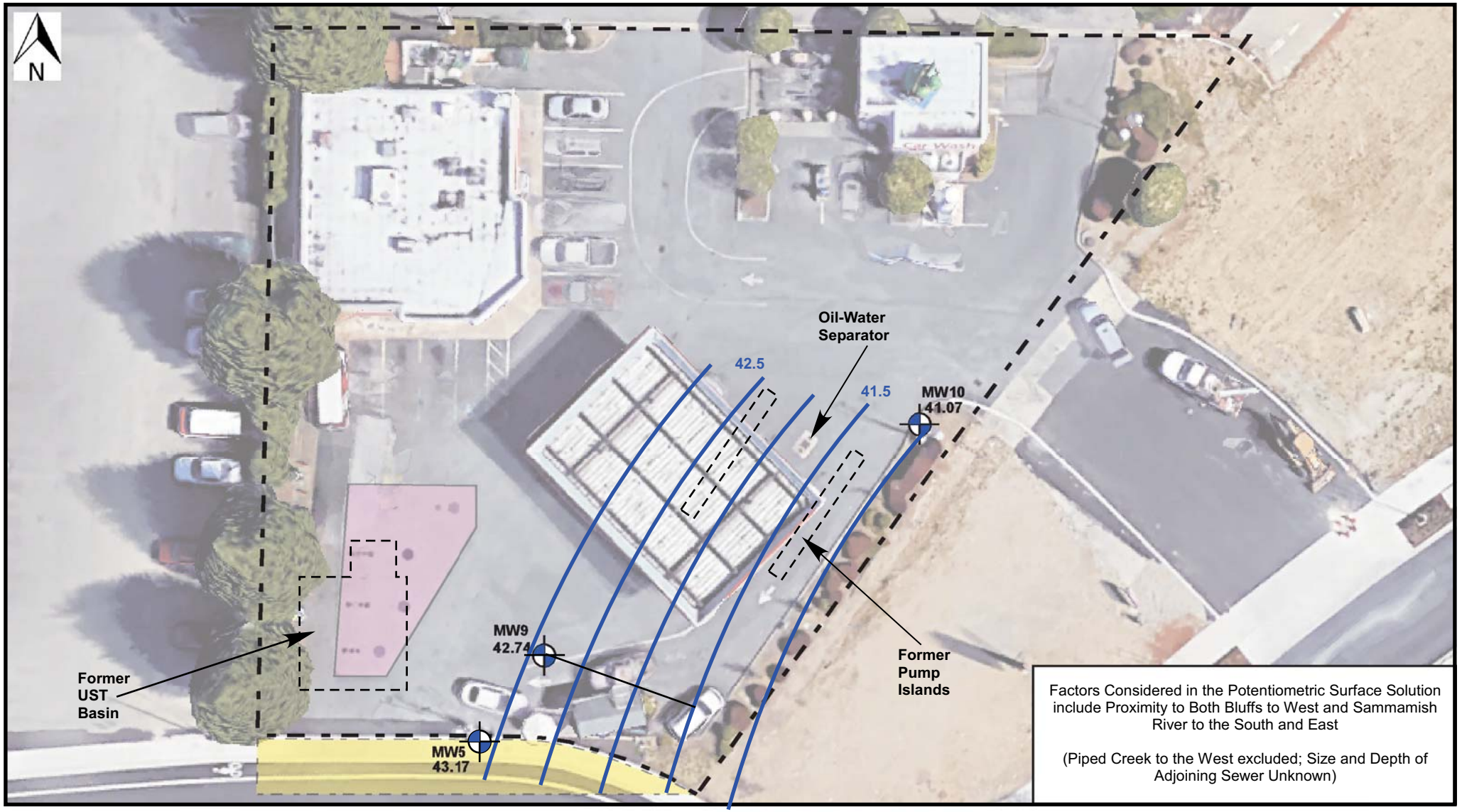
CROSS SECTIONS

Bothell 76
18015 Bothell Way Northeast
Bothell, Washington

Date: 01/28/19

By: Nick Gerkin

Figure: 8



EXPLANATION

Blue numbers and symbols indicate concentrations below the MTCA Method A Cleanup Levels

Red numbers and symbols indicate concentrations above the MTCA Method A Cleanup Levels

MW10
30.77

Groundwater Monitoring Well

Groundwater Elevation (Feet Above MSL)

Groundwater Elevation Contour Line

Parcel Purchased by City of Bothell in 2013

Current UST Basin

Calculated Groundwater Flow Direction and Gradient:

Southeast 0.03 ft/ft

AEROTECH ENVIRONMENTAL CONSULTING

GROUNDWATER POTENTIOMETRIC SURFACE MAP - 03/01/18

Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

0 35 70
SCALE (feet)

Date: 06/15/18
By: Justin Foslien
Drawing: 9

• Tables

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS

Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

GeoEngineers - Report of Geotechnical Services Subsurface Contamination Study - January 24, 1990

Sample ID	Soil Boring/Point Well ID	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MW-1	MW-1	MW-1	11/09/89	3	<1	--	--	--	<0.025	<0.025	<0.025	<0.025	--	--	--
MW-1	MW-1	MW-1	11/09/89	8	<1	--	--	--	<0.025	<0.025	<0.025	<0.025	--	--	--
MW-2	MW-2	MW-2	11/09/89	3	<1	--	--	--	<0.025	<0.025	<0.025	<0.025	--	--	--
MW-3	MW-3	MW-3	11/09/89	3	37	--	--	--	<0.025	<0.025	<0.025	<0.025	--	--	--
MW-4	MW-4	MW-4	11/09/89	3	<1	--	--	--	<0.025	<0.025	<0.025	<0.025	--	--	--

GeoEngineers - Report of Geoenvironmental Services Underground Storage Tank Removal and Remediation Excavation Activites - May 15, 1992

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Hydraulic Hoist Excacation															
H-1	Base	H-1	02/26/91	3	32	<5	<5	--	--	--	--	--			--
H-2	East wall	H-2	02/26/91	8	98	<5	<5	--	--	--	--	--			--
H-3	West wall	H-3	02/26/91	3	120	<5	<5	--	--	--	--	--			--
H-4	North wall	H-4	02/26/91	3	35	<5	<5		--	--	--	--			--
Main Excavation															
G-1	Tank Excavation east wall	G-1	05/14/91	7	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-2	Tank Excavation north wall	G-2	05/16/91	8	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-3	Tank Excavation east wall	G-3	05/17/91	8	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-4	Tank Excavation base	G-4	05/17/91	11	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-5	Tank Excavation east wall	G-5	05/17/91	9	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-6	Tank Excavation south wall	G-6	05/17/91	9	--	4.5	<20	--	<0.05	0.07	<0.05	0.10	--	--	--
G-7	Tank Excavation south wall	G-7	05/17/91	9	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-8	Tank Excavation base	G-8	05/17/91	11	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-9	Tank Excavation west wall	G-9	05/17/91	9	--	<1.0	<20	--	<0.05	<0.05	<0.05	<0.05	--	--	--
G-10*	Tank Excavation base	G-10	05/17/91	11	--	**170**	53	--	**0.14**	1.7	4.6	**12**	--	--	--
HW-1	Tank Excavation north wall	HW-1	05/16/91	7	<10.0	--	<10.0	--	--	--	--	--	--	--	--
HW-2	Tank Excavation base	HW-2	05/16/91	10	<10.0	--	<10.0	--	--	--	--	--	--	--	--
HW-3	Tank Excavation base	HW-3	05/16/91	10	<10.0	--	<10.0	--	--	--	--	--	ND	--	--
O-1*	Tank Excavation east wall	O-1	05/16/91	8	**2,600**	--	1,500	--	--	--	--	--	ND	--	--
O-2*	Tank Excavation east wall	O-2	05/16/91	8	**3,100**	--	**2,400**	--	--	--	--	--	ND	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS

Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

GeoEngineers - Report of Geoenvironmental Services Underground Storage Tank Removal and Remediation Excavation Activites - May 15, 1992 - Continued

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Product Line Excavation and Service Island Areas															
PL-1	Product Lines	PL-1	05/08/91	2	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-2	Product Lines	PL-2	05/08/91	2	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-3	Product Lines	PL-3	05/09/91	2.5	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-4	Product Lines	PL-4	05/09/91	2.5	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-5	Product Lines	PL-5	05/09/91	2.5	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-6*	Inboard Island	PL-6	05/14/91	4	--	**15,000**	**14,000**	--	**0.54**	**180**	**440**	**1,900**	--	--	<2.2
PL-7	Product Lines	PL-7	05/15/91	2	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-8	Inboard Island	PL-8	05/15/91	2.5	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-9*	Inboard Island	PL-9	05/15/91	3	--	**2,200**	**2,200**	--	<0.05	0.13	0.24	**57**	--	--	--
PL-10*	Inboard Island	PL-10	05/15/91	3	--	**2,700**	**3,200**	--	<0.05	3.0	4.9	**60**	--	--	--
PL-11*	Inboard Island	PL-11	05/15/91	3	--	**20,000**	**9,600**	--	**17**	**140**	**370**	**840**	--	--	--
PL-12	Product Lines	PL-12	05/16/91	2	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
PL-13	Product Lines	PL-13	05/16/91	3	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
IFI-1	Northwest Canopy Footing	IFI-1	05/22/91	5	--	<1.0	<10.0	--	<0.05	<0.05	<0.05	<0.05	--	--	--
OFI-1*	Northeast Canopy Footing	OFI-1	05/22/91	5	--	**5,800**	**3,400**	--	**9.2**	**180**	**260**	**550**	--	--	--
OFI-2	Southeast Canopy Footing	OFI-2	05/22/91	5	--	<1.0	<10.0	--	<0.05	0.66	<0.05	0.73	--	--	--
OFI-3	Southeast Canopy Footing	OFI-3	05/22/91	5	--	<1.0	<10.0	--	<0.05	0.09	0.05	<0.05	--	--	--
Test Pit Explorations															
TP-1	Test Pit 1	TP-1-91	05/14/91	8	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-2	Test Pit 2	TP-2-91	05/14/91	8	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-3	Test Pit 3	TP-3-91	05/14/91	9	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-4A	Test Pit 4	TP-4A-91	05/15/91	7	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-4B	Test Pit 4	TP-4B-91	05/15/91	2.5	30	--	<10	--	--	--	--	--	--	--	--
TP-5	Test Pit 5	TP-5-91	05/15/91	7.5	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-6-1	Test Pit 6	TP-6-91	05/16/91	2	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-6-2	Test Pit 6	TP-6-91	05/16/91	7.5	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-7	Test Pit 7	TP-7-91	05/21/91	7.5	--	<1	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-8-4.5	Test Pit 8	TP-8-91	05/21/91	4.5	21	--	<10	--	--	--	--	--	--	--	--
TP-8-9	Test Pit 8	TP-8-91	05/21/91	9	1,200	--	1,800	--	--	--	--	--	--	--	--
TP-9-8	Test Pit 9	TP-9-91	05/21/91	8	13	--	<10	--	<0.05	<0.05	<0.05	<0.05	--	--	--
TP-10-4	Test Pit 10	TP-10-91	05/21/91	4	28	--	<10	--	--	--	--	--	--	--	--
TP-10-8	Test Pit 10	TP-10-91	05/21/91	8	19	--	<10	--	--	--	--	--	--	--	--
TP-11-8	Test Pit 11	TP-11-91	05/21/91	8	18	--	<10	--	--	--	--	--	--	--	--
TP-11-10	Test Pit 11	TP-11-91	05/21/91	10	20	--	<10	--	--	--	--	--	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS

Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

GeoEngineers - Report of Geoenvironmental Services Underground Storage Tank Removal and Remediation Excavation Activites - May 15, 1992 - Continued

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Main Excavation															
G-11	West wall	G-11	09/30/91	7.5	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	<5.0
G-12	Base, beneath center gasoline UST	G-12	10/01/91	13	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	--
G-13	Base, beneath western gasoline UST	G-13	10/02/91	12	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	--
G-14	Base, beneath eastern gasoline UST	G-14	10/04/91	11.5	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	--
HW-4	Base, beneath waste oil UST	HW-4	10/02/91	11	--			--	--	--	--	--	0.13B - MC	--	--
O-3	North wall	O-3	10/02/91	4	--	<5	<5	13	<0.025	<0.025	<0.025	<0.025	0.26B - MC	--	--
O-4	Base, beneath building	O-4	10/02/91	10	--	--	--	5	--	--	--	--	--	--	--
O-5	Base, beneath buiding	O-5	10/02/91	10	--	--	--	5	--	--	--	--	--	--	--
O-6	Base, beneath buiding	O-6	10/02/91	11	--	--	--	5	--	--	--	--	--	--	--
O-7*	North wall	O-7	10/02/91	7.5	--	**2,400**	<50	**2,300**	<0.13	<0.13	1.1	5.0	--	--	--
O-8	Base, beneath building	O-8	10/02/91	11	--	--	--	5	--	--	--	--	--	--	--
O-9	Base, beneath building	O-9	10/03/91	10.5	--	--	--	34	--	--	--	--	--	--	--
O-10*	Beneath undocumented UST	O-10	10/04/91	6	--	**1,200**	**18,000**	**14,000**	--	--	--	--	--	--	--
O-11	Base, beneath building	O-11	10/04/91	11	--	--	--	44	--	--	--	--	--	--	--
O-12	Base, beneath building	O-12	10/08/91	11	--	--	--	<5	--	--	--	--	--	--	--
O-13	East wall	O-13	10/08/91	9	--	--	--	<5	--	--	--	--	--	--	--
O-14	East wall	O-14	10/08/91	9	--	<5	<5	<5	--	--	--	--	--	--	--
O-15	East wall	O-15	10/08/91	8	--	--	--	<5	--	--	--	--	--	--	--
O-16	South wall	O-16	10/08/91	9	--	--	--	59	--	--	--	--	--	--	--
O-17	West wall, undocumented UST area	O-17	10/09/91	7	--	--	--	260	--	--	--	--	--	--	--
O-18	Base, beneath undocumented UST	O-18	10/09/91	10	--	--	--	130	--	--	--	--	--	--	--
O-19	North wall, undocumented UST area	O-19	10/10/91	8	--	--	--	<5	--	--	--	--	--	--	--
O-20	North wall, undocumented UST area	O-20	10/10/91	8	--	--	--	<5	--	--	--	--	--	--	--
O-21	North wall, undocumented UST area	O-21	10/10/91	3	--	--	--	15	--	--	--	--	--	--	--
O-22	North wall, undocumented UST area	O-22	10/10/91	3	--	<5	<5	<5	--	--	--	--	--	--	--
Hoist Excavation and Sump Excavation															
S-1*B192	Base, sump excavation	S-1	10/07/91	5	--	**41**	310	570	--	--	--	--	--	ND	--
HH-1	Base, hoist excavation	HH-1	10/07/91	7	--	--	--	590	--	--	--	--	--	--	--
HH-2	Base, hoist excavation	HH-2	10/07/91	7	--	--	--	76	--	--	--	--	--	--	--
HH-3	Base, hoist excavation	HH-3	10/07/91	7	--	<5	57	250	--	--	--	--	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS

Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

GeoEngineers - Report of Geoenvironmental Services Underground Storage Tank Removal and Remediation Excavation Activites - May 15, 1992 - Continued

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Central Service Island Excavation															
FIE-1	North wall	FIE-1	09/30/91	12	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	<5.0
FIE-2	West wall	FIE-2	09/30/91	11	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	--
FIE-3	Base	FIE-3	09/30/91	15	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	<5.0
FIE-4	East wall	FIE-4	10/01/91	6	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	--
FIE-5	West wall	FIE-5	10/01/91	7	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	--
FIE-6	Base	FIE-6	10/01/91	10	--	<5	<5	--	<0.025	<0.025	<0.025	<0.025	--	--	<5.0
FIE-7^	East wall	FIE-7	10/01/91	6	--	**850**	110	--	**0.46**	**22**	**29**	**160**	--	--	--
FIE-8	Base	FIE-8	10/03/91	12	--	<5	<28	--	<0.025	<0.025	<0.025	<0.025	--	--	<5.0
FIE-9	South wall	FIE-9	10/03/91	9	--	<5	<32	--	<0.025	<0.025	<0.025	<0.025	--	--	--
Main Excavation															
O-23	South wall	O-23	02/11/92	11	--	<5	<25	<20	--	--	--	--	--	--	--
O-24	Base	O-24	02/11/92	12	--	<5	<25	<20	--	--	--	--	--	--	--
O-25	East wall	O-25	02/11/92	10	--	<5	<25	<20	--	--	--	--	--	--	--
O-26	East wall	O-26	02/11/92	8	--	<5	<25	<20	--	--	--	--	--	--	--
O-27	West wall, undocumented UST area	O-27	02/12/92	7	--	<5	<25	<20	--	--	--	--	--	--	--
O-28	West wall, beneath building	O-28	02/12/92	7	--	<5	<25	<20	--	--	--	--	--	--	
O-29	Base, beneath building	O-29	02/12/92	11	--	<5	<25	<20	--	--	--	--	--	--	--
O-30	East wall, beneath building	O-30	02/12/92	9	--	<5	<25	<20	--	--	--	--	--	--	--
O-31	East wall, beneath building	O-31	02/13/92	4	--	<5	<25	<20	--	--	--	--	--	--	--
HH-4	East wall, hoist area	HH-4	02/12/92	8	--	<5	<25	<20	--	--	--	--	--	--	--
HH-5	Base, hoist area	HH-5	02/13/92	10	--	<5	<25	34	--	--	--	--	--	--	--
HH-6	West wall, hoist area	HH-6	02/13/92	9	--	<5	<25	<20	--	--	--	--	--	--	--
HH-7	West wall, hoist area	HH-7	02/13/92	4	--	<5	<25	<20	--	--	--	--	--	--	--
HH-8	East wall, hoist area	HH-8	02/17/92	1	--	<5	<25	22	<0.029	<0.029	<0.029	<0.029	--	--	--
HS-2	North wall, sump area	HS-2	02/13/92	10	--	<5	<25	<20	<0.033	<0.033	<0.033	<0.033	--	--	--
HS-3	North wall, sump area	HS-3	02/13/92	6	--	<5	<25	<20	<0.027	<0.027	<0.027	<0.027	--	--	--
HS-4	West wall, sump area	HS-4	02/13/92	10	--	<5	<25	<20	--	--	--	--	--	--	--
HS-5	West wall, sump area	HS-5	02/13/92	4.5	--	<5	<25	<20	<0.029	<0.029	<0.029	<0.029	--	--	--
HS-6	Base, sump area	HS-6	02/13/92	9	--	<5	<25	<20	--	--	--	--	--	--	--
HS-7	Base, sump area	HS-7	02/13/92	11	--	<5	<25	<20	<0.029	<0.029	<0.029	<0.029	--	ND	--
HS-8	East wall, sump area	HS-8	02/13/92	3	--	<5	<25	<23	<0.029	<0.029	<0.029	<0.029	--	--	--
HS-9	Base, sump area	HS-9	02/14/92	4	--	<5	<25	<20	<0.026	<0.026	<0.026	<0.026	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS

Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

GeoEngineers - Report of Geoenvironmental Services Underground Storage Tank Removal and Remediation Excavation Activites - May 15, 1992 - Continued

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Northern Service Island Excavation															
FIE-15	Beneath former dispenser	FIE-15	02/12/92	3	--	<5	<25	--	<0.027	<0.027	<0.027	<0.027	--	--	--
FIE-16	South wall	FIE-16	02/13/92	8	--	<5	<25	--	<0.031	<0.031	<0.031	<0.031	--	--	--
FIE-17	Base	FIE-17	02/13/92	8	--	<5	<25	--	<0.032	<0.032	<0.032	<0.032	--	--	--
FIE-18	West wall	FIE-18	02/14/92	8	--	<5	<25	--	<0.027	<0.027	<0.027	<0.027	--	--	--
FIE-19	North wall	FIE-19	02/14/92	8	--	<5	<25	--	<0.031	<0.031	<0.031	<0.031	--	--	--
FIE-20	East well	FIE-20	02/14/92	8	--	<5	<25	--	<0.032	<0.032	<0.032	<0.032	--	--	--
Southern Service Island Excavation															
FIE-21	Base	FIE-21	02/14/92	3	--	<5	<25	--	<0.028	<0.028	<0.028	<0.028	--	--	--
FIE-22	Base	FIE-22	02/14/92	5	--	<5	<25	--	<0.026	<0.026	<0.026	<0.026	--	--	--
FIE-23	East wall	FIE-23	02/14/92	3	--	<5	<25	--	<0.027	<0.027	<0.027	<0.027	--	--	--
FIE-24	Base	FIE-24	02/17/92	9	--	67	460	--	<0.032	<0.032	<0.032	<0.032	--	--	--
FIE-25	South wall	FIE-25	02/17/92	6	--	<5	<25	--	<0.027	<0.027	<0.027	<0.027	--	--	--
FIE-26	North wall	FIE-26	02/17/92	7	--	<5	<25	--	<0.031	<0.031	<0.031	<0.031	--	--	--
FIE-27	West wall	FIE-27	02/17/92	6	--	<5	<25	--	<0.031	<0.031	<0.031	<0.031	--	--	--
FIE-28	Base	FIE-28	02/20/92	11	--	<5	<25	--	<0.028	<0.028	<0.028	<0.028	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

GeoEngineers - Report of Geoenvironmental Services Supplemental Subsurface Investigation and Remediation Monitoring Activities - March 1992

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MW-5	MW-5	MW-5	03/19/92	8	--	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-6	MW-6	MW-6	03/19/92	8	--	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-7	MW-7	MW-7	03/19/92	8	--	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-8	MW-8	MW-8	03/19/92	8	--	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-9	MW-9	MW-9	03/20/92	8	--	ND	ND	ND	--	--	--	--	--	--	--
MW-9			03/20/92	10.5	--	ND	ND	ND	ND	ND	ND	ND	--	--	
MW-10	MW-10	MW-10	03/20/92	8	--	ND	ND	ND	ND	ND	ND	ND	--	--	
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

GeoEngineers - Progress Report No.1 Quarterly Ground Water Monitoring and Supplemental Subsurface Investigation Reports - January 20, 1993

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MW11	MW11	MW11	09/28/92	7	--	--	--	100	--	--	--	--	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS
Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

GeoEngineers - Report of Geoenvironmental Services Supplemental Subsurface Investigation and Remediation Monitoring Activities - March 30, 1993

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Drain Pipe	Beneath drain pipe	DP	09/18/92	1.5	--	--	21	110	--	--	--	--	--	--	--
TP-1-5*	Test pit TP-1	TP-1-92	09/18/92	5	--	--	3,200	13,000	--	--	--	--	--	--	--
TP-1-8*	Test pit TP-1	TP-1-92	09/18/92	8	--	--	1,300	6,000	--	--	--	--	--	--	--
TP-2-8	Test pit TP-2	TP-2-92	09/18/92	8	--	--	<14	<43	--	--	--	--	--	--	--
TP-3-7.5	Test pit TP-3	TP-3-92	09/18/92	7.5	--	--	<14	<42	--	--	--	--	--	--	--
TP-4-1	Test pit TP-4	TP-4A-92	09/23/92	8	--	--	<28	<23	--	--	--	--	--	--	--
TP-4-2	Test pit TP-4	TP-4B-92	09/23/92	8	--	--	<29	<23	--	--	--	--	--	--	--
TP-5-1	Test pit TP-5	TP-5-92	09/23/92	8	--	--	<27	39	--	--	--	--	--	--	--
TP-6-1	Test pit TP-6	TP-6-92	09/23/92	8	--	--	<28	<22	--	--	--	--	--	--	--
TP-7-1	Test pit TP-7	TP-7-92	09/23/92	8	--	--	<32	<25	--	--	--	--	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

GeoEngineers - Report of Geoenvironmental Services Supplemental Subsurface Investigation and Remediation Monitoring Activities - March 30, 1993 - Continued

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Sump Excavation															
Reclamation Pit	Base	RC	09/28/92	7	--	--	--	100	--	--	--	--	--	--	--
North Excavation															
N-1	North wall	N-1	12/03/92	7.5	--	--	<29	<23	--	--	--	--	--	--	--
N-2	Base	N-2	12/03/92	9	--	--	<29	<24	--	--	--	--	--	--	--
N-3	East wall	N-3	12/03/92	8	--	--	<30	<24	--	--	--	--	--	--	--
N-4	West wall	N-4	12/04/92	8	--	--	<28	<22	--	--	--	--	--	--	--
N-5	Base	N-5	12/04/92	9	--	--	<29	<24	--	--	--	--	--	--	--
N-6	South wall	N-6	12/04/92	8	--	--	<30	<24	--	--	--	--	--	--	--
N-7	West wall	N-7	12/04/92	8	--	--	<28	<22	--	--	--	--	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

TABLE 1
CUMULATIVE SOIL ANALYTICAL RESULTS

Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

Aerotech - Remedial Invsetigation Report - January 31, 2019

Sample ID	Soil Boring/Point Well ID/Location	Map Location ID	Sampling Date	Sample Depth	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	HVOCs	PCBs	Lead
				Feet BGS		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
B1(6-6.5)	B1	B1	01/22/19	6-6.5	--	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
B1(6-6.5)DUP	B1	B1	01/22/19	6-6.5	--	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
B1(7-7.5)	B1	B1	01/04/19	7-7.5	--	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
B1(8-8.5)	B1	B1	01/04/19	8-8.5	--	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
MTCA Method A Cleanup Levels					--	30	2,000	2,000	0.03	7	6	6			250

MTCA = Model Toxic Control Act Cleanup Level (WAC173-340-900)
BGS = Below Ground Surface mg/kg = milligram of analyte per kilogram of soil
< = not detected at indicated Laboratory Detection Limits -- = not analyzed
Benzene , Toluene, Ethylbenzene, Xylenes by EPA Method 8021B/8020
TPH - Total Petroleum Hydrocarbons - by EPA Method 418.1
TPHg - Total Petroleum Hydrocarbons - Gasoline by NWTPH-Gx/8020
TPHd - Total Petroleum Hydrocarbons - Diesel by NWTPH-Dx/8015 Modified
TPHo - Total Petroleum Hydrocarbons - Motor Oil by NWTPH-Dx extended/EPA Method 418.1 Modified

HVOCs - Halogenated Volatile Organic Compounds by EPA Method 8010
PCBs - Polychlorinated Biphenyls by EPA Method 8080
Lead by EPA Method 7010/7471
ND = Not Detected; mulitiple detection limits, see laboratory reports for specific detection limits
B = Also deteceted in method blank. MC = Methylene Chloride, is a comon laboratory contaminant.
Bolded numbers and red-shaded cells denote concentrations above the MTCA Method A Cleanup Levels for soil
* = Soil from which this sample originated was removed during the Remedial Excavation
^ = This sample has been subsequently confirmed to be below MTCA Method A Cleanup Levels by sample B1(6-6.5)

TABLE 2
CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

MW1

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
16.57	11/16/1989	--	102.49	--	**1,000**	--	--	--	**120**	47	110	610	--	--	--	--	--	--	--
	1/2/1990	8.87	102.49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4/23/1991	--	102.49	--	<1000	<1000	<1000	--	3.0	1.3	6.7	29	--	--	--	--	--	--	--
Well Destroyed During Excavation Activity																			
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW2

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
17.24	11/16/1989	NM	101.73	--	<50	--	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--	ND	--	--	--
	1/2/1990	6.76	101.73	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	4/23/1991	NM	101.73	--	<1000	<1000	<1000	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
Well Destroyed During Excavation Activity																			
		MTCA Method A Cleanup Levels				800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW3

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
17.23	11/16/1989	--	99.22	--	<50	--	--	--	<0.5	<0.5	<0.5	1.0	--	--	--	--	--	--	--
	1/2/1989	--	99.22	--				--			--	--	--	--	--	--	--	--	--
	4/23/1991	--	99.22	--	<1000	<1000	<1000	--	**17**	21	2.4	29	--	--	--	--	--	--	--
	6/9/1992	--	99.22	--	--	<50	<500	--	3.2	0.66	<0.50	1.1	--	--	--	--	--	<1.0	--
	9/1/1992	--	99.22	--	--	<50	<500	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
Well abandoned 9/10/92																			
		MTCA Method A Cleanup Levels				800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW4

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
14.13	11/16/1989	--	100.74	--	<50	--	--	--	<0.5	1.2	<0.5	<0.5	--	--	--	--	--	--	--
	1/2/1990	7.99	100.74	--		--	--	--					--	--	--	--	--	--	--
	4/23/1991	--	100.74	--	<1000	<1000	<1000	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
Well Destroyed During Excavation Activity																			
		MTCA Method A Cleanup Levels				800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

TABLE 2
CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

MW5

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
	3/23/1992	8.20	102.18	--	--	400	<500	--	<0.5	<0.5	<0.5	2.5	--	--	--	--	--	--	--
	4/20/1992	NM	102.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.0	**76**
	6/9/1992	7.85	102.18	--	--	240	<500	--	<0.50	1.0	<0.50	<0.5	--	--	--	--	--	<1.0	--
	9/1/1992	9.23	102.18	--	--	120	<250	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
	12/3/1992	8.82	102.18	--	--	<50	300	<380	<0.50	2.30	<0.50	3.50	--	--	--	--	--	--	--
	3/19/1993	9.57	102.18	--	--	<50	280	**1,500**	<0.50	<0.50	0.95	<0.50	--	--	--	--	--	--	--
	6/16/1993	8.42	102.18	--	--	<10	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	9/22/1993	9.02	102.18	--	--	--	<250	<750	--	--	--	--	--	--	--	--	--	--	--
	1/12/1994	8.77	102.18	--	--	--	<250	<750	--	--	--	--	--	--	--	--	--	--	--
	3/30/1994	8.43	102.18	--	--	140	<250	<750	**23**	6.6	<0.50	0.60	--	--	--	--	--	--	--
	4/13/1994	NM	102.18	--	--	290	<250	<750	**220**	**60**	<0.50	11.00	--	--	--	--	--	<3.0	4.9
	6/21/1994	8.75	102.18	--	--	<10	<250	<750	**26**	0.60	<0.50	<0.50	--	--	--	--	--	--	--
	9/30/1994	9.17	102.18	--	--	170	<250	<750	**29**	<0.50	<0.50	<1.0	--	--	--	--	--	--	--
	12/29/1994	8.55	102.18	--	--	100	<250	**800**	**7**	<0.50	<0.50	<1.0	--	--	--	--	--	--	--
12.4	2/14/2017	8.74	43.17	34.43	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	<2.0	<2.0
	6/1/2017	8.67	43.17	34.50	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	ND	<0.1	--	<2.0
	9/6/2017	10.63	43.17	32.54	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
	12/6/2017	9.48	43.17	33.69	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
	3/1/2018	8.84	43.17	34.33	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW6

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
	3/23/1992	7.49	100.33	3.58	--	<100	<500	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	5.1
	4/20/1992	NM	100.33	NM	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.0	**120**
	6/9/1992	8.14	100.33	2.93	--	<50	<500	--	<0.50	<0.50	<0.50	<0.5	--	--	--	--	--	<1.0	--
	9/1/1992	8.64	100.33	2.43	--	<50	<250	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	2.2	--
DUP	9/1/1992	8.64	100.33	2.43	--	<50	--	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--
	12/3/1992	8.31	100.33	2.76	--	<50	120	<0.38	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	<2.0	--
DUP	12/3/1992	8.31	100.33		--	<50	--	--	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
		Well Destroyed																	
		MTCA Method A Cleanup Levels				800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

TABLE 2
CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

MW7

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
	3/23/1992	--	99.57	--	--	<100	<500	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
	4/20/1992	--	99.57	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.0	**220**
	6/9/1992	--	99.57	--	--	<50	<500	--	<0.50	<0.50	<0.50	<0.5	--	--	--	--	--	<1.0	--
	9/1/1992	--	99.57	--	--	<50	<310	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
Well abandoned 9/10/92																			
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW8

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
	3/23/1992	--	101.18	--	--	<100	<500	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
	4/20/1992	--	101.18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.0	**180**
	6/9/1992	--	101.18	--	--	<50	<500	--	<0.50	<0.50	<0.50	<0.5	--	--	--	--	--	<1.0	--
	9/1/1992	--	101.18	--	--	<50	<250	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
Well abandoned 9/10/92																			
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW9

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
	3/23/1992	7.13	101.26	--	--	<100	**880**	<1000	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	**96**
	4/20/1992	NM	101.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.0	**190**
	6/9/1992	7.91	101.26	--	--	<50	<500	**8,500**	0.56	0.95	<0.50	1.20	--	--	--	--	--	<1.0	--
	7/15/1992	NM	101.26	--	--	--	<500	<500	--	--	--	--	--	--	--	--	--	--	--
	9/1/1992	8.65	101.26	--	--	<50	460	<500	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
	12/3/1992	NM	101.26	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--
	3/9/1993	8.12	101.26	--	--	<50	390	**1,700**	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--		--
	6/16/1993	7.46	101.26	--	--	<100	310	**1,100**	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--		--
DUP	6/16/1993	7.46	101.26	--	--	<100	--	--	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--		--
	9/22/1993	8.35	101.26	--	--	--	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--		--
	1/12/1994	7.94	101.26	--	--	--	<250	<750	--	--	--	--	--	--	--	--	--		--
	3/30/1994	7.26	101.26	--	--	**1,900**	<250	<750	**2,200**	660	42	37	--	--	--	--	--		--
	4/13/1994	NM	101.26	--	--	**1,600**	<250	<750	**1,700**	610	0.90	40	--	--	--	--	--	<3.0	5.9
	6/21/1994	NM	101.26	--	--	<100	<250	<750	**350**	3.6	<0.50	7.2	--	--	--	--	--		--
	9/30/1994	8.47	101.26	--	--	<50	<250	<750	**52**	<0.50	<0.50	4.9	--	--	--	--	--		--
	12/29/1994	7.53	101.26	--	--	<50	<250	**930**	**24**	<0.50	<0.50	2.7	--	--	--	--	--		--
10.9	2/14/2017	8.76	42.74	33.98	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	<2.0	<2.0
	6/1/2017	8.71	42.74	34.03	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	ND	<0.1	--	<2.0
	9/6/2017	10.57	42.74	32.17	Insufficient Water Volume to Sample														
	12/6/2017	9.44	42.74	33.30	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
	3/1/2018	8.84	42.74	33.90	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

TABLE 2
CUMULATIVE GROUNDWATER ANALYTICAL RESULTS
Bothell 76 (Unocal 5905)
18015 Bothell Way Northeast
Bothell, Washington

MW10

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
	3/23/1992	7.56	99.35	2.38	--	<100	<500	--	**55**	<0.5	<0.5	10	--	--	--	--	--	--	12
	4/20/1992	NM	99.35	NM	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.0	3
	6/9/1992	8.12	99.35	2.06	--	73	<500	--	1.3	<0.50	<0.50	<0.5	--	--	--	--	--	--	--
DUP	6/9/1992	8.12	99.35	2.06	--	--	<500	--	--	--	--	--	--	--	--	--	--	--	--
	9/1/1992	8.46	99.35	1.72	--	<50	<250	--	4.9	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
	12/3/1992	9.11	99.35	0.83	--	<50	170	<380	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	10.5	
	3/19/1993	8.05	99.35	2.13	--	<50	130	<380	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	
	6/16/1993	7.83	99.35	2.18	--	<100	290	900	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	<3.0	
	9/22/1993	8.32	99.35	1.69	--	--	<250	<750	--	--	--	--	--	--	--	--	--	--	
	1/12/1994	8.06	99.35	1.95	--	--	<250	<750	--	--	--	--	--	--	--	--	--	<3.0	
	3/30/1994	7.94	99.35	2.07	--	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	
	4/13/1994	NM	99.35	NM	--	<100	<250	<750	**17**	1.7	<0.50	<0.50	--	--	--	--	--	--	
	6/21/1994	8.17	99.35	1.84	--	<100	<250	<750	**10**	0.60	<0.50	<0.50	--	--	--	--	--	--	
	9/30/1994	8.26	99.35	1.75	--	<50	<250	<750	**88**	<0.50	<0.50	<1.0	--	--	--	--	--	--	
	12/29/1994	7.63	99.35	2.39	--	<50	<250	<750	**43**	<0.50	<0.50	<0.50	--	--	--	--	--	--	
15.0	2/14/2017	9.90	41.07	31.17	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	<2.0	<2.0
	6/1/2017	10.23	41.07	30.84	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	ND	<0.1	--	<2.0
	9/6/2017	11.36	41.07	29.71	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
	12/6/2017	10.30	41.07	30.77	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
	3/1/2018	10.05	41.07	31.02	--	<100	<200	<500	<1.0	<1.0	<1.0	<1.0	<0.01	<1.0	<5.0	--	--	--	<2.0
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

MW11

Well Depth	Sampling Date	Ground Water Level	Elevation (TOC north)*	Water Level Elevation(note)	TPH	TPHg	TPHd	TPHo	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB	EDC	MTBE	Halogenated VOCs	PAHs	Dissolved Lead	Total Lead
Feet		Feet Below TOC	Feet Above MSL	Feet Above MSL	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	--	--	µg/L	µg/L
14.8	6/22/1992	8.71	9.15	0.74	--	<50	--	--	<0.50	<0.50	<0.50	<0.5	--	--	--	--	--	<1.0	--
	9/1/1992	8.77	9.15	0.68	--	<50	<250	--	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	<2.0	--
	12/3/1992	8.35	9.15	1.10	--	<50	160	<380	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	3/19/1993	8.51	9.15	0.94	--	<50	170	<380	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	3/19/1993	NM	9.15	NM	--	<50	--	--	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	6/16/1993	8.27	9.15	1.00	--	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	9/22/1993	8.59	9.15	0.68	--	--	<250	<750	--	--	--	--	--	--	--	--	--	--	--
	1/12/1994	8.45	9.15	0.82	--	--	<250	<750	--	--	--	--	--	--	--	--	--	--	--
	3/30/1994	8.37	9.15	0.90	--	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	4/13/1994	NM	9.15	0.82	--	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	<3.0	6.9
	6/21/1994	8.45	9.15	0.71	--	<100	<250	<750	<0.50	<0.50	<0.50	<0.50	--	--	--	--	--	--	--
	9/30/1994	8.56	9.15	NM	--	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--
	12/29/1994	7.82	9.15	1.45	--	<50	<250	<750	<0.50	<0.50	<0.50	<1.0	--	--	--	--	--	--	--
		Well Destroyed																	
		MTCA Method A Cleanup Levels			--	800	500	500	5	1,000	700	1,000	0.01	5	20	Variable	Variable	15	15

TABLE 2

CUMULATIVE GROUNDWATER ANALYTICAL RESULTS

Bothell 76 (Unocal 5905)

18015 Bothell Way Northeast

Bothell, Washington

EXPLANATION

MTCA = Model Toxic Control Act Cleanup Level (WAC173-340-900)

TOC = Top of Casing MSL = Mean Sea Level

< = not detected at indicated Laboratory Detection Limits -- not analyzed /elevation not included due to uncertainty or missing measurement NM = Not Measured

* = TOC Elevations are relative to a bench mark prior to 2017, sourced from GeoEngineers' *Results of Ground Water Sampling - December 1994.* 2017 values measured by Aerotech field staff.

TPHg - Total Petroleum Hydrocarbons - Gasoline by Method NWTPH-Gx

TPHd - Total Petroleum Hydrocarbons - Diesel by Method NWTPH-Dx TPHo - Total Petroleum Hydrocarbons - Motor Oil by Method NWTPH-Dx extended

Benzene, Toluene, Ethylbenzene and Xylenes by EPA Methods 8021B and 8260B

MTBE = Methyl-tert-butyl-ether EDC = 1,2-Dichloroethane EDB = 1,2-Dibromoethane; and additional VOCs by EPA Method 8260B

HVOCs - Halogenated Volatile Organic Compounds by EPA Method 8010

Total and Dissolved Lead by EPA Method 7010 PAHs by EPA Method 8270 SIM

ND = Not Detected (multiple detection limits see laboratory report for further detail)

Bolded numbers and red-shaded cells denote concentrations above the MTCA Method A Cleanup Levels for groundwater

TABLE 3
CONTAMINATED STOCKPILE SAMPLE ANALYTICAL RESULTS
Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington

Sample ID	Sampling Date	TPH	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Lead
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Samples obtained from soil stockpiles disposed of at Roosevelt Regional Landfill									
SP-1(A)	02/26/91	180	<5	<5	--	--	--	--	--
SP-1(B)	05/15/91	44	<10	<10	<0.05	<0.05	<0.05	<0.05	--
WOSP-1	05/17/91	130	<10	12	<0.05	<0.05	<0.05	<0.05	--
OSPN-1	10/02/91	400	--	--	--	--	--	--	--
OSPN-2	10/02/91	400	--	--	--	--	--	--	--
OSPN-3	10/03/91	500	--	--	--	--	--	--	--
OSPN-4	10/03/91	270	--	--	--	--	--	--	--
OSPN-5	10/09/91	530	--	--	--	--	--	--	--
OSPN-6	10/09/91	850	--	--	--	--	--	--	--
OSPN-7	10/09/91	750	--	--	--	--	--	--	--
OSPN-8	10/09/91	65	--	--	--	--	--	--	--
OSPN-9	10/09/91	880	--	--	--	--	--	--	--
OSPN-10	10/10/91	2,700	--	--	--	--	--	--	--
OSPN-11	10/10/91	190	--	--	--	--	--	--	--
OSPN-12	10/10/91	870	--	--	--	--	--	--	--
OSPN-13	10/10/91	1,600	--	--	--	--	--	--	--
OSPN-14(A)	12/02/91	--	--	280	--	--	--	--	--
OSPN-14(B)	02/12/92	130	ND	ND	<0.029	0.13	0.060	0.33	--
OSPN-15(A)	12/02/91	--	--	350	<0.025	<0.025	<0.025	<0.025	--
OSPN-15(B)	12/13/91	270	**130**	73	<0.025	<0.025	<0.025	0.071	--
OSPN-16	12/02/91	--	--	480	--	--	--	--	--
OSPN-17	12/02/91	--	--	1,600	--	--	--	--	--
OSPN-18	12/02/91	--	--	170	--	--	--	--	--
OSPN-19	12/02/91	--	--	400	--	--	--	--	--
OSPN-20	12/02/91	--	--	49	--	--	--	--	--
OSPN-21	12/02/91	--	--	--	--	--	--	--	--
T-1	10/08/91	--	**2,000**	**23,000**	--	--	--	--	--
RSP-1	02/12/92	54	--	--	--	--	--	--	--
RSP-2	02/12/92	200	<5	<25	ND	ND	ND	ND	--
CNSP-6	02/14/92	200	<5	<25	<0.027	<0.027	<0.027	<0.027	--
PISP-1	02/13/92	--	10	37	<0.028	<0.028	<0.028	<0.028	--
PISP-2	02/14/92	--	<5	<25	<0.027	<0.027	<0.027	<0.027	--
PISP-3	02/14/92	--	890	760	<0.030	<0.030	0.060	0.20	--
PISP-4	02/17/92	--	10	38	<0.028	<0.028	<0.028	<0.028	--
MTCA Method A Cleanup Levels		--	100	2000	0.03	7	6	6	250

TABLE 3
CONTAMINATED STOCKPILE SAMPLE ANALYTICAL RESULTS
Bothell 76 / UNOCAL # 5905
The Market Bothell Landing
18015 Bothell Way Northeast
Bothell, Washington
2 of 2

Sample ID	Sampling Date	TPH	TPHg	TPHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	Lead
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Samples obtained from gasoline-contaminated soil stockpiles prior to treatment									
DSP-1	05/17/91	--	**52**	ND	<0.05	0.61	1.3	9.9	--
DSP-2	05/17/91	--	**34**	ND	<0.05	0.36	0.33	1.1	--
DSP-3	05/17/91	--	**62**	ND	0.13	2.3	0.94	5.8	--
GSPN-1	09/30/91	--	**930**	ND	0.16	7.8	5.7	54	ND
GSPN-2	10/01/91	--	8	ND	<0.025	0.11	0.036	0.44	--
GSPN-3	10/01/91	--	24	7	<0.025	0.088	0.10	2.0	--
GSPN-4	10/01/91	--	**180**	22	0.13	3.1	1.8	14	--
GSPN-5	10/01/91	--	21	7	<0.025	0.057	0.052	0.63	--
Samples obtained from gasoline-contaminated soil stockpiles after treatment									
GSPN-6	01/07/91	--	74	31	<0.025	0.15	0.18	2.9	--
GSPN-7	01/07/91	--	<5	<5	<0.025	<0.025	<0.025	<0.025	--
GSPN-8	01/07/91	--	<5	8	<0.025	<0.025	<0.025	<0.025	--
GSPN-9	01/07/91	--	11	15	<0.025	<0.025	<0.025	<0.025	--
GSPN-10	10/07/91	--	10	7	<0.025	<0.025	<0.025	0.20	--
GSPN-11	10/07/91	--	14	13	<0.025	<0.025	<0.025	<0.025	<2.2
GSPO-1	10/03/91	--	9	<5	<0.025	<0.025	0.35	0.48	--
GSPO-2	10/03/91	--	<5	<5	<0.025	<0.025	<0.025	0.030	--
GSPO-3	10/03/91	--	33	79	<0.025	<0.025	<0.025	0.18	--
GSPO-4	10/03/91	--	10	<5	<0.025	<0.025	<0.025	<0.025	--
GSPO-5	10/03/91	--	20	<5	<0.025	<0.025	<0.025	<0.025	--
GSPO-6	10/03/91	--	<5	<5	<0.025	<0.025	<0.025	<0.025	--
MTCA Method A Cleanup Levels		--	100	2000	0.03	7	6	6	250

MTCA = Model Toxic Control Act Cleanup Level (WAC173-340-900)

BGS = Below Ground Surface mg/kg = milligram of analyte per kilogram of soil

< = not detected at indicated Laboratory Detection Limits -- = not analyzed

Benzene , Toluene, Ethylbenzene, Xylenes by EPA Method 8021B/8020

TPHg - Total Petroleum Hydrocarbons - Gasoline by NWTPH-Gx/8020

TPHd - Total Petroleum Hydrocarbons - Diesel by NWTPH-Dx/8015 Modified

TPHo - Total Petroleum Hydrocarbons - Motor Oil by NWTPH-Dx extended/EPA Method 418.1

HVOCs - Halogenated Volatile Organic Compounds by EPA Method 8010

PCBs - Polychlorinated Biphenyls by EPA Method 8080

Lead by EPA Method 7010/7471

ND = Not Detected; mulitiple detection limits, see laboratory reports for specific detection limits

B = Also deteceted in method blank. Methylene Chloride is a comon laboratory contaminant.

Bolded numbers and red-shaded cells denote concentrations above the MTCA Method A Cleanup Levels for soil

* = Soil from which this sample originated was removed during the Remedial Excavation

Appendix A

Boring Logs

AEROTECH
ENVIRONMENTAL CONSULTING

Boring: B1

Project: Bothell 76

Project No.:

Address: 18015 Bothell Wy NE
Bothell, WA

Drilling Contractor: Standard Environmental Probe
Drilling Method: Direct Push
Borehole Diameter: 2-inch
Sampler Type: Macrocore

Logged by: Simon Payne
Boring Depth: 10 Feet
Groundwater Encountered: No
Static Groundwater:

Surface Elevation: 60 Feet
Latt/Long: 47.758725°/ -122.210993°
Start Date: 01/04/19
End Date: 01/04/19

Depth (Ft)	Sample Interval/ Recovery	Blow Counts	PID Reading	USCS Classification	Description	Well Construction
1				GM	Surface: 1-inch Asphalt **SILTY GRAVEL:** Dark brown subangular coarse gravel with 10% medium sand; 15% fine sand; 20% silt; dry; no product odor	Backfilled with bentonite chips
2						
3						
4			2.1		No recovery between 4 and 6 feet below ground surface	
5						
6						
7			2.5			
8						
9						
10					Boring terminated at 10 feet below ground surface	
11						
12						
13						
14						
15						
16						
17						
18						
19						

AEROTECH
ENVIRONMENTAL CONSULTING

Boring: B2

Project: Bothell 76

Project No.:

Address: 18015 Bothell Wy NE
Bothell, WA

Drilling Contractor: Standard Environmental Probe
Drilling Method: Direct Push
Borehole Diameter: 2-inch
Sampler Type: Macrocore

Logged by: Simon Payne
Boring Depth: 10 Feet
Groundwater Encountered: No
Static Groundwater:

Surface Elevation: 60 Feet
Latt/Long: 47.758753° / -122.210993°
Start Date: 01/04/19
End Date: 01/04/19

Depth (Ft)	Sample Interval/ Recovery	Blow Counts	PID Reading	USCS Classification	Description	Well Construction
0					Surface: 1-inch Asphalt	
1–5			2.8	SM	**SILTY SAND:** Medium brown medium sand with 20% coarse sand; 20% coarse subrounded gravel; 20% silt; moderate induration; dry; no product odor	Backfilled with bentonite chips
6–9			3.5	SP	**SAND:** Light brown fine sand with 10% medium sand; trace silt; weak induration; dry; no product odor Wet below 9 feet	
10					Boring terminated at 10 feet below ground surface	
11–19						

AEROTECH
ENVIRONMENTAL CONSULTING

Boring: B3

Project: Bothell 76

Project No.:

Address: 18015 Bothell Wy NE
Bothell, WA

Drilling Contractor: Standard Environmental Probe
Drilling Method: Direct Push
Borehole Diameter: 2-inch
Sampler Type: Macrocore

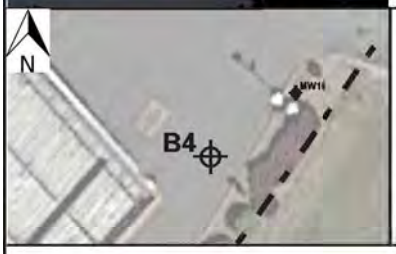
Logged by: Simon Payne
Boring Depth: 8 Feet
Groundwater Encountered: No
Static Groundwater:

Surface Elevation: 60 Feet
Latt/Long: 47.758740° / -122.210955°
Start Date: 01/04/19
End Date: 01/04/19

Depth (Ft)	Sample Interval/ Recovery	Blow Counts	PID Reading	USCS Classification	Description	Well Construction
1				GM	Surface: 1-inch Asphalt **SILTY GRAVEL:** Grey-brown subrounded coarse gravel with 20% coarse sand; 10% medium sand; 20% silt; weak induration; dry; no product odor	Backfilled with bentonite chips
2						
3			4.1			
4						
5						
6				SM	**SILTY SAND:** Light brown fine sand with 20% silt; moderate induration; damp; no product odor	
7			3.1			
8					Boring terminated at 8 feet below ground surface	
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

AEROTECH
ENVIRONMENTAL CONSULTING

Boring: B4



Project: Bothell 76

Project No.:

Address: 18015 Bothell Wy NE
Bothell, WA

Drilling Contractor: Standard Environmental Probe
Drilling Method: Direct Push
Borehole Diameter: 2-inch
Sampler Type: Macrocore

Logged by: Simon Payne
Boring Depth: 10 Feet
Groundwater Encountered: No
Static Groundwater:

Surface Elevation: 60 Feet
Latt/Long: 47.758710°/ -122.211010°
Start Date: 01/04/19
End Date: 01/04/19

Depth (Ft)	Sample Interval/ Recovery	Blow Counts	PID Reading	USCS Classification	Description	Well Construction
1				GM	Surface: 1-inch Asphalt **SILTY GRAVEL:** Dark grey to brown subangular coarse gravel with 20% fine gravel; 20% medium sand; 20% silt; weak induration; dry; no product odor	Backfilled with bentonite chips
2						
3			2.9			
4					No recovery between 3 and 6.5 feet below ground surface	
5						
6						
7			3.5			
8						
9						
10					Boring terminated at 10 feet below ground surface	
11						
12						
13						
14						
15						
16						
17						
18						
19						

AEROTECH ENVIRONMENTAL CONSULTING

Boring: B5

Project: Bothell 76

Project No.:

Address: 18015 Bothell Wy NE
Bothell, WA

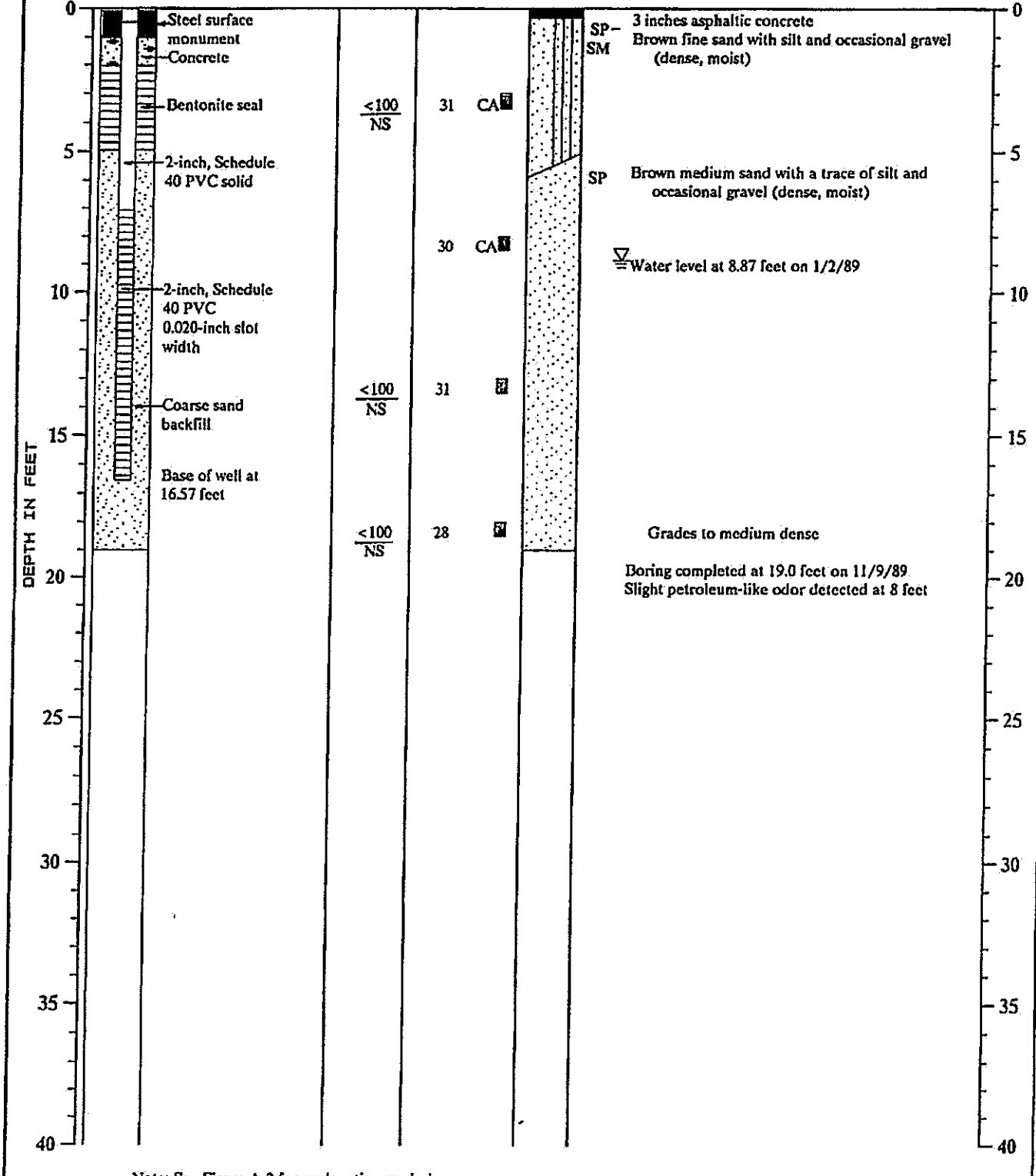
Drilling Contractor: Standard Environmental Probe
Drilling Method: Direct Push
Borehole Diameter: 2-inch
Sampler Type: Macrocore

Logged by: Simon Payne
Boring Depth: 10 Feet
Groundwater Encountered: 9 Feet
Static Groundwater:

Surface Elevation: 60 Feet
Latt/Long: 47.758714° / -122.210968°
Start Date: 01/04/19
End Date: 01/04/19

Depth (Ft)	Sample Interval/ Recovery	Blow Counts	PID Reading	USCS Classification	Description	Well Construction
1				SM	Surface: 1-inch Asphalt **SILTY SAND:** Grey and medium brown medium sand with 20% fine sand; 25% subrounded coarse gravel; 20% silt; weak induration; dry; no product odor	Backfilled with bentonite chips
2						
3						
4			2.8			
5						
6						
7			3.1			
8				SP	**SAND:** Light brown fine sand with 10% medium sand; trace silt; weak induration; wet; no product odor Saturated below 9 feet	
9						
10					Boring terminated at 10 feet below ground surface	
11						
12						
13						
14						
15						
16						
17						
18						
19						

MONITOR WELL NO. MW-1



Note: See Figure A-2 for explanation symbols

LRM: JAM: CDO 1/12/90

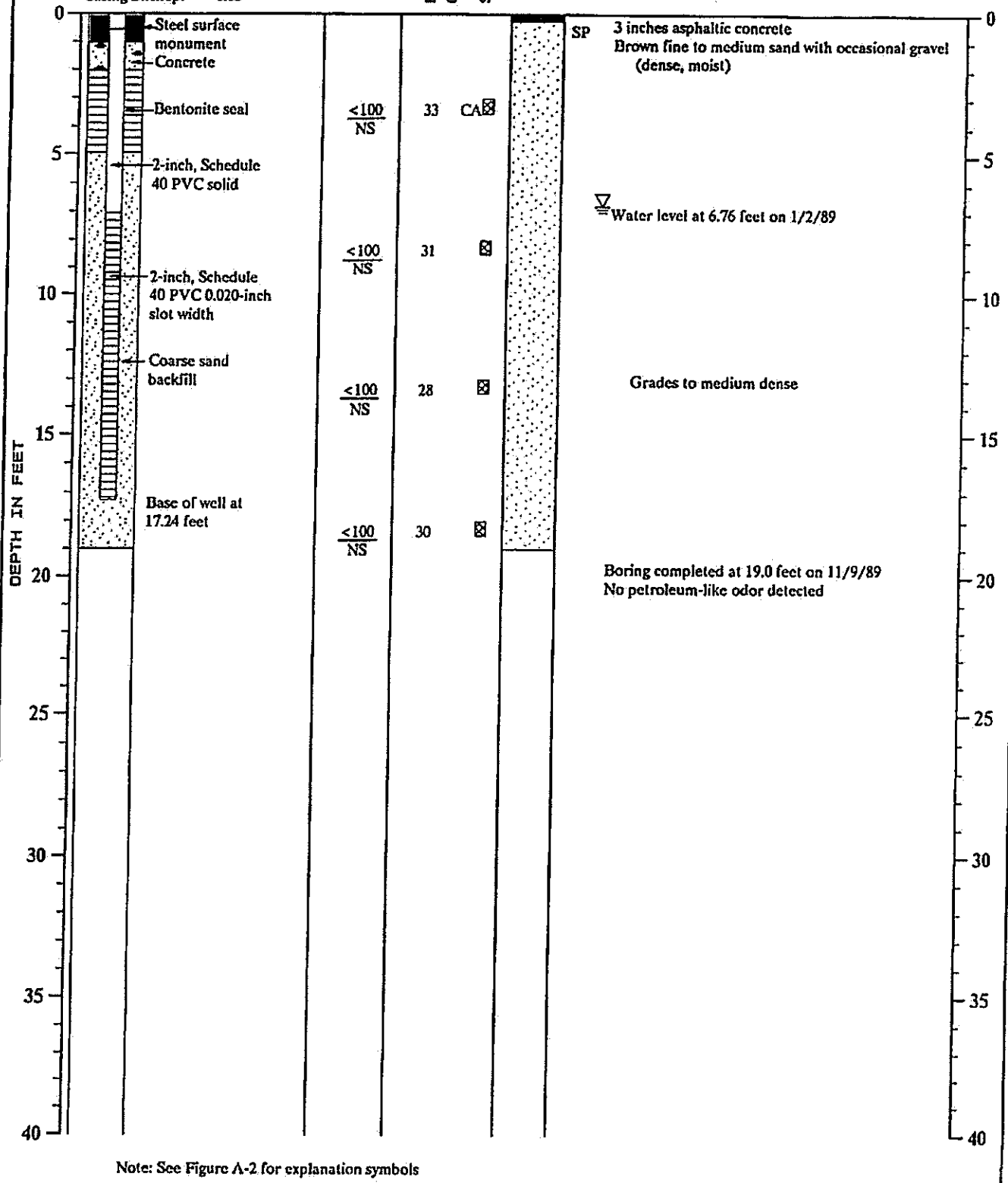
0161-183-B04

Geo Engineers

Log of Monitor Well

Figure A-3

MONITOR WELL NO. MW-2



Note: See Figure A-2 for explanation symbols

Geo Engineers

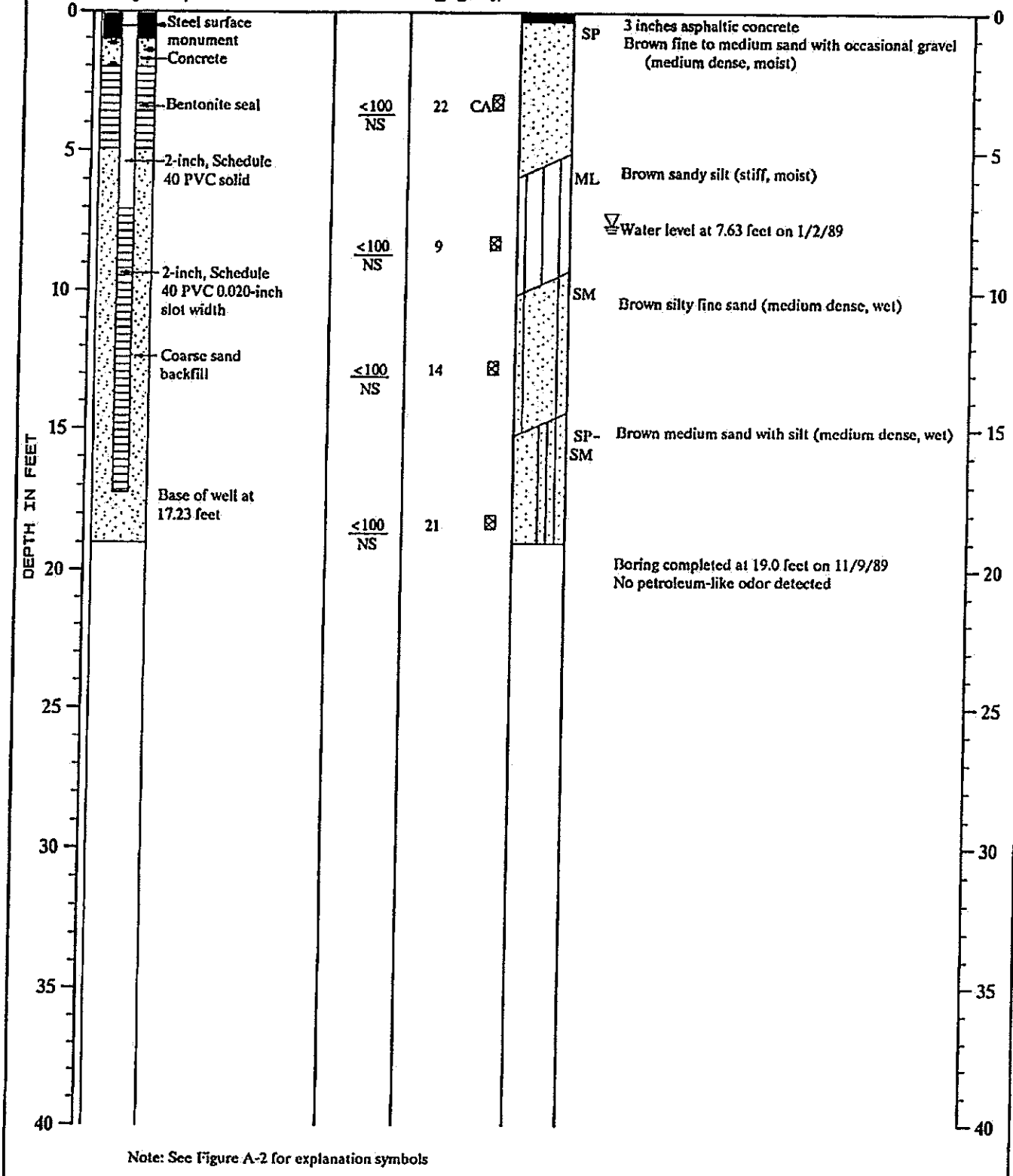
Log of Monitor Well

Figure A-4

LRM: JAM: CDO 1/12/90

0161-183-B04

MONITOR WELL NO. MW-3



Note: See Figure A-2 for explanation symbols

LRM:JAM:CDO 1/12/90

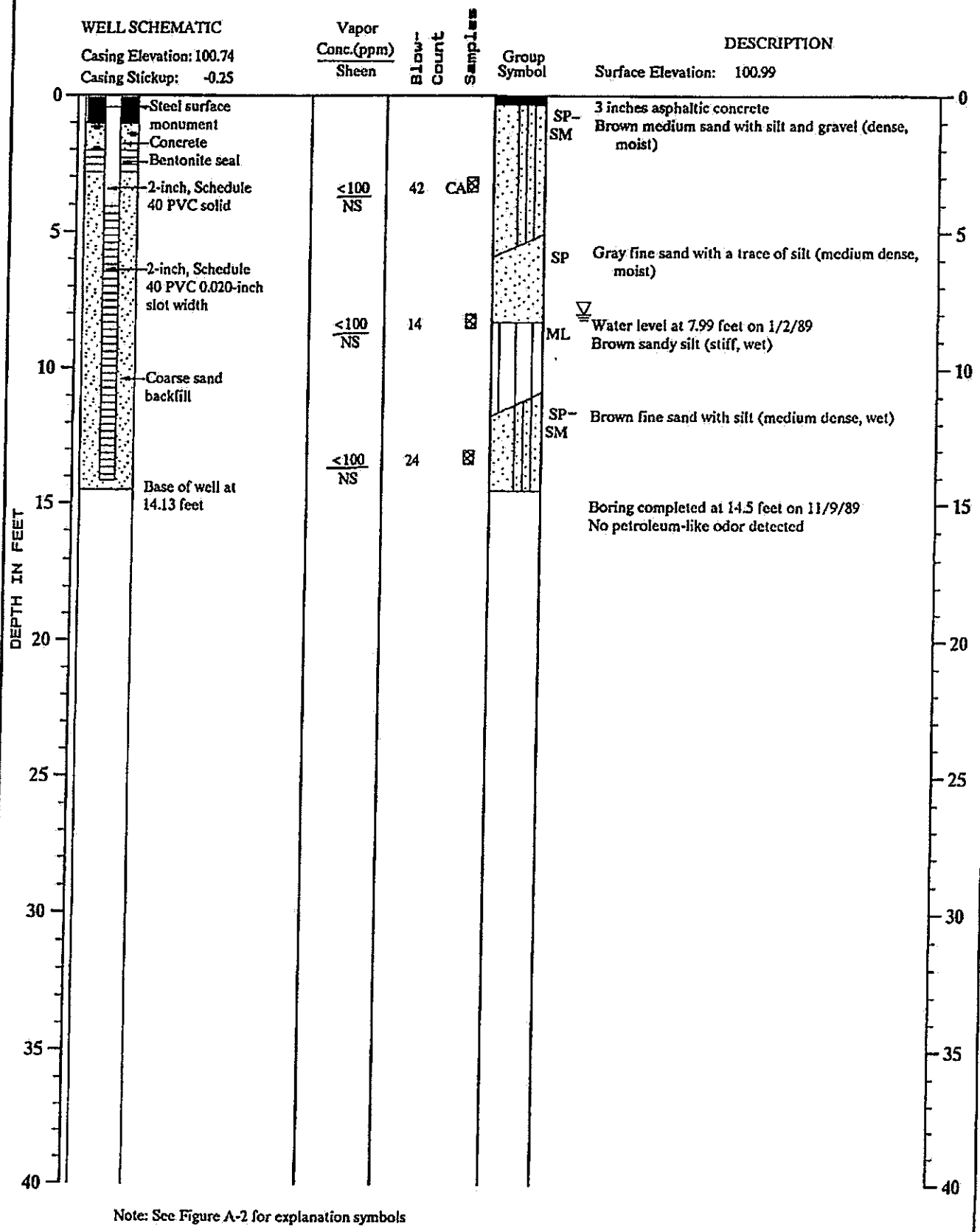
0161-183-B04

GeoEngineers

Log of Monitor Well

Figure A-5

MONITOR WELL NO. MW-4



Note: See Figure A-2 for explanation symbols

LRM:JAM:CDO 1/12/90

0161-183-804

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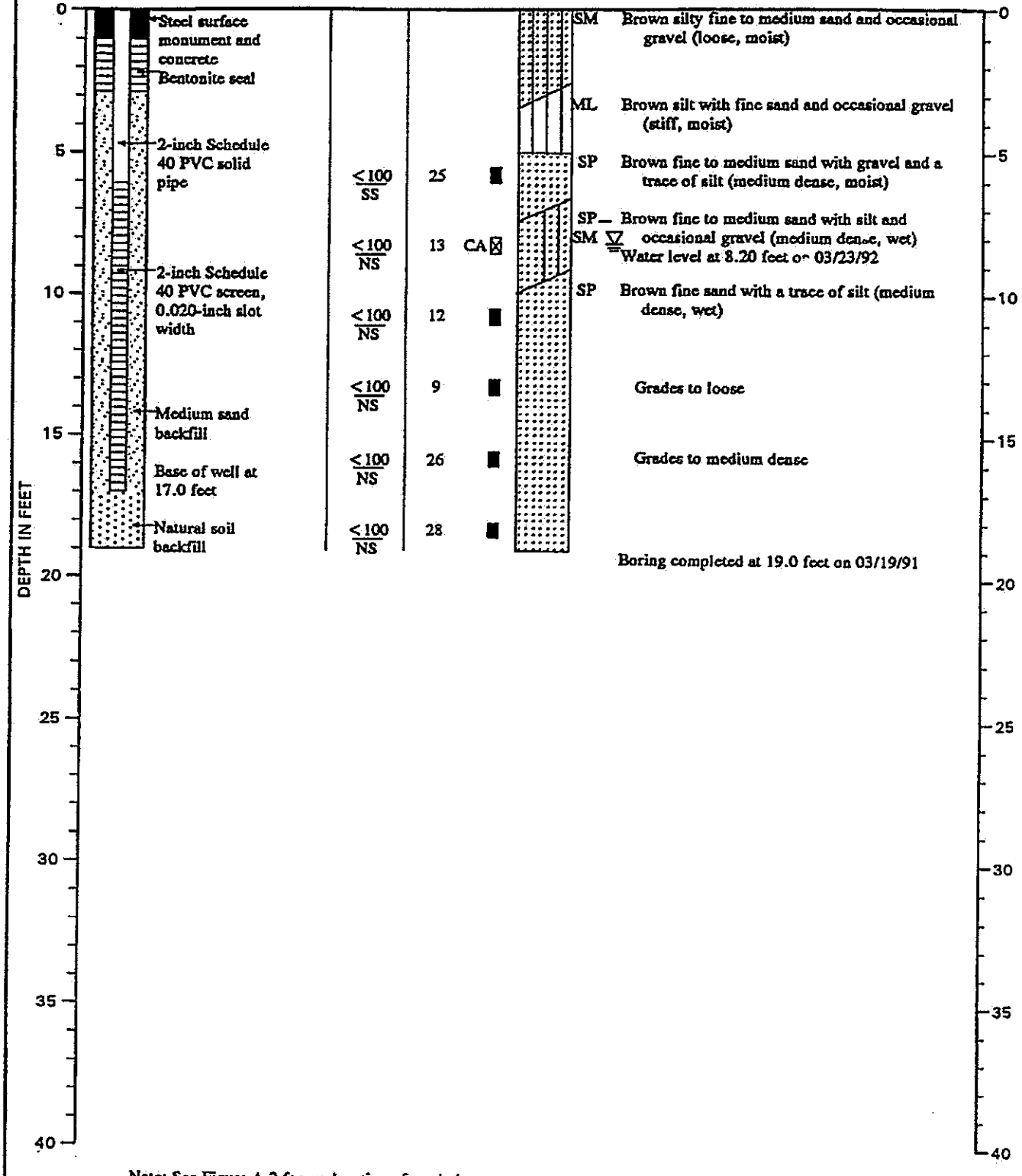
Log of Monitor Well

Figure A-6

MONITORING WELL NO. MW-5



Note: See Figure A-2 for explanation of symbols

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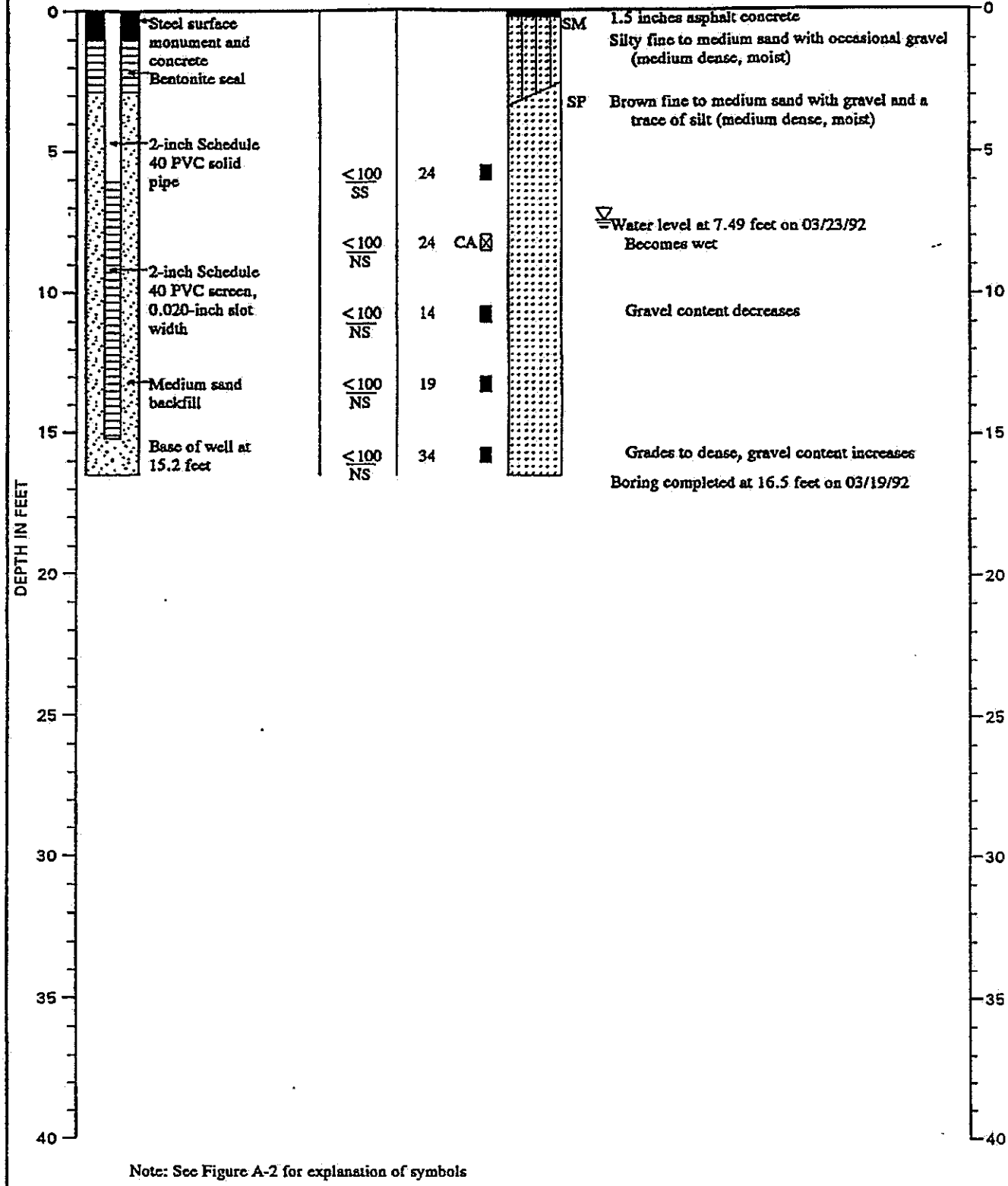
LOG OF MONITORING WELL

FIGURE A-3

MONITORING WELL NO. MW-6



Note: See Figure A-2 for explanation of symbols

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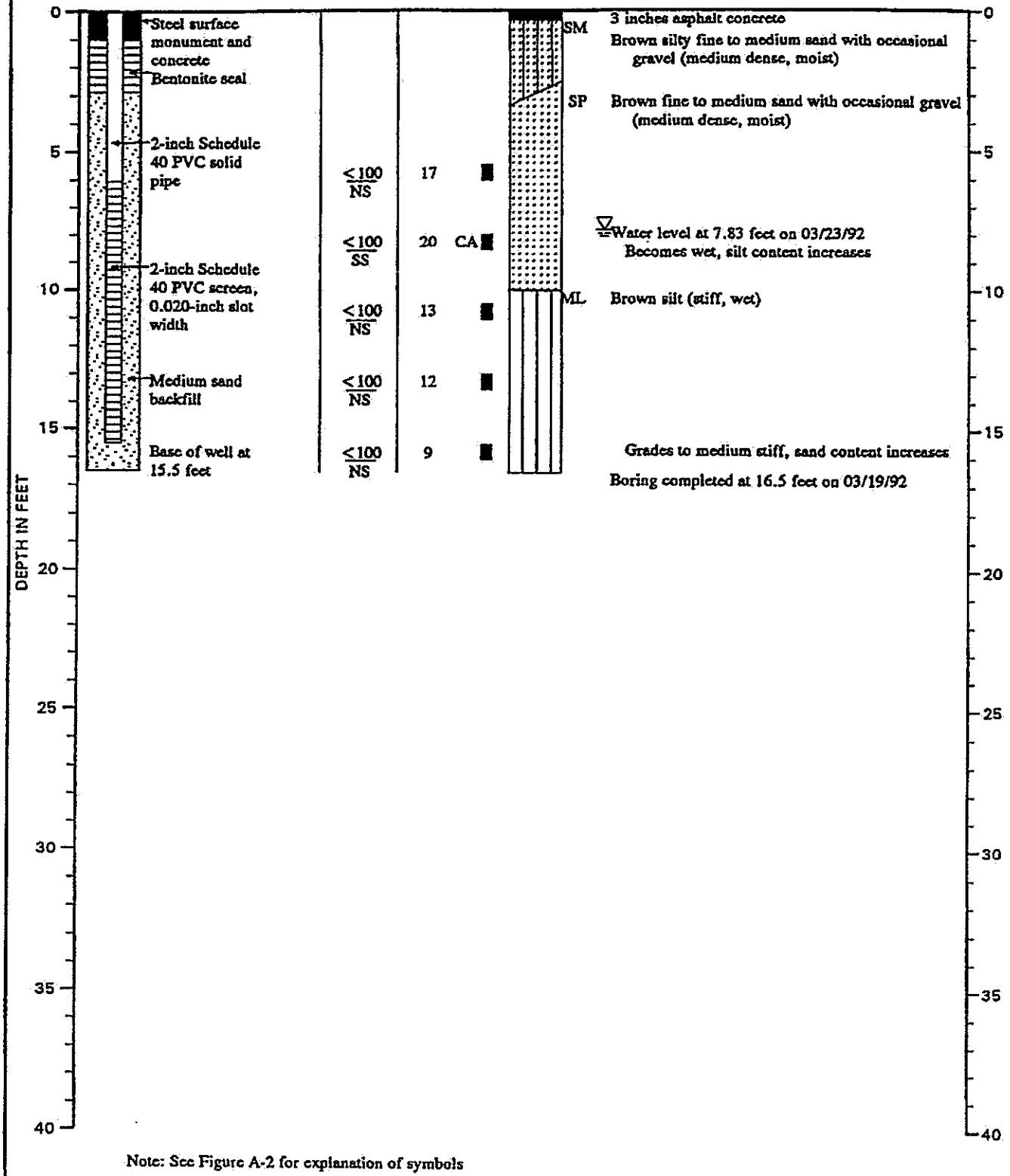
LOG OF MONITORING WELL

FIGURE A-4

MONITORING WELL NO. MW-7



Note: See Figure A-2 for explanation of symbols

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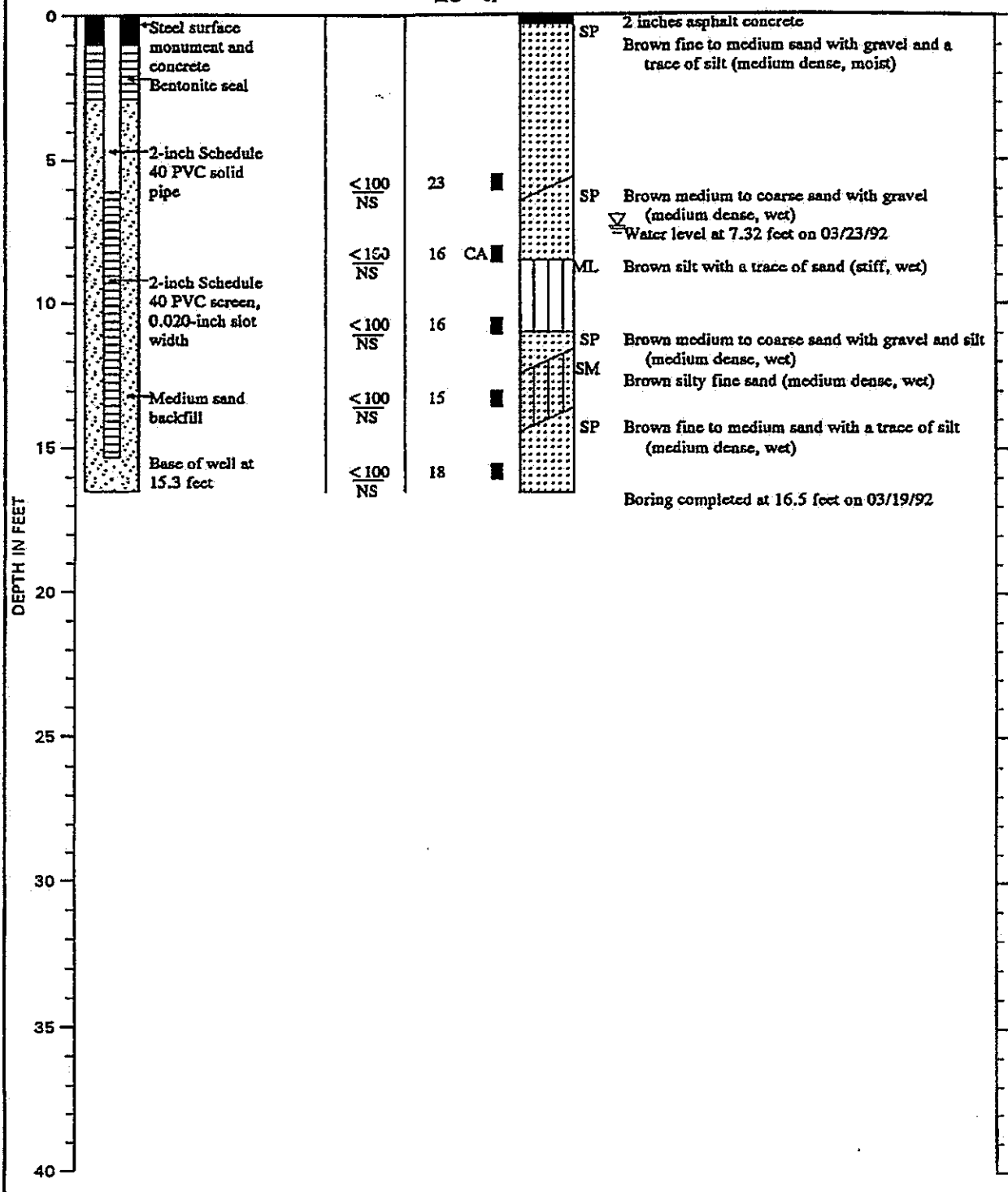
LOG OF MONITORING WELL

FIGURE A-5

MONITORING WELL NO. MW-8

WELL SCHEMATIC

Casing Elevation (ft.): 101.18
Casing Stickup (ft.): -0.34



Note: See Figure A-2 for explanation of symbols

Geo Engineers

LOG OF MONITORING WELL

FIGURE A-6

MONITORING WELL NO. MW-9

WELL SCHEMATIC

Casing Elevation (ft.): 101.26
Casing Stickup (ft.): -0.30

Vapor Conc.(ppm) / Sheen	Blow Count	Samples	Group Symbol	DESCRIPTION (Surface Elevation (ft.): 101.56)
			GP GM	Gray fine gravel with sand and silt (dense, moist) (crushed rock fill)
≤100 / SS	58	■		
				▽ Water level at 7.13 feet on 03/23/92
≤100 / NS	38	CA ☒	GP	Reddish brown cobbles (dense, wet) (quarry spalls backfill)
≤100 / NS	23	CA ■	SP— SM	Brown fine to medium sand with silt (medium dense, wet)
			SM	Brown silty fine to medium sand and occasional gravel (medium dense, wet)
≤100 / NS	29	☒		
≤100 / NS	14	■		
				Boring completed at 16.5 feet on 03/20/92

Steel surface monument and concrete
Bentonite seal
2-inch Schedule 40 PVC solid pipe
2-inch Schedule 40 PVC screen, 0.020-inch slot width
Medium sand backfill
Base of well at 15.2 feet
Natural soil backfill

DEPTH IN FEET

0 5 10 15 20 25 30 35 40

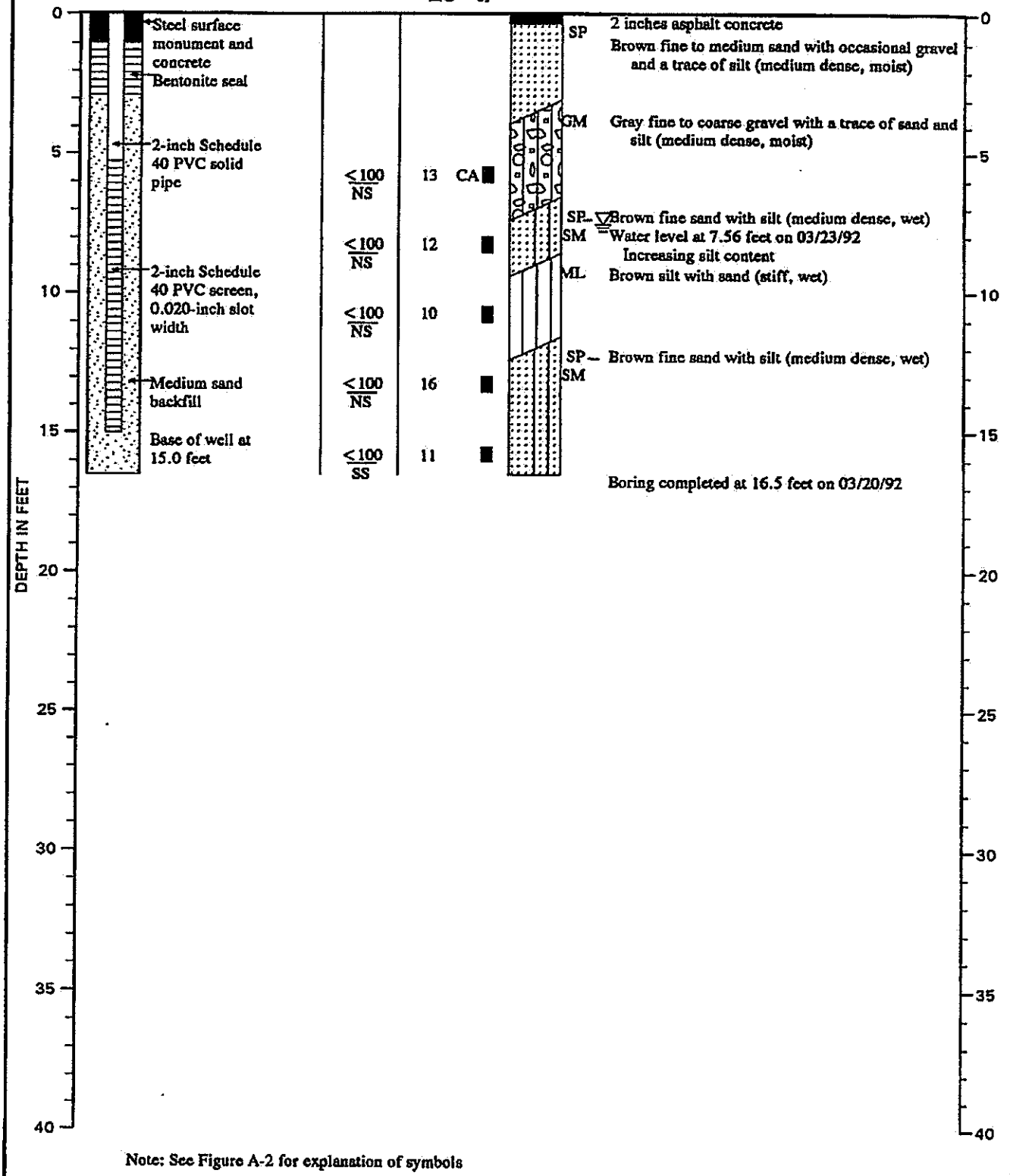
Note: See Figure A-2 for explanation of symbols

Geo Engineers

LOG OF MONITORING WELL

FIGURE A-7

MONITORING WELL NO. MW-10



Note: See Figure A-2 for explanation of symbols

Geo Engineers

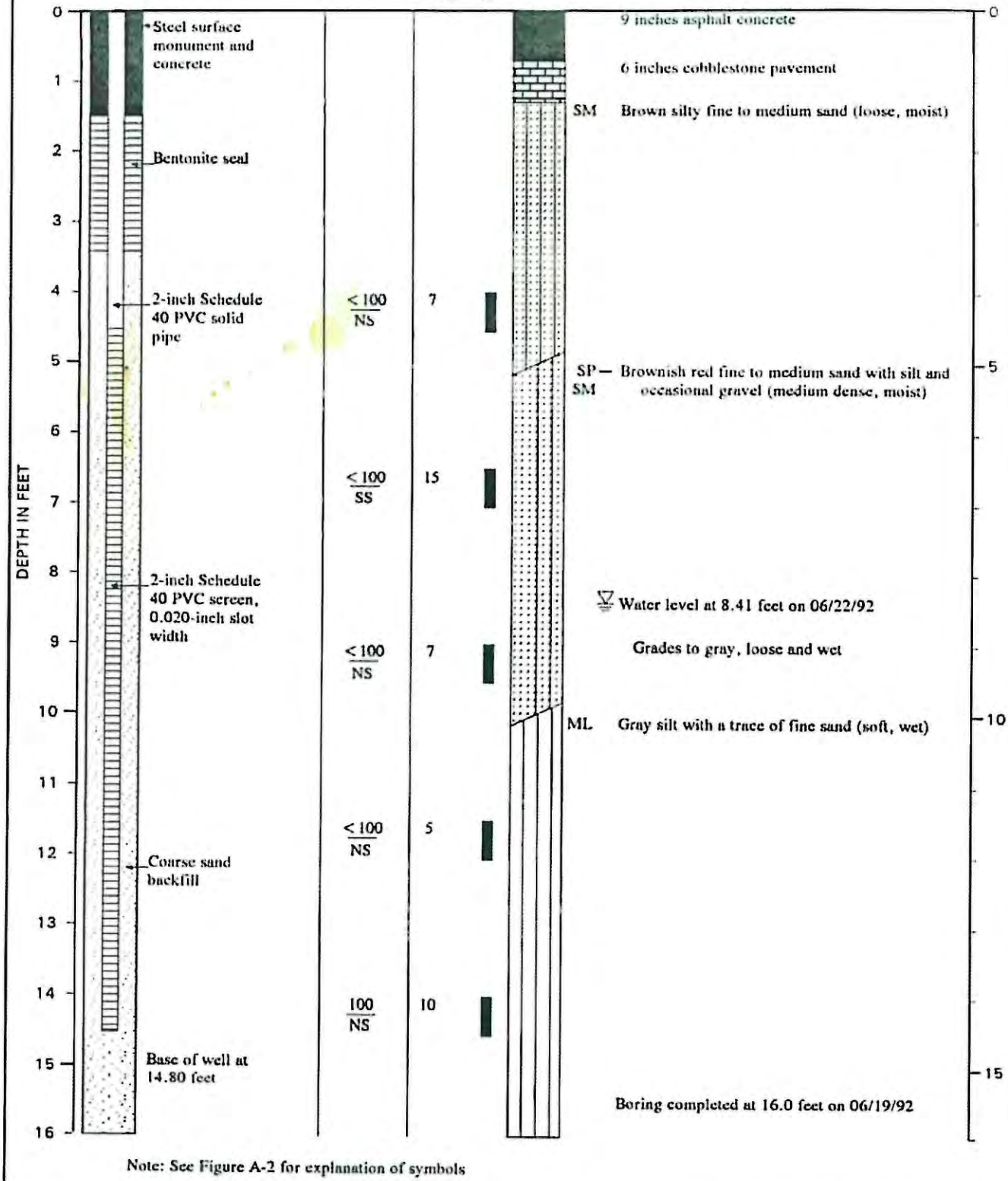
LOG OF MONITORING WELL

FIGURE A-8

:LJB:MET:CMS 6/15/92

0161-183-R04

MONITORING WELL NO. MW-11



Note: See Figure A-2 for explanation of symbols

NLP JKH CMS 11/23/92

0161-183-R04

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LOG OF MONITORING WELL

FIGURE A-3

Appendix B

Laboratory Analytical Reports

ADVANCED ANALYTICAL

Environmental Testing Laboratory

January 09, 2019

Simon Payne
Aerotech Environmental, Inc.
13925 Interurban Avenue South, Suite 210
Seattle, WA 98168

Dear Mr. Payne:

Please find enclosed the analytical data report for the *Bothell 76 NW3177* ***(C90104-1)*** Project.

Samples were received on *January 04, 2019.* The results of the analyses are presented in the attached tables. Applicable reporting limits, QA/QC data and data qualifiers are included. A copy of the chain-of-custody and an invoice for the work is also enclosed.

ADVANCED ANALYTICAL LABORATORY appreciates the opportunity to provide analytical services for this project. Should there be any questions regarding this report, please contact me at (425) 702-8571.

It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,

V. Ivanov

Val G. Ivanov, Ph.D.
Laboratory Manager

4078 148 Ave NE■ Redmond, WA 98052
425.702-8571
E-mail: aachemlab@yahoo.com

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number:	C90104-1
Client:	Aerotech Environmental
Project Manager:	Simon Payne
Client Project Name:	Bothell 76
Client Project Number:	NW3177
Date received:	01/04/19

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number: C90104-1
Client: Aerotech Environmental
Project Manager: Simon Payne
Client Project Name: Bothell 76
Client Project Number: NW3177
Date received: 01/04/19

Analytical Results

NWTPH-Gx / BTEX		MTH BLK	LCS	B1(7-7.5)	B1(8-8.5)	B1(8-8.5) Dupl	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19
Date analyzed	Limits	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19	01/07/19
NWTPH-Gx, mg/kg									
Mineral spirits/Stoddard	5.0	nd		nd	nd	nd			
Gasoline	5.0	nd		nd	nd	nd			
BTEX 8021B, mg/kg									
Benzene	0.020	nd	80%	nd	nd	nd	89%	83%	8%
Toluene	0.050	nd	73%	nd	nd	nd	71%	75%	5%
Ethylbenzene	0.050	nd		nd	nd	nd			
Xylenes	0.050	nd		nd	nd	nd			
Surrogate recoveries:									
Trifluorotoluene		85%	73%	77%	78%	70%	78%	77%	
Bromofluorobenzene		90%	73%	101%	78%	103%	79%	80%	

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
Results reported on dry-weight basis
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

ADVANCED ANALYTICAL

Chain of Custody Record

Page of

Laboratory Job #: C90104-1

4078 148 Avenue NE
Redmond, WA 98052
(425) 702-8571
aachemlab@yahoo.com

Client: Aerotech

Project Name: Bothell '76

Project Manager: Simon Payne

Project Number: NW3177

Address: 13925 Interurban Ave S

Collector: S. Payne

Phone: 206 247 9155 Fax:

Date of collection: 01/04/19

	Sample ID	Time	Matrix	Container type	8260 Volatiles	HVOC 8260	BTEX	BTEX/NWTPH-Gx	NWTPH-Gx	NWTPH-Dx	NWTPH-HCID	8270 Semivolatiles	8270 PAH	8082 PCBs	8081 Pesticides	RCRA 8 Metals	Lead	MTCA5 Metals	Notes, comments	# of containers
1	B1 (7-7.5)	0920	Soil					X												
2	B1 (8-8.5)	0925						X												
3	B2 (7-7.5)	0940																	hold	
4	B2 (8-8.5)	0945																	hold	
5	B3 (7-7.5)	1000																	hold	
6	B3 (7.5-8)	1005																	hold	
7	B4 (7-7.5)	1015																	hold	
8	B4 (8-8.5)	1020																	hold	
9	B5 (7-7.5)	1030																	hold	
10	B5 (8-8.5)	1040	↓																hold	
11																				
12																				

Relinquished by:	Date/Time	Received by:	Date/Time
	01/04/19 11:36	Inanov	01/04/19 11:36
Relinquished by:	Date/Time	Received by:	Date/Time

Sample receipt info:

Total # of containers:

Condition (temp, °C)

Seals (intact?, Y/N)

Comments:

Turnaround time:

Same day O

24 hr O

48 hr O

Standard ✓

ADVANCED ANALYTICAL

Environmental Testing Laboratory

January 24, 2019

Simon Payne
Aerotech Environmental, Inc.
13925 Interurban Avenue South, Suite 210
Seattle, WA 98168

Dear Mr. Payne:

Please find enclosed the analytical data report for the *Bothell 76 NW3177* ***(C90122-2)*** Project.

Samples were received on *January 22, 2019.* The results of the analyses are presented in the attached tables. Applicable reporting limits, QA/QC data and data qualifiers are included. A copy of the chain-of-custody and an invoice for the work is also enclosed.

ADVANCED ANALYTICAL LABORATORY appreciates the opportunity to provide analytical services for this project. Should there be any questions regarding this report, please contact me at (425) 702-8571.

It was a pleasure working with you, and we are looking forward to the next opportunity to work together.

Sincerely,

V. Ivanov

Val G. Ivanov, Ph.D.
Laboratory Manager

4078 148 Ave NE■ Redmond, WA 98052
425.702-8571
E-mail: aachemlab@yahoo.com

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number:	C90122-2
Client:	Aerotech Environmental
Project Manager:	Simon Payne
Client Project Name:	Bothell 76
Client Project Number:	NW3177
Date received:	01/22/19

Advanced Analytical Laboratory
(425) 702-8571

AAL Job Number: C90122-2
Client: Aerotech Environmental
Project Manager: Simon Payne
Client Project Name: Bothell 76
Client Project Number: NW3177
Date received: 01/22/19

Analytical Results

NWTPH-Gx / BTEX		MTH BLK	LCS	B1(6-6.5)	Dupl B1(6-6.5)	MS	MSD	RPD
Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Date extracted	Reporting	01/23/19	01/23/19	01/23/19	01/23/19	01/23/19	01/23/19	01/23/19
Date analyzed	Limits	01/23/19	01/23/19	01/23/19	01/23/19	01/23/19	01/23/19	01/23/19
NWTPH-Gx, mg/kg								
Mineral spirits/Stoddard	5.0	nd		nd	nd			
Gasoline	5.0	nd		nd	nd			
BTEX 8021B, mg/kg								
Benzene	0.020	nd	80%	nd	nd	87%	70%	22%
Toluene	0.050	nd	74%	nd	nd	83%	79%	6%
Ethylbenzene	0.050	nd		nd	nd			
Xylenes	0.050	nd		nd	nd			
Surrogate recoveries:								
Trifluorotoluene		95%	96%	76%	92%	83%	99%	
Bromofluorobenzene		99%	103%	113%	112%	94%	129%	

Data Qualifiers and Analytical Comments
nd - not detected at listed reporting limits
na - not analyzed
C - coelution with sample peaks
M - matrix interference
Results reported on dry-weight basis
Acceptable Recovery limits: 70% TO 130%
Acceptable RPD limit: 30%

ADVANCED ANALYTICAL

Chain of Custody Record

Page of

Laboratory Job #: C901122-2

4078 148 Avenue NE
Redmond, WA 98052
(425) 702-8571
aachemlab@yahoo.com

Client: Jacobs

Project Manager: Simon Payne

Address: 13725 Interurban Ave S, Seattle

Phone: Fax:

Project Name: Bothell 76

Project Number: NW 3177

Collector: S. Payne

Date of collection: 01/22/19

	Sample ID	Time	Matrix	Container type	8260 Volatiles	HVOC 8260	BTEX	BTEX/NWTPH-Gx	NWTPH-Gx	NWTPH-Dx	NWTPH-HCID	8270 Semivolatiles	8270 PAH	8082 PCBs	8081 Pesticides	RCRA 8 Metals	Lead	MTCA5 Metals	Notes, comments	# of containers
1	B1 (0-6.5)	0830	Soil					X												
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
11																				
12																				

Relinquished by:	Date/Time	Received by:	Date/Time
	01/22/19 0830	V Acallo	01/22/19 1515
Relinquished by:	Date/Time	Received by:	Date/Time

Sample receipt info:

Total # of containers:

Condition (temp, °C)

Seals (intact?, Y/N)

Comments:

Turnaround time:

Same day O

24 hr O

48 hr O

Standard ✓O

Appendix C

Field Protocols

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Environmental Consulting Inc.

13925 Interurban Avenue South, Suite 210
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(360) 710-5899

512 W. International Airport Road, Suite 201
Anchorage, Alaska 99518
(907) 575-6661

SOIL BORING AND WELL INSTALLATION STANDARD OPERATING PROCEDURE

EQUIPMENT *(Items in italic provided by drilling subcontractor, verify according to the site sampling plan they bring the appropriate equipment and material.)*

- Sampling and Analyses Plan (SAP)
- Site-specific sampling plan
- Sample location map
- Sample table
- Safety equipment, as specified in the Health and Safety Plan
- Permanent pens/marker (e.g. Sharpies®)
- Site logbook, boring log and/or sampling form
- Camera
- Candlestick/cones/barricade
- Caution tape
- Trash bags/plastic sheeting
- Assorted tools (e.g. shovels, wrenches, etc.)
- *Annular materials: silica sand, bentonite pellets and chips, grout*
- *Monitoring well materials: 2-inch schedule 40 PVC riser, well screen and end caps*
- *Completion materials: posts or traffic rated steel monuments, concrete mix, concrete forms*
- *Drilling rig (e.g. hollow stem auger, air/mud rotary, direct push, or sonic)*
- *Disposable acetate liners for direct push*
- *Decontamination equipment such as pressure washer to decontaminate rig and bucket with water and phosphate-free soap (e.g. Alconox®, Liquinox®) for split spoon samplers*

Preliminary Activities

Prior to the onset of field activities at the site, Aerotech obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Aerotech marks the borehole locations and contacts the local one call utility locating service at least 2 full business days prior to the start of work to mark buried utilities. Borehole locations may also be checked for buried utilities by a private geophysical surveyor. Additionally, borehole locations may be cleared via air-knife and vacuum operations where proposed locations are in close proximity of buried utilities. Fieldwork is conducted under the advisement of a state registered professional geologist. Monitoring well construction will

comply with Monitoring Well Construction: General, 690-240-100 through Well Seals, WAC 173-160.

Drilling

Aerotech contracts a licensed driller to advance each boring and collect soil samples. The specific drilling method (e.g., hollow-stem auger, direct push method, or sonic drilling), sampling method [e.g., core barrel or California-modified split spoon sampler (CMSSS)] and sampling depths are documented on the boring log and may be specified in a work plan. Soil samples are typically collected at the capillary fringe and at 5-foot intervals to the total depth of the boring. To determine the depth of the capillary fringe prior to drilling, the static groundwater level is measured with a water level indicator in the closest monitoring well to the boring location, if available.

The borehole is advanced to just above the desired sampling depth. For CMSSSs, the sampler is placed inside the auger and driven to a depth of 18 inches past the bit of the auger. The sampler is driven into the soil with a standard 140-pound hammer repeatedly dropped from a height of 30 inches onto the sampler. The number of blows required to drive the sampler each 6-inch increment is recorded on the boring log. For core samplers (e.g., direct push), the core is driven 18 inches using the rig apparatus.

Soil Sampling

Soil is collected according to Aerotech's SOIL SAMPLING STANDARD OPERATING PROCEDURE.

Grab Groundwater Sampling from Soil Boring

In the event that undeveloped grab-groundwater samples are necessary for the scope of work, a temporary well screen is placed across the desired interval of the soil boring. The sample can be collected via disposable bailer or peristaltic pump and disposable tubing. Additionally if direct push technology has been utilized for advancing the soil boring, a groundwater sample, is collected from the boring by using HydropunchTM sampling technology. In the case of using HydropunchTM technology, after collecting the capillary fringe soil sample, the boring is advanced to the top of the soil/groundwater interface and a sampling probe is pushed to approximately 2 feet below the top of the static water level. The probe is opened by partially withdrawing it and thereby exposing the screen. New polyethylene tubing with a peristaltic pump or decontaminated bailer is used to collect a water sample from the probe. The water sample is then emptied into laboratory-supplied containers constructed of the correct material and with the correct volume and preservative to comply with the proposed laboratory test. The container is slowly filled with the retrieved water sample until no headspace remains and then promptly sealed with a Teflon-lined cap, checked for the presence of bubbles, labeled, entered onto a COC record and placed in chilled storage at 4° Celsius. Laboratory-supplied trip blanks accompany the water samples as a quality assurance/quality control procedure. Equipment blanks may be collected as required. The samples are kept in chilled storage and transported under COC protocol to a client-approved, state-certified laboratory for analysis.

Field Screening Procedures

Aerotech staff place the soil from the middle of the sampling interval into a plastic re-sealable bag. The bag is then labeled with the sample number. The tip of a photoionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The highest sustained PID measurement is recorded on the boring log. At a minimum, the PID or organic vapor monitoring device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Aerotech trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, which is included in the final report.

Backfilling of Soil Boring

If a well is not installed, the boring is backfilled from total depth to approximately 5 feet below ground surface (bgs) with either neat cement or bentonite grout using a tremie pipe. The boring is backfilled from 5 feet bgs to approximately 1 foot bgs with hydrated bentonite chips. The borehole is completed from 1 foot bgs to surface grade with material that best matches existing surface conditions and meets local agency requirements. Site-specific backfilling details are shown on the respective boring log.

Monitoring Well Construction

A well (if constructed) is completed using materials documented on the boring log or specified in a work plan. The well is constructed with slotted casing across the desired groundwater sampling depth(s) and completed with blank casing to within 6 inches of surface grade. No further construction is conducted on temporary wells. For permanent wells, the annular space of the well is backfilled with Monterey sand from the total depth to approximately 2 feet above the top of the screened casing. A hydrated granular bentonite seal is placed on top of the sand filter pack. Grout may be placed on top of the bentonite seal to the desired depth using a tremie pipe. The well may be completed to surface grade with a 1-foot thick concrete pad. A traffic-rated well vault and locking cap for the well casing may be installed to protect against surface-water infiltration and unauthorized entry. Site-specific well construction details including type of well, well depth, casing diameter, slot size, length of screen interval and sand size are documented on the boring log or specified in the work plan.

Monitoring Well Development

Following well construction, each monitoring well is developed and surveyed according to Aerotech's MONITORING WELL DEVELOPMENT AND SURVEYING STANDARD OPERATING PROCEDURE.

Well Sampling

Following development, groundwater is collected according to Aerotech's LOW-FLOW GROUNDWATER SAMPLING STANDARD OPERATING PROCEDURE.

Decontamination Procedures

Aerotech and/or the contracted driller decontaminate soil and water sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. Deionized water may be used for the final rinse. Downhole drilling equipment is steam-cleaned prior to drilling the borehole and at completion of the borehole.

Waste Treatment and Soil Disposal

Soil cuttings and decontamination fluids generated from the drilling or sampling are stored on site in labeled, Department of Transportation-approved, 55-gallon drums or other appropriate storage container. Unless otherwise specified in the contract with Aerotech, the client is responsible for disposal of investigation derived waste. Should Aerotech be contracted to complete disposal for the client, drums containing investigation derived waste are subsequently transported under manifest to a client- and regulatory-approved facility for disposal.

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512 W. International Airport Road, Suite 201
Anchorage, Alaska 99518
(907) 575-6661

SOIL SAMPLING STANDARD OPERATING PROCEDURE

EQUIPMENT

- Sampling and Analyses Plan (SAP)
- Site-specific sampling plan
- Sample location map
- Sample table
- Safety equipment, as specified in the Health and Safety Plan
- Permanent pens/marker (e.g. Sharpies®)
- Site logbook and/or sampling form
- Camera
- Screening equipment (e.g. Photoionization detector (PID))
- Survey stakes or flags
- Tape measure or measuring wheel
- Plastic sheet
- Soil collection device, heavy equipment (e.g. spoons spade shovel, hand auger, hollow stem auger – split spoon sampler, direct push rig – macro core, shelby tube, backhoe)
- Syringes for EPA Method 5035
- Syringe tool for EPA Method 5035 (e.g. En Core® sampler)
- Pre-weighed and preserved sample vials for EPA Method 5035
- Stainless steel and/or plastic bowls (only if homogenizing composite samples)
- Sample containers, precleaned (e.g., I-Chem)
- Chain-of-custody forms, custody seals, sample labels
- Ziploc® Bags
- Insulated cooler
- Ice
- Plastic bags for sample containers and ice
- Decontamination equipment including tap water and/or deionized water and phosphate-free soap (e.g. Alconox®, Liquinox®)

Soil Sampling

Soil samples are preserved in the metal or plastic sleeve used with the California-modified split spoon sampler (CMSSS) or core sampler, in glass jars or other containers according to the test method and regulatory guidelines (e.g., Environmental Protection Agency Method 5035). Sleeves are removed from the sample barrel, and the lowermost sample sleeve is labeled. Soil is collected from the split spoon sample or direct push core sample into appropriate containers based on the planned test method. Besides the use of a drilling rig, soil may also be collected via hand auger or with a scoop or spoon from the surface or a selected interval from an excavation, trench or test pit.

Soil Sample Collection

Aerotech field personnel are to review the SAP for sample locations and analysis as well as obtain photograph(s) of the material before sampling. If the soil sample is to be a discrete sample, collect soil using a clean/decontaminated stainless-steel (organic analyses) or plastic (inorganic analyses) spoon. If the soil sample is to be a composite, collect soil from all locations to be sampled into one stainless-steel (organic analyses) or plastic (inorganic analyses) bowl and homogenize the soil. If the soil sample is to be a discrete sample for volatile analyses, collect soil using a syringe and place into appropriate pre-weighed sample vial (Volatiles samples may not be composited.).

Next, use the syringe, stainless-steel or plastic spoon to transfer soil sample as appropriate into sample container as specified by the analytical test method. Label and manage sample containers. Decontaminate sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. Deionized water may be used for the final rinse. Ensure activities are well documented in the site logbook or on a designated sampling form. (i.e. collection method, presence of sheen or odor and PID measurement.

Field Screening Procedures

Aerotech field staff place soil from sampling interval into a plastic re-sealable bag. The bag is then labeled with the sample number. The tip of a photoionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The highest sustained PID measurement is recorded on the boring log. At a minimum, the PID or organic vapor monitoring device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Aerotech trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, sampling form or logbook. Selected soil samples for analysis are then placed Samples are placed in a cooler chilled to 4º Celsius and transported to a state-certified laboratory under chain-of custody (COC) protocol.

Extractable Petroleum Hydrocarbons (EPH)/Volatile Petroleum Hydrocarbons (VPH)

To evaluate the potential utilization of site specific cleanup levels (e.g. Ecology's Method B or Method C cleanup levels), Aerotech field personnel will collect additional sample volume to complete EPH/VPH analysis. This test will be completed on samples that are containing petroleum hydrocarbons only, utilizing the previously discussed field screening procedures as well as contaminant source data from previous investigation work.

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MONITORING WELL DEVELOPMENT AND SURVEYING

EQUIPMENT

- Well location map
- Safety equipment, as specified in the Health and Safety Plan
- Permanent pens and markers (e.g. Sharpies®)
- Field notebook and/or sampling form
- Survey equipment
- Surge Block
- 55-Gallon Drums
- 5-Gallon Buckets
- 3/8" Tubing
- DC Power Source
- Whale® Pump
- Water Level Indicator
- Hand Tools (e.g. socket set, screw drivers)
- Watch
- Decontamination equipment including tap water and/or deionized water and phosphate-free soap (e.g. Alconox®, Liquinox®)

Preliminary Activities

Prior to the onset of field activities at the site, Aerotech obtains permission from the client to perform activities and obtains any appropriate permit(s) from potential governing agencies. Aerotech field personnel acquires surge block, tubing, down well pump, water quality monitoring equipment, containers for storing purge water and decontamination fluids and survey equipment, and verifies all are in operating condition. Fieldwork is conducted under the advisement of a state registered professional geologist.

Monitoring Well Development

When a permanent groundwater monitoring well is installed, proper well development is necessary to ensure that complete hydraulic connection is made and maintained between the well and the aquifer material surrounding the well screen and filter pack. Well development should

begin no sooner than 48 to 72 hours after well installation to allow grout to cure prior to improvement.

A surge block is used to move sediments from the filter pack into the well casing. A surge block consists of a rubber and metal plunger attached to Schedule 80 PVC sections of sufficient length to reach the bottom of the well. The surge block is constructed of materials that will not introduce contamination into the well. The surge block is moved up and down the well screen interval and then removed, followed by pumping with a downwell pump to remove any sand and silt brought into the well by the surging action. Care is taken to not surge too strongly with subsequent casing deformation or collapse. Surging will be followed by additional pumping to remove fine materials that may have entered the well during the surging effort.

After surging has been completed and the sand content of the pumped water has decreased, a submersible pump is used to continue well development. The pump should be moved up and down the well screen interval until the obtained water is relatively clear. Well development will continue until the water in the well clarifies. It should be noted that where very fine-grained formations are opposite the screened interval, continued well development until clear water is obtained might be impossible. Decisions regarding when to cease development where silty conditions exist will be made between amongst Aerotech personnel.

During well development, the primary criteria used to evaluate whether the well has been completely developed is water clarity. As mentioned above, clear water can often be impossible to obtain with environmental monitoring wells.

The minimum volume of water purged from the well during development will be approximately a minimum of 3 borehole volumes (wells will typically not reach stabilization of water quality parameters before this condition is achieved and may not have reached stability even after this threshold has been achieved). The above is a general guideline for difficult well development. Development water will be stored in 55-gallon Department of Transportation (DOT) -approved drums.

Surveying

If required, wells are surveyed relative to an established benchmark of known elevation above mean sea level to an accuracy of +/- 0.005 foot. The casing is notched or marked on one side to identify a consistent surveying and measuring point.

Decontamination Procedures

Aerotech personnel completing the monitoring well development equipment will also decontaminate between each monitoring well. The decontamination procedure will consist of washing with a non-phosphate solution, followed by a minimum of two tap water rinses. Deionized water may be used for the final rinse.

Waste Storage and Disposal

Decontamination fluids and purge water from well development and sampling activities are stored on site in labeled, DOT-approved storage containers. No containers will be left on-site

without a label indicating the material matric, accumulation date, project name, project address and Aerotech contact information. Unless otherwise specified in the contract with Aerotech, the client is responsible for disposal of investigation derived waste. Should Aerotech be contracted to complete disposal for the client, drums containing investigation derived waste are subsequently transported under manifest to a client- and regulatory-approved facility for disposal.

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LOW-FLOW GROUNDWATER SAMPLING STANDARD OPERATING PROCEDURE

EQUIPMENT

- Sampling and Analyses Plan (SAP)
- Site-specific sampling plan
- Sample location map
- Sample table
- Safety equipment, as specified in the Health and Safety Plan
- Permanent pens and markers (e.g. Sharpies®)
- Field notebook and/or sampling form
- Camera
- YSI water quality monitoring equipment (e.g. YSI monitor and flow through cell)
- Sample containers, precleaned (e.g., I-Chem)
- 55-Gallon Drums
- Two 5-Gallon Buckets
- 3/8" Tubing
- Power Source/cables
- Peristaltic or down-well pump
- Water Level Indicator
- Tool box with hand tools (e.g. socket set, screw drivers)
- Trash bags/plastic sheeting
- Candlestick/cones/barricade
- Caution tape
- Scissors/knife
- Paper towels
- Watch
- Decontamination equipment including tap water and/or deionized water and phosphate-free soap (e.g. Alconox®, Liquinox®)
- Chain-of-custody forms, custody seals, sample labels
- Ziploc® Bags
- Insulated cooler
- Ice
- Plastic bags for sample containers and ice

The following protocol and sampling procedures were designed to meet or exceed standards for groundwater monitoring well sampling, as specified by the State of Washington Department of Ecology *"Standard Operating Procedures for Purging and Sampling Monitoring Wells, Version 1.0,"* dated and approved on October 4, 2011. These procedures are strictly adhered to by Aerotech field staff:

Cross-Contamination Mitigation Protocol

A sampling table is set up adjacent to the well head in order to protect field equipment from contact with the ground, to prevent or minimize the possible introduction of foreign materials into the wells, and in general in order to mitigate the possibility of cross-contamination. Where previous laboratory data is available, or where visual of olfactory indicators provide initial evidence, well sampling order is arranged to proceed with the least contaminated well, often the upgradient groundwater monitoring wells, and sampling order proceeds by sampling wells associated with successively higher contamination levels. Thus, the wells exhibiting the highest contamination levels are sampled last, in order to minimize the possibility of cross contamination.

A fresh pair of disposable Nitrile gloves is worn at each well. Equipment neither disposable nor dedicated to wells, is washed in a dedicated container prepared with non-phosphate detergent and triple rinsed in a second container prepared with distilled and/or deionized water. Surfaces that cannot be readily submerged for the purpose of decontamination, are sprayed with wash water followed by rinse water, and wiped with a fresh disposable paper towel. For shallow wells that require a peristaltic pump, dedicated tubing is left in each well after sampling, however, for deeper wells that require a submersible pump, dedicated tubing is recovered from wells after each use, and deployed to a designated dedicated clean plastic bag, bearing a label indicating well identification information.

Water Level Measurement

Prior to the well purge process and the collection of groundwater samples, groundwater levels are measured at the north side of the ("TOC") with a piezometer/water level indicator, by slowly lowering the sensor into wells prior to purging, in order to minimize disturbances. The water levels are measured twice, with tape a marked in 0.01 foot increments, in order to reduce possible reading error. Where appropriate, free product thickness is measured with gas level indicator paste or an interface indicator. Upon arrival, each well is visual inspected and the condition of the well and well head are noted.

Groundwater Monitoring Well Purge and Sampling Methodologies

Prior to groundwater sample collection, A dedicated length of high density polyethylene tubing is lowered into each well to a level near the middle of the screened interval. A dedicated length of clean silicone tubing is utilized within the pump mechanism. The wells are purged by means of low flow techniques, during which time groundwater is monitored for physical parameters, including temperature, pH, specific conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP), by means of a multi-parameter device mounted upon a flow cell, until such time as values recorded have stabilized and equilibrium conditions are verified according to State guidelines. This protocol ensures that collected groundwater samples are

representative of in-situ groundwater conditions. Readings are recorded once every 2 to 5 minutes, including water level measurement. The pumping rate shall remain below 1 L/min during monitoring and sampling procedures. This is verified by periodically filling a one-Liter graduated cylinder and recording the rate, adjusting the pump as necessary. The water column within the well should remain within 5% of the static height during the purge and sample process, if this cannot be achieved, the pump rate will be reduced until the water level stabilizes. The following conditions must be met in three consecutive readings prior to sampling:

• pH	+/- 0.1 standard units
• Specific Conductivity	+/- 10.0 mS/cm for values < 1,000 mS/cm
	+/- 20.0 mS/cm for values > 1,000 mS/cm
• DO	+/- 0.05 mg/L for values < 1 mg/L
	+/- 0.2 mg/L for values > 1 mg/L
• Temperature	+/- 0.1 degrees Celcius
• ORP	+/- 10 mV

Groundwater samples are collected in containers specified by the laboratory for the analyses established at the Site, and in accordance with State of Washington regulations or guidelines. Sample containers are labeled with site name, well identification, and date of collection information. Each sample is documented on a *Chain of Custody* (“”COC”) form, and immediately placed in an iced cooler (maintained at 4 degrees Celcius or less) for transport to a certified laboratory for analysis. Please note that any purge water suspected or confirmed to contain concentrations above the MTCA Cleanup Levels is drummed and left on Site.

Appendix D

Photographs

GPR Survey

Storm sewer in the vicinity of B3

View of proposed locations in white marking paint

From left to right, 0-4 feet core sample of B1

From left to right, 4-8 feet core sample of B1

View of Direct Push Rig advancing B3

Appendix E

Terrestrial Ecological Evaluation

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: Federal Way Union, Inc.	
Facility/Site Address: 18015 Bothell Way North East, Bothell, Washington	
Facility/Site No: 35644949	VCP Project No.: TBD

Step 2: IDENTIFY EVALUATOR		
Please identify below the person who conducted the evaluation and their contact information.		
Name: Justin Foslien		Title: Licensed Geologist
Organization: Aerotech Environmental		
Mailing address: 13925 Interurban Avenue South #210		
City: Tukwila	State: WA	Zip code: 98168
Phone: 206 257 4211	Fax: 206 402 3872	E-mail: justin@dirtydirt.us

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2**.*

☒ No or Unknown *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☒ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☐ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☒ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☒ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☒ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

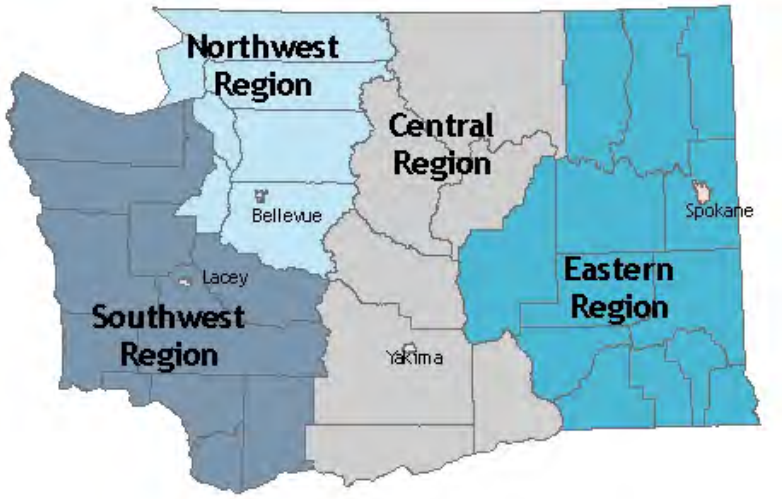
5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

Table 749-1

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	
Area (acres) / Points 0.25 or less / 4 0.5 / 5 1.0 / 6 1.5 / 7 2.0 / 8 2.5 / 9 3.0 / 10 3.5 / 11 4.0 or more / 12	
2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1	
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]

Table 749-2

Priority contaminants of ecological concern for sites that qualify for the simplified terrestrial ecological evaluation[a]

Soil Concentration (mg/kg)		
Priority Contaminant	Unrestricted Land Use[b]	Industrial or Commercial Site
METALS[c]		
Antimony	See Note [d]	See Note [d]
Arsenic III	20 mg/kg	20 mg/kg
Arsenic IV	95 mg/kg	260 mg/kg
Barium	1,250 mg/kg	1,320mg/kg
Beryllium	25 mg/kg	See Note [d]
Cadmium	25 mg/kg	36 mg/kg
Chromium (total)	42 mg/kg	135 mg/kg
Cobalt	See Note [d]	See Note [d]
Copper	100 mg/kg	550 mg/kg
Lead	220 mg/kg	220 mg/kg
Magnesium	See Note [d]	See Note [d]
Manganese	See Note [d]	23,500 mg/kg
Mercury, inorganic	9 mg/kg	9 mg/kg
Mercury, organic	0.7 mg/kg	0.7 mg/kg
Molybdenum	See Note [d]	71 mg/kg
Nickel	100 mg/kg	1,850 mg/kg
Selenium	0.8 mg/kg	0.8 mg/kg
Silver	See Note [d]	See Note [d]
Tin	275 mg/kg	See Note [d]
Vanadium	26 mg/kg	See Note [d]
Zinc	270 mg/kg	570 mg/kg
PESTICIDES		
Aldicarb/aldicarb sulfone (total)	See Note [d]	See Note [d]
Aldrin	0.17 mg/kg	0.17 mg/kg
Benzene hexachloride (including lindane)	10 mg/kg	10 mg/kg

Carbofuran	See Note [d]	See Note [d]
Chlordane	1 mg/kg	7 mg/kg
Chlorpyrifos/chlorpyrifos-methal (total)	See Note [d]	See Note [d]
DDT/DDD/DDE	1 mg/kg	1 mg/kg
Dieldrin	0.17 mg/kg	0.17 mg/kg
Endosulfan	See Note [d]	See Note [d]
Endrin	0.4 mg/kg	0.4 mg/kg
Heptachlor/heptachlor epoxide (total)	0.6 mg/kg	0.6 mg/kg
Hexachlorobenzene	31 mg/kg	31 mg/kg
Parathion/methyl parathion (total)	See Note [d]	See Note [d]
Pentachlorophenol	11 mg/kg	11 mg/kg
Toxaphene	See Note [d]	See Note [d]
OTHER CHLORINATED ORGANICS		
Chlorinated dibenzofurans (total)	3E-06 mg/kg	3E-06 mg/kg
Dioxins	5E-06 mg/kg	5E-06 mg/kg
Hexchlorophene	See Note [d]	See Note [d]
PCB mixtures (total)	2 mg/kg	2 mg/kg
Pentachlorobenzene	168 mg/kg	See Note [d]
OTHER NONCHLORINATED ORGANICS		
Acenaphthene	See Note [d]	See Note [d]
Benzo(a)pyrene	30 mg/kg	300 mg/kg
Bis (2-ethylhexyl) phthalate	See Note [d]	See Note [d]
Di-n-butyl phthalate	200 mg/kg	See Note [d]
PETROLEUM		
Gasoline Range Organics	200 mg/kg	12,000 mg/kg except that the concentration shall not exceed residual saturation at the soil surface.
Diesel Range Organics Common examples of diesel range organics include: Diesel #2, Fuel Oil #2, and light oil including some bunker oils. Refer to Table 830-1	460 mg/kg	15,000 mg/kg except that the concentration shall not exceed residual saturation at the soil surface.

Table 749-2 Notes

[a] Caution on misusing these chemical concentration numbers. These values have been developed for use at sites where a site-specific terrestrial ecological evaluation is not required. They are not intended to be protective of terrestrial ecological receptors at every site. Exceedances of the values in this table do not necessarily trigger requirements for cleanup action under this chapter. The table is not intended for purposes such as evaluating sludges or wastes.

This list does not imply that sampling must be conducted for each of these chemicals at every site. Sampling should be conducted for those chemicals that might be present based on available information, such as current and past uses of chemicals at the site.

[b] Applies to any site that does not meet the definition of industrial or commercial.

[c] For arsenic, use the valence state most likely to be appropriate for site conditions, unless laboratory information is available. Where soil conditions alternate between saturated, anaerobic and unsaturated, aerobic states, resulting in the alternating presence of arsenic III and arsenic V, the arsenic III concentrations shall apply.

[d] Safe concentration has not yet been established.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [TEE Table 749-2] [TEE Table 749-3] [TEE Table 749-4] [TEE Table 749-5] [TEE Table 830-1]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]

Table 749-3

Ecological Indicator Soil Concentrations (mg/kg) for Protection of Terrestrial Plants and Animals[a]. For chemicals where a value is not provided, see footnote [b].

Note: These values represent soil concentrations that are expected to be protective at any MTCA site and are provided for use in eliminating hazardous substances from further consideration under WAC 173-340-7493 (2)(a)(i). Where these values are exceeded, various options are provided for demonstrating that the hazardous substance does not pose a threat to ecological receptors at a site, or for developing site-specific remedial standards for eliminating threats to ecological receptors. See WAC 173-340-7493 (1)(b)(i), 173-340-7493 (2)(a)(ii) and 173-340-7493(3).

Hazardous Substance[b]	Plants[c]	Soil biota[d]	Wildlife[e]
METALS[f]			
Aluminum (soluble salts)	50		
Antimony	5		
Arsenic III			7
Arsenic V	10	60	132
Barium	500		102
Beryllium	10		
Boron	0.5		
Bromine	10		
Cadmium	4	20	14
Chromium (total)	42[g]	42[g]	67
Cobalt	20		
Copper	100	50	217
Fluorine	200		
Iodine	4		
Lead	50	500	118
Lithium	35[g]		
Manganese	1,100[g]		1,500
Mercury, Inorganic	0.3	0.1	5.5
Mercury, Organic			0.4
Molybdenum	2		7
Nickel	30	200	980
Selenium	1	70	0.3
Silver	2		

Technetium	0.2		
Thallium	1		
Tin	50		
Uranium	5		
Vanadium	2		
Zinc	86[g]	200	360
PESTICIDES			
Aldrin			0.1
Benzene hexachloride (including lindane)			6
Chlordane		1	2.7
DDT/DDD/DDE (total)			0.75
Dieldrin			0.07
Endrin			0.2
Hexachlorobenzene			17
Heptachlor/heptachlor epoxide (total)			0.4
Pentachlorophenol	3	6	4.5
OTHER CHLORINATED ORGANICS			
1,2,3,4-Tetrachlorobenzene		10	
1, 2,3-Trichlorobenzene		20	
1,2,4-Trichlorobenzene		20	
1,2-Dichloropropane		700	
1,4-Dichlorobenzene		20	
2,3,4,5-Tetrachlorophenol		20	
2,3,5,6-Tetrachloroaniline	20	20	
2,4,5-Trichloroaniline	20	20	
2,4,5-Trichlorophenol	4	9	
2,4,6-Trichlorophenol		10	
2,4-Dichloroaniline		100	
3,4-Dichloroaniline		20	
3,4-Dichlorophenol	20	20	
3-Chloroaniline	20	30	
3-Chlorophenol	7	10	
Chlorinated dibenzofurans (total)			2E-06
Chloroacetamide		2	
Chlorobenzene		40	
Dioxins			2E-06

Hexachlorocyclopentadiene	10		
PCB mixtures (total)	40		0.65
Pentachloroaniline		100	
Pentachlorobenzene		20	
OTHER NONCHLORINATED ORGANICS			
2,4-Dinitrophenol	20		
4-Nitrophenol		7	
Acenaphthene	20		
Benzo(a)pyrene			12
Biphenyl	60		
Diethylphthalate	100		
Dimethylphthalate		200	
Di-n-butyl phthalate	200		
Fluorene		30	
Furan	600		
Nitrobenzene		40	
N-nitrosodiphenylamine		20	
Phenol	70	30	
Styrene	300		
Toluene	200		
PETROLEUM			
Gasoline Range Organics		100	5,000 mg/kg except that the concentration shall not exceed residual saturation at the soil surface.
Diesel Range Organics		200	6,000 except that the concentration shall not exceed residual saturation at the soil surface.

Table 749-3 Notes

[a] Caution on misusing ecological indicator concentrations. Exceedances of the values in this table do not necessarily trigger requirements for cleanup action under this chapter. Natural

background concentrations may be substituted for ecological indicator concentrations provided in this table. The table is not intended for purposes such as evaluating sludges or wastes.

This list does not imply that sampling must be conducted for each of these chemicals at every site. Sampling should be conducted for those chemicals that might be present based on available information, such as current and past uses of chemicals at the site.

[b] For hazardous substances where a value is not provided, plant and soil biota indicator concentrations shall be based on a literature survey conducted in accordance with WAC 173-340-7493(4) and calculated using methods described in the publications listed below in footnotes c and d. Methods to be used for developing wildlife indicator concentrations are described in Tables 749-4 and 749-5.

[c] Based on benchmarks published in *Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Terrestrial Plants: 1997 revision*, Oak Ridge National Laboratory, 1997.

[d] Based on benchmarks published in *Toxicological Benchmarks for Potential Contaminants of Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process*, Oak Ridge National Laboratory, 1997.

[e] Calculated using the exposure model provided in Table 749-4 and chemical-specific values provided in Table 749-5. Where both avian and mammalian values are available, the wildlife value is the lower of the two.

[f] For arsenic, use the valence state most likely to be appropriate for site conditions, unless laboratory information is available. Where soil conditions alternate between saturated, anaerobic and unsaturated, aerobic states, resulting in the alternating presence of arsenic III and arsenic V, the arsenic III concentrations shall apply.

[g] Benchmark replaced by Washington state natural background concentration.

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493] [Index of Tables]

[TEE Home]

EXPLANATION

Subject Property

500-foot Radius of Subject Site

Contiguous Undeveloped Land
4.3 Acres

AEROTECH
ENVIRONMENTAL CONSULTING

TERRESTRIAL ECOLOGICAL EVALUATION
500-FEET RADIUS MAP

Bothell 76
18015 Bothell Way Northeast
Bothell, Washington

0 250 500
SCALE (feet)

Date: 10/18/17
By: Nick Gerkin
Figure: Appendix B

Appendix F

Stockpile Sample Tables – GeoEngineers 1992

TABLE 3A (Page 1 of 3)
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
CONTAMINATED SOIL STOCKPILES

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[4] (mg/kg)
		B	E	T	X			
Samples obtained from soil stockpiles disposed of at Roosevelt Regional Landfill								
SP-1(A)	02/26/91	--	--	--	--	ND, --	ND, --	180
SP-1(B)	05/15/91	ND	ND	ND	ND	ND, --	ND, --	44
WOSP-1	05/17/91	ND	ND	ND	ND	ND, --	12, --	130
OSPN-1	10/02/91	--	--	--	--	--, --	--, --	400
OSPN-2	10/02/91	--	--	--	--	--, --	--, --	400
OSPN-3	10/03/91	--	--	--	--	--, --	--, --	500
OSPN-4	10/03/91	--	--	--	--	--, --	--, --	270
OSPN-5	10/09/91	--	--	--	--	--, --	--, --	530
OSPN-6	10/09/91	--	--	--	--	--, --	--, --	850
OSPN-7	10/09/91	--	--	--	--	--, --	--, --	750
OSPN-8	10/09/91	--	--	--	--	--, --	--, --	65
OSPN-9	10/09/91	--	--	--	--	--, --	--, --	880
OSPN-10	10/10/91	--	--	--	--	--, --	--, --	2,700
OSPN-11	10/10/91	--	--	--	--	--, --	--, --	190
OSPN-12	10/10/91	--	--	--	--	--, --	--, --	870
OSPN-13	10/10/91	--	--	--	--	--, --	--, --	1,600
OSPN-14(A)	12/02/91	--	--	--	--	--, --	--, 280	--
OSPN-14(B)	02/12/92	ND	0.060	0.13	0.33	ND, --	ND, --	130
OSPN-15(A)	12/02/91	ND	ND	ND	ND	--, --	--, 350	--
OSPN-15(B)	12/13/91	ND	ND	ND	0.071	130, --	73, --	270
OSPN-16	12/02/91	--	--	--	--	--, --	--, 480	--
OSPN-17	12/02/91	--	--	--	--	--, --	--, 1,600	--
MTCA Method A Soil Cleanup Level		0.5	20	40	20	100	200	200

Notes appear on page 3 of 3.

TABLE 3A (Page 2 of 3)

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[4] (mg/kg)
		B	E	T	X			
OSPN-18	12/02/91	--	--	--	--	--, --	--, 170	--
OSPN-19	12/02/91	--	--	--	--	--, --	--, 400	--
OSPN-20	12/02/91	--	--	--	--	--, --	--, 49	--
OSPN-21	12/02/91	--	--	--	--	--, --	--, --	--
T-1	10/08/91	--	--	--	--	2,000, --	23,000, --	--
RSP-1	02/12/92	--	--	--	--	--, --	--, --	54
RSP-2	02/12/92	--	--	--	--	ND, --	ND, --	200
CNSP-6	02/14/92	ND	ND	ND	ND	ND, ND	ND, --	200
PISP-1	02/13/92	ND	ND	ND	ND	10, 12	37, --	--
PISP-2	02/14/92	ND	ND	ND	ND	ND, 13	ND, --	--
PISP-3	02/14/92	ND	0.060	ND	0.20	890, 1,800	760, --	--
PISP-4	02/17/92	ND	ND	ND	ND	10, 9	38, --	--
Samples obtained from gasoline-contaminated soil stockpiles prior to treatment								
DSP-1	05/17/91	ND	1.3	0.61	9.9	52, 230	ND, --	--
DSP-2	05/17/91	ND	0.33	0.36	1.1	34, 32	ND, --	--
DSP-3	05/17/91	0.13	0.94	2.3	5.8	62, 120	ND, --	--
GSPN-1	09/30/91	0.16	5.7	7.8	54	930, --	ND, --	--
GSPN-2	10/01/91	ND	0.036	0.11	0.44	8, --	ND, --	--
GSPN-3	10/01/91	ND	0.10	0.088	2.0	24, --	7, --	--
GSPN-4	10/01/91	0.13	1.8	3.1	14	180, --	22, --	--
GSPN-5	10/01/91	ND	0.052	0.057	0.63	21, --	7, --	--
Samples obtained from gasoline-contaminated soil stockpiles after treatment								
GSPN-6	01/07/91	ND	0.18	0.15	2.9	74, 100	31, --	--
GSPN-7	01/07/91	ND	ND	ND	ND	ND, ND	ND, --	--
GSPN-8	01/07/91	ND	ND	ND	ND	ND, ND	8, --	--
GSPN-9	01/07/91	ND	ND	ND	ND	11, ND	15, --	--
MTCA Method A Soil Cleanup Level		0.5	20	40	20	100	200	200

Notes appear on page 3 of 3.

TABLE 3A (Page 3 of 3)

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[4] (mg/kg)
		B	E	T	X			
GSPN-10	10/07/91	ND	ND	ND	0.20	10, 7	7, –	–
GSPN-11	10/07/91	ND	ND	ND	ND	14, 16	13, –	–
GSPO-1	10/03/91	ND	0.35	ND	0.48	9, –	ND, –	–
GSPO-2	10/03/91	ND	ND	ND	0.030	ND, –	ND, –	–
GSPO-3	10/03/91	ND	ND	ND	0.18	33, –	79, –	–
GSPO-4	10/03/91	ND	ND	ND	ND	10, –	ND, –	–
GSPO-5	10/03/91	ND	ND	ND	ND	20, –	ND, –	–
GSPO-6	10/03/91	ND	ND	ND	ND	ND, –	ND, –	–
MTCA Method A Soil Cleanup Level		0.5	20	40	20	100	200	200

Notes:

[1]B = benzene, E = ethylbenzene, T = toluene, X = xylenes. BETX was analyzed by EPA Method 8020.

[2]Gasoline-range hydrocarbons were quantified using two different modifications of EPA Method 8015. The first value in each pair was obtained using sonication or vortex extraction techniques. The second value was obtained using Ecology-specified Method WTPH-G, except for samples DSP-1, DSP-2 and DSP-3 which were obtained using a purge-and-trap extraction technique.

[3]Diesel-range hydrocarbons were quantified using two different modifications of EPA Method 8015. The first value in each pair was obtained using sonication or vortex extraction techniques. The second value was obtained using Ecology-specified Method WTPH-D.

[4]Heavier hydrocarbons were quantified using EPA Method 418.1.

mg/kg = milligrams per kilogram; ND = not detected. See laboratory reports for specific detection limits; "–" = not tested

TABLE 3B
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
CONTAMINATED SOIL STOCKPILES

Analysis	Units	Sample Number												
		SP-1(B)[1]	WOSP-1	GSPN-1	OSPN-1	OSPN-2	OSPN-3	OSPN-6	OSPN-9	OSPN-15(A)	OSPN-16	OSPN-21[2]	OSPN-14(B)	OSPN-15(B)
HVOCs[3] (by EPA Method 8010)	mg/kg	ND	ND	--	--	--								
Methylene chloride							0.15[4]	0.24[5]	0.28[5]	0.14[6]	0.18[6]	--	ND	0.78[7]
Tetrachloroethene							ND	ND	ND	ND	0.028			ND
PCBs[8] and Organochlorinated Pesticides	mg/kg		--	--	--				ND			ND	ND	
(by EPA Method 8080)														
PCB, 1254		ND				0.19	0.20	0.41		0.050	0.043			
4,4'-DDD		0.14				ND	ND	ND		ND	ND			
Dieldrin		0.03				ND	ND	ND		ND	ND			
Endrin		0.02				ND	ND	ND		ND	ND			
Semivolatile Organics	mg/kg	--	--	--				ND		--	--	--	--	--
(by EPA Method 8270)														
Bis(2-ethylhexyl)phthalate					0.18[10]	0.18[10]	0.12[10]		ND					
Phenanthrene					ND	ND	ND		0.13					
TCLP Extraction[9]	mg/l	--	--	--	--	--	--	--	--	ND	ND	ND	--	
Total Lead (by EPA Method 7420)	mg/kg	--	--	ND	--	--	--	--	--	--	--	--	--	--
TCLP Metals[3]	mg/kg		--	--	--								--	
(by EPA 7000 series methodology)														
Barium		0.6				0.56	0.54	0.48	0.47	0.53	0.53	0.54		
Mercury		0.011				ND	ND	ND	ND	ND	ND	ND		

Notes:

[1]Sample SP-1 was also analyzed for flash point by ASTM Method D-93. The sample had a flash point greater than 200 degrees Fahrenheit.

[2]A fish bioassay was also performed on sample OSPN-21 following Washington State Department of Ecology guidelines stated in 'Biological Testing Methods Static. Acute Fish Toxicity Test,' DOE 80-12. The result of the analysis was 0% fish mortality rate.

[3]HVOCs = halogenated volatile organic compounds

[4]A concentration of 0.072 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination.

[5]A concentration of 0.18 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination.

[6]A concentration of 0.05 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination.

[7]A concentration of 0.22 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination, significantly less than the analyte detected in sample OSPN-15.

[8]PCBs = polychlorinated biphenyls

[9]TCLP = toxic characteristics leaching procedure extraction techniques

[10]A concentration of 0.097 mg/kg bis (2-ethylhexyl) phthalate was detected on the reagent blank, indicating laboratory cross-contamination.

mg/kg = milligrams per kilogram; mg/l = milligrams per liter; '--' = not analyzed; ND = analyte not detected. See laboratory reports for specific detection limits.

TABLE 6
SUMMARY OF SOIL ANALYTICAL DATA
NONCONTAMINATED SOIL STOCKPILES

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[5] (mg/kg)
		B	E	T	X			
CSP-1	05/16/91	ND	ND	ND	ND	ND, ND	ND	–
CSP-2	05/16/91	ND	ND	ND	ND	ND, ND	ND	–
CSP-A/B	09/30/91	–	–	–	–	–, –	–	46
CSP-C/D	09/30/91	–	–	–	–	ND, –	ND	35
CSP-E/F	09/30/91	–	–	–	–	–, –	–	18
CSP-G/H	09/30/91	–	–	–	–	ND, –	ND	60
CSP-I/J	09/30/91	–	–	–	–	–, –	–	32
CSP-K/L	09/30/91	–	–	–	–	ND, –	ND	35
CSP-7	10/01/91	–	–	–	–	–, –	–	27
CNSP-1	02/11/92	–	–	–	–	ND, –	ND	ND
CNSP-2	02/11/92	–	–	–	–	ND, –	ND	ND
CNSP-3	02/11/92	–	–	–	–	ND, –	41	ND
CNSP-4	02/12/92	–	–	–	–	ND, –	ND	ND
CNSP-5	02/12/92	–	–	–	–	ND, –	ND	ND

Notes:

[1]B = benzene, E = ethylbenzene, T - toluene, X = xylenes. Samples were analyzed for BETX by EPA Method 8020.

[2]Gasoline-range hydrocarbons were quantified using two different modifications of EPA Method 8015. The first value in each pair was obtained using a sonication or vortex extraction technique. The second value was obtained using a purge-and-trap extraction technique. The larger of the two values is reported in the text.

[3]Diesel-range hydrocarbons were quantified using modified EPA Method 8015.

[4]Heavier hydrocarbons were quantified using EPA Method 418.1.

mg/kg = milligrams per kilogram

ND = not detected. See laboratory reports for specific detection limits.

'–' = not tested

Appendix G

Groundwater Potentiometric Surface Maps –GeoEngineers 1990, 1992, 1993

TABLE 3A (Page 1 of 3)
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
CONTAMINATED SOIL STOCKPILES

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[4] (mg/kg)
		B	E	T	X			
Samples obtained from soil stockpiles disposed of at Roosevelt Regional Landfill								
SP-1(A)	02/26/91	--	--	--	--	ND, --	ND, --	180
SP-1(B)	05/15/91	ND	ND	ND	ND	ND, --	ND, --	44
WOSP-1	05/17/91	ND	ND	ND	ND	ND, --	12, --	130
OSPN-1	10/02/91	--	--	--	--	--, --	--, --	400
OSPN-2	10/02/91	--	--	--	--	--, --	--, --	400
OSPN-3	10/03/91	--	--	--	--	--, --	--, --	500
OSPN-4	10/03/91	--	--	--	--	--, --	--, --	270
OSPN-5	10/09/91	--	--	--	--	--, --	--, --	530
OSPN-6	10/09/91	--	--	--	--	--, --	--, --	850
OSPN-7	10/09/91	--	--	--	--	--, --	--, --	750
OSPN-8	10/09/91	--	--	--	--	--, --	--, --	65
OSPN-9	10/09/91	--	--	--	--	--, --	--, --	880
OSPN-10	10/10/91	--	--	--	--	--, --	--, --	2,700
OSPN-11	10/10/91	--	--	--	--	--, --	--, --	190
OSPN-12	10/10/91	--	--	--	--	--, --	--, --	870
OSPN-13	10/10/91	--	--	--	--	--, --	--, --	1,600
OSPN-14(A)	12/02/91	--	--	--	--	--, --	--, 280	--
OSPN-14(B)	02/12/92	ND	0.060	0.13	0.33	ND, --	ND, --	130
OSPN-15(A)	12/02/91	ND	ND	ND	ND	--, --	--, 350	--
OSPN-15(B)	12/13/91	ND	ND	ND	0.071	130, --	73, --	270
OSPN-16	12/02/91	--	--	--	--	--, --	--, 480	--
OSPN-17	12/02/91	--	--	--	--	--, --	--, 1,600	--
MTCA Method A Soil Cleanup Level		0.5	20	40	20	100	200	200

Notes appear on page 3 of 3.

TABLE 3A (Page 2 of 3)

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[4] (mg/kg)
		B	E	T	X			
OSPN-18	12/02/91	--	--	--	--	--, --	--, 170	--
OSPN-19	12/02/91	--	--	--	--	--, --	--, 400	--
OSPN-20	12/02/91	--	--	--	--	--, --	--, 49	--
OSPN-21	12/02/91	--	--	--	--	--, --	--, --	--
T-1	10/08/91	--	--	--	--	2,000, --	23,000, --	--
RSP-1	02/12/92	--	--	--	--	--, --	--, --	54
RSP-2	02/12/92	--	--	--	--	ND, --	ND, --	200
CNSP-6	02/14/92	ND	ND	ND	ND	ND, ND	ND, --	200
PISP-1	02/13/92	ND	ND	ND	ND	10, 12	37, --	--
PISP-2	02/14/92	ND	ND	ND	ND	ND, 13	ND, --	--
PISP-3	02/14/92	ND	0.060	ND	0.20	890, 1,800	760, --	--
PISP-4	02/17/92	ND	ND	ND	ND	10, 9	38, --	--
Samples obtained from gasoline-contaminated soil stockpiles prior to treatment								
DSP-1	05/17/91	ND	1.3	0.61	9.9	52, 230	ND, --	--
DSP-2	05/17/91	ND	0.33	0.36	1.1	34, 32	ND, --	--
DSP-3	05/17/91	0.13	0.94	2.3	5.8	62, 120	ND, --	--
GSPN-1	09/30/91	0.16	5.7	7.8	54	930, --	ND, --	--
GSPN-2	10/01/91	ND	0.036	0.11	0.44	8, --	ND, --	--
GSPN-3	10/01/91	ND	0.10	0.088	2.0	24, --	7, --	--
GSPN-4	10/01/91	0.13	1.8	3.1	14	180, --	22, --	--
GSPN-5	10/01/91	ND	0.052	0.057	0.63	21, --	7, --	--
Samples obtained from gasoline-contaminated soil stockpiles after treatment								
GSPN-6	01/07/91	ND	0.18	0.15	2.9	74, 100	31, --	--
GSPN-7	01/07/91	ND	ND	ND	ND	ND, ND	ND, --	--
GSPN-8	01/07/91	ND	ND	ND	ND	ND, ND	8, --	--
GSPN-9	01/07/91	ND	ND	ND	ND	11, ND	15, --	--
MTCA Method A Soil Cleanup Level		0.5	20	40	20	100	200	200

Notes appear on page 3 of 3.

TABLE 3A (Page 3 of 3)

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[4] (mg/kg)
		B	E	T	X			
GSPN-10	10/07/91	ND	ND	ND	0.20	10, 7	7, –	–
GSPN-11	10/07/91	ND	ND	ND	ND	14, 16	13, –	–
GSPO-1	10/03/91	ND	0.35	ND	0.48	9, –	ND, –	–
GSPO-2	10/03/91	ND	ND	ND	0.030	ND, –	ND, –	–
GSPO-3	10/03/91	ND	ND	ND	0.18	33, –	79, –	–
GSPO-4	10/03/91	ND	ND	ND	ND	10, –	ND, –	–
GSPO-5	10/03/91	ND	ND	ND	ND	20, –	ND, –	–
GSPO-6	10/03/91	ND	ND	ND	ND	ND, –	ND, –	–
MTCA Method A Soil Cleanup Level		0.5	20	40	20	100	200	200

Notes:

[1]B = benzene, E = ethylbenzene, T = toluene, X = xylenes. BETX was analyzed by EPA Method 8020.

[2]Gasoline-range hydrocarbons were quantified using two different modifications of EPA Method 8015. The first value in each pair was obtained using sonication or vortex extraction techniques. The second value was obtained using Ecology-specified Method WTPH-G, except for samples DSP-1, DSP-2 and DSP-3 which were obtained using a purge-and-trap extraction technique.

[3]Diesel-range hydrocarbons were quantified using two different modifications of EPA Method 8015. The first value in each pair was obtained using sonication or vortex extraction techniques. The second value was obtained using Ecology-specified Method WTPH-D.

[4]Heavier hydrocarbons were quantified using EPA Method 418.1.

mg/kg = milligrams per kilogram; ND = not detected. See laboratory reports for specific detection limits; "–" = not tested

TABLE 3B
SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA
CONTAMINATED SOIL STOCKPILES

Analysis	Units	Sample Number												
		SP-1(B)[1]	WOSP-1	GSPN-1	OSPN-1	OSPN-2	OSPN-3	OSPN-6	OSPN-9	OSPN-15(A)	OSPN-16	OSPN-21[2]	OSPN-14(B)	OSPN-15(B)
HVOCs[3] (by EPA Method 8010)	mg/kg	ND	ND	--	--	--								
Methylene chloride							0.15[4]	0.24[5]	0.28[5]	0.14[6]	0.18[6]	--	ND	0.78[7]
Tetrachloroethene							ND	ND	ND	ND	0.028			ND
PCBs[8] and Organochlorinated Pesticides	mg/kg		--	--	--				ND			ND	ND	
(by EPA Method 8080)														
PCB, 1254		ND				0.19	0.20	0.41		0.050	0.043			
4,4'-DDD		0.14				ND	ND	ND		ND	ND			
Dieldrin		0.03				ND	ND	ND		ND	ND			
Endrin		0.02				ND	ND	ND		ND	ND			
Semivolatile Organics	mg/kg	--	--	--				ND		--	--	--	--	--
(by EPA Method 8270)														
Bis(2-ethylhexyl)phthalate					0.18[10]	0.18[10]	0.12[10]		ND					
Phenanthrene					ND	ND	ND		0.13					
TCLP Extraction[9]	mg/l	--	--	--	--	--	--	--	--	ND	ND	ND	--	
Total Lead (by EPA Method 7420)	mg/kg	--	--	ND	--	--	--	--	--	--	--	--	--	--
TCLP Metals[3]	mg/kg		--	--	--								--	
(by EPA 7000 series methodology)														
Barium		0.6				0.56	0.54	0.48	0.47	0.53	0.53	0.54		
Mercury		0.011				ND	ND	ND	ND	ND	ND	ND		

Notes:

[1]Sample SP-1 was also analyzed for flash point by ASTM Method D-93. The sample had a flash point greater than 200 degrees Fahrenheit.

[2]A fish bioassay was also performed on sample OSPN-21 following Washington State Department of Ecology guidelines stated in 'Biological Testing Methods Static. Acute Fish Toxicity Test,' DOE 80-12. The result of the analysis was 0% fish mortality rate.

[3]HVOCs = halogenated volatile organic compounds

[4]A concentration of 0.072 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination.

[5]A concentration of 0.18 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination.

[6]A concentration of 0.05 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination.

[7]A concentration of 0.22 mg/kg methylene chloride was detected in the reagent blank, indicating laboratory cross-contamination, significantly less than the analyte detected in sample OSPN-15.

[8]PCBs = polychlorinated biphenyls

[9]TCLP = toxic characteristics leaching procedure extraction techniques

[10]A concentration of 0.097 mg/kg bis (2-ethylhexyl) phthalate was detected on the reagent blank, indicating laboratory cross-contamination.

mg/kg = milligrams per kilogram; mg/l = milligrams per liter; '--' = not analyzed; ND = analyte not detected. See laboratory reports for specific detection limits.

TABLE 6
SUMMARY OF SOIL ANALYTICAL DATA
NONCONTAMINATED SOIL STOCKPILES

Sample Number	Date Sampled	BETX[1] (mg/kg)				Gasoline-range Hydrocarbons[2] (mg/kg)	Diesel-range Hydrocarbons[3] (mg/kg)	Heavier Hydrocarbons[5] (mg/kg)
		B	E	T	X			
CSP-1	05/16/91	ND	ND	ND	ND	ND, ND	ND	–
CSP-2	05/16/91	ND	ND	ND	ND	ND, ND	ND	–
CSP-A/B	09/30/91	–	–	–	–	–, –	–	46
CSP-C/D	09/30/91	–	–	–	–	ND, –	ND	35
CSP-E/F	09/30/91	–	–	–	–	–, –	–	18
CSP-G/H	09/30/91	–	–	–	–	ND, –	ND	60
CSP-I/J	09/30/91	–	–	–	–	–, –	–	32
CSP-K/L	09/30/91	–	–	–	–	ND, –	ND	35
CSP-7	10/01/91	–	–	–	–	–, –	–	27
CNSP-1	02/11/92	–	–	–	–	ND, –	ND	ND
CNSP-2	02/11/92	–	–	–	–	ND, –	ND	ND
CNSP-3	02/11/92	–	–	–	–	ND, –	41	ND
CNSP-4	02/12/92	–	–	–	–	ND, –	ND	ND
CNSP-5	02/12/92	–	–	–	–	ND, –	ND	ND

Notes:

[1]B = benzene, E = ethylbenzene, T - toluene, X = xylenes. Samples were analyzed for BETX by EPA Method 8020.

[2]Gasoline-range hydrocarbons were quantified using two different modifications of EPA Method 8015. The first value in each pair was obtained using a sonication or vortex extraction technique. The second value was obtained using a purge-and-trap extraction technique. The larger of the two values is reported in the text.

[3]Diesel-range hydrocarbons were quantified using modified EPA Method 8015.

[4]Heavier hydrocarbons were quantified using EPA Method 418.1.

mg/kg = milligrams per kilogram

ND = not detected. See laboratory reports for specific detection limits.

'–' = not tested