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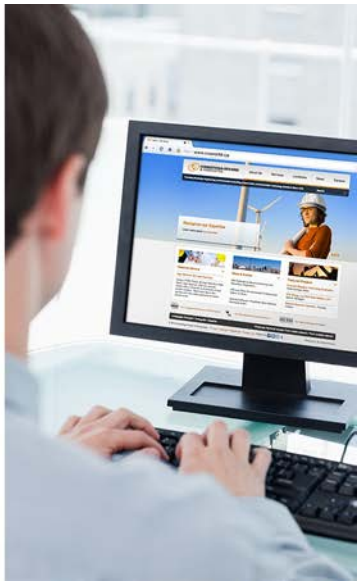

Remedial Investigation and Feasibility Study Work Plan

Phillips 66/Former Tidewater Site
2800 Mlk Jr Way S.
Seattle, Washington

Prepared for: Phillips 66 Company

Conestoga-Rovers & Associates
20818 44th Ave. West, Suite 190
Lynnwood, Washington 98036

December 2, 2013 • 061992 • Report No. 4

Partners in Sustainability

Remedial Investigation and Feasibility Study Work Plan

Phillips 66/Former Tidewater Site
2800 Mlk Jr Way S.
Seattle, Washington

Phillips 66 Site No. **05173**
Chevron Site No. **301233**

Prepared by/for:

Phillips 66 Company

Matthew Davis, LG

Ed Turner, LG

Prepared by:
Conestoga-Rovers & Associates

20818 44th Avenue West
Suite 190
Lynnwood, Washington
U.S.A. 98036

Office: 425-563-6500
Fax: 425-563-6599

web: http://www.CRAworld.com

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Section 1.0 Introduction

1.1 Site Information

Site Name	Phillips 66 070644/Former Tidewater Site
Site Address	2800 MLK Jr. Way S., Seattle, WA
Voluntary Cleanup Program Number	NW2321
Project Consultant	Conestoga-Rovers & Associates
Project Consultant Contact Information	Edwin Turner 20818 44th Avenue West, Suite 190 Lynnwood, Washington 98036 Office – (425) 563-6500 Direct – (425) 563-6519
Current Owner/Operator	Hooe Holdings, LLC

1.2 Purpose

Conestoga-Rovers & Associates (CRA) prepared this Remedial Investigation and Feasibility Study (RI/FS) work plan on behalf of the Phillips 66 Company (P66) and Chevron Environmental Management Company (CEMC) for the Phillips 66 070644/Former Tidewater service station site (Site). The Site includes all areas where hazardous substances associated with the former service station have come to be located. The former service station was located at 2800 MLK Jr. Way South, Seattle, King County, Washington (Property; Figure 1).

This RI/FS work plan was prepared to satisfy the Washington Model Toxics Control Act (WAC 173-340; MTCA) and its implementing regulations, including Washington Administrative Code (WAC) 173-340-350, and consists of a work plan to complete the remedial investigation and feasibility study for the Site. The contents of this RI/FS work plan are based on historical Site investigations and documents prepared by CRA and previous consultants.

Section 2.0 Site Identification and Description

2.1 Site Discovery and Regulatory Status

A petroleum release to the subsurface was reported to Ecology on August 12, 2005, and the Property was listed with the Washington Department of Ecology (Ecology) leaking underground storage tank (LUST) program (ID #2796). The Property was entered into Ecology's Voluntary Cleanup Program (VCP) in 2007 (ID NW1834) and was terminated from the program in February 2010. The Property was

re-entered into the VCP in August 2010 (ID NW2321) and terminated from the program in May 2012. The property was re-entered into the VCP in July 2012 (ID NW2612). The current status with Ecology is "Cleanup Started" for soil and groundwater.

MTCA Method A cleanup levels (CULs) for soil and groundwater will be used as screening levels (SLs) for purposes of discussion of investigation results. Final CULs will be developed as a component of the FS preparation or Draft Cleanup Action Plan (CAP).

2.2 Site and Property Location/Definition

An auto detailing facility currently operates at the Property. King County Assessor Property information and a chronological list of Property operations is included in Appendix A. The Site is depicted on Figure 2.

2.3 Neighborhood Setting

The Property and parcels immediately surrounding the Property are zoned "Neighborhood Commercial". Beyond the immediate parcels, surrounding properties are zoned "residential" to the east and "commercial" to the west. Planned use for the Property is uncertain; however, due to its location and zoning, it will likely continue as a commercial-use Property. Currently, the Property is occupied by an auto detailing business. Various commercial and residential properties are present immediately to the east, south and north of the Property. Southeast of the Property is single-family residential housing. West of the Property, across MLK Jr. Way South, is a 76-branded gas station (Figure 3). The nearest surface water body is Lake Washington approximately 0.5 mile east of the Property.

2.4 Physiographic Setting/Topography

The Property is located at approximately 65 feet above mean sea level (msl). The local topography slopes to the west towards the center of the Rainier Valley.

Surface cover at the Property is primarily asphalt and gravel. Drinking water for the City of Seattle is supplied by the Seattle Public Utilities, sourced primarily from the Tolt River and Cedar River Watersheds.

2.5 Past and Current Property Uses and Facilities

Based on the report, *Phase I Environmental Site Assessment* (G-Logics, 2005), the Property was undeveloped until 1955. The Property was developed into a gasoline service station in 1955 and has been occupied by the following:

- 1955 to 1965 – Associated Oil Company-Associates Gas Station (Merged with Tidewater Oil Company)
- 1965 to 1967 – Phillips Gas Station
- 1967 to 1973 – Rainier Bonanza Self-Serve Gas
- 1974 to 1986 – vacant
- 1986 to 1990 – Empire Mobil
- 1994 to 1996 – R&R Auto Repair
- 1996 to 2004 – C&K Auto Repair
- 2004 to 2010 – vacant auto repair garage
- 2010 to present – auto detailing

Fueling and service-related improvements on the Property have consisted of one 4,000-gallon gasoline UST, one 5,000-gallon gasoline UST, one 300-gallon waste oil UST, one 500-gallon heating oil UST, two pump islands, two underground hydraulic hoists, and a single bay garage.

The two gasoline USTs, the waste oil UST and one pump island were removed from the Property in 1989. The remaining facilities except the garage were removed in 2005.

2.6 Potential Sources of Contamination from Neighboring Properties

Based on a search of Ecology's online facility site database (accessed February 7, 2013), there are no LUST facilities located within the vicinity of the Property. A 76-branded gas station and a Chevron gas station are located west of the Property but do not have any documented releases. Any potential releases from these properties would not likely be a source of contamination on the Property since they are located cross-gradient.

Concentrations of chlorinated solvents in groundwater have been detected in wells at the Property. A dry cleaner located northeast and up-gradient of the Property, has operated since the 1940's. The dry cleaner was listed as a State Cleanup Site in Ecology's online facility site database on December 7, 2010, under the name Mount Baker Cleaners Site. Due to the proximity of the cleaners to the Property and immediate hydraulically up-gradient location, it is very likely that the source of the chlorinated solvents observed in groundwater at the Property is the Mount Baker Cleaners Site.

Section 3.0 Natural Conditions

3.1 Geology

The Site is situated in the Rainier Valley at an elevation of approximately 65 feet above (msl). The Site is underlain by at least 25 feet of moderately dense silty sands and sandy silts with varying amounts of gravel and clay, characteristic of weathered glacial till. The maximum depth explored at the Site is 25 feet below ground surface (bgs). The lithology at the Site is mapped as Vashon till (Waldron et al., 1962).

3.2 Groundwater

The Site is located in the Puget-Willamette Trough lowland regional aquifer between the Cascade and Olympic Mountain ranges in Washington. Based on a search of well logs publicly available through the Ecology database, there are no drinking water supply wells within 0.25 mile of the Site.

Shallow groundwater beneath the Site is present within a perched water bearing zone consisting of unconsolidated sediments/weathered till on top of consolidated glacial till material. This shallow groundwater is not currently used for drinking water. Groundwater depth has been historically measured between 9.5 and 13.5 feet bgs in Site monitoring wells, with an average depth to water of approximately 11.4 feet bgs. The bottom of the water bearing zone was not encountered during any investigation activities to the maximum explored depth of 25 feet bgs. Based on groundwater monitoring results thus far, depth to groundwater at the Site is generally consistent over time. Seasonal fluctuations at the Site are typical for the local region, with higher groundwater elevations in the winter and spring and lower groundwater elevations in summer and fall. Groundwater flow is to the southwest, which is consistent with regional topography. The groundwater gradient has been approximately 0.03 to 0.04 foot per foot since January 2012. Table 2 presents historical groundwater elevations for all Site wells.

3.3 Surface Water

Surface waters near the Site include Lake Washington, approximately 0.5 mile east. Based on an August 2011 publicly available satellite photo, the Beacon Hill Reservoir located approximately 0.75 mile to the southwest is no longer in service, though it is depicted as a surface water body in Figure 1.

3.4 Natural Resources and Ecological Receptors

A terrestrial ecological evaluation (TEE) was conducted for the Site. The Site qualifies for an exclusion from further evaluation, because there is less than 0.5 acre of contiguous undeveloped land on or within 500 feet of the Site. The TEE exclusion form and an aerial map depicting a 500-foot radius surrounding the Site are included as Appendix B.

Section 4.0 Contaminant Occurrence and Movement

4.1 Summary of Previous Investigations

Forty-one soil borings have been advanced at the Site. Ten soil borings have been completed as monitoring wells (seven on-Property monitoring wells, and three off-Property monitoring wells). Five soil borings have been completed as ozone injection wells. Soil data was not collected during the installation of the ozone injection wells. A summary of work completed during the investigations listed above was included in the *Soil and Groundwater Assessment Report* for the Site, prepared by Stantec Consulting Services, Inc., dated March 14, 2012.

4.2 Soil

Figure 4 presents the locations of all soil samples collected during the investigation activities conducted at the Site since 2005. A summary of all soil sample locations submitted for analyses, including the date of the sample, depth, consultant performing sampling, and analytical methods and results are presented in Table 1. The majority of the soil sampling has been conducted in the vicinity of the dispenser islands, product conveyance system, and UST basin. The depths of soil samples collected ranges from 2 to 20 feet bgs. All available historical boring logs for the previous investigations are included in Appendix C.

Soil sampled in the vicinity of the former dispenser islands has contained concentrations of one or more of the following petroleum hydrocarbons constituents at concentrations greater than the SLs: total petroleum hydrocarbons (TPH) as gasoline (TPHg), and/or benzene, toluene, ethylbenzene, and xylenes (BTEX). Soil sampled in the vicinity of the former heating oil UST has contained concentrations of TPHg, TPH as diesel (TPHd), TPH as oil (TPHo), and carcinogenic polycyclic aromatic hydrocarbons (cPAHs). Petroleum hydrocarbon impact to soil is limited vertically to depths between 15 and 20 feet bgs in the vicinity of the former dispenser islands. Impacts to soil in the vicinity of the former heating oil UST are limited vertically between 10 and 15 feet bgs. The lateral extent of petroleum hydrocarbon impacts may extend to the west beyond the Property boundary (i.e., west of boring B-6) into the MLK Jr. Way South right-of-way. However, soil samples collected from borings MW-6 and MW-7 indicate impacts do not extend beyond the western boundary of MLK Jr. Way South. The lateral extent of impacts to the south is likely just beyond boring P-10 on the western portion of the Property and just beyond boring MW-9 in the middle of the Property. The lateral extent of impacts to the north extends just beyond boring B-7. Sufficient data are not available to determine whether the impacts extend off the Property to the east beyond boring B-3. The extent of SL exceedences in soil are depicted on Figure 4.

4.3 Groundwater

Ten groundwater monitoring wells were installed at the Site in 2011 and 2012. The locations of all monitoring wells are presented in Figure 2. Table 2 presents the dates sampled, groundwater elevations, and the analytical results for each groundwater sampling event.

Based on the most recent sampling, TPHg concentrations in groundwater exceed SLs in monitoring wells MW-3 and MW-8. TPHd and total xylene concentrations exceed SLs in well MW-8. Total lead concentrations exceed the SL in wells MW-1, MW-7, and MW-8.

Petroleum impacts to groundwater, as characterized by exceedences of the SLs, are generally limited to the vicinity of the former dispenser islands and immediately down-gradient. The concentrations of contaminants in monitoring well MW-3 indicates groundwater impacts may extend off-property. However, down-gradient wells MW-6 and MW-7 indicate groundwater impacts do not extend beyond the MLK Jr. Way South right-of-way. Petroleum contaminated soil in the vicinity of the former heating oil UST (borings B-3 and MW-9) do not appear to impact groundwater. This is indicated by ground water samples from monitoring well MW-9, which have not contained any concentrations exceeding SLs.

One or more of the analytes TPHg, TPHd, total xylenes, total lead, naphthalene, and cPAH were detected in grab groundwater samples collected from borings B-1 through B-7. Although useful for screening potential monitoring well locations, this data will not be used for Site characterization purposes because it was not collected from appropriately constructed monitoring wells.

Concentrations of chlorinated solvents exceeding SLs have been detected in monitoring wells throughout the Property with the highest concentrations being in MW-9, which is located on the hydraulically upgradient portion of the Property. Historic activities at the Property do not indicate an on-Property source of chlorinated solvents. As mentioned above, the Mount Baker Cleaners Site has been listed as a cleanup site with Ecology is located immediately up-gradient of the Site, and is the most likely source of the chlorinated solvents detected at the Property.

For the purposes of this RI/FS, chlorinated solvents will not be considered a contaminant of concern (COC) for the Site since the Property is not a source of chlorinated solvents for the Site, and the chlorinated solvents are present at the Property solely through passive migration from an off-Property source. Additional sampling and analysis as described in Sections 9.2 and 9.3 will be used, in part, to confirm this condition.

4.4 Surface Water

No surface water has been sampled as there has been no indication that any surface water body has been impacted by a release from the Property.

4.5 Sediment

No sediment has been sampled as there has been no indication that any surface water body has been impacted by a release from the Property.

4.6 Air/Soil Vapor

Air/soil vapor assessment has not been conducted at the Site. Results of previous investigations indicate that shallow soil impacts are south of the existing Property building and consist of heavier range hydrocarbons that do not volatize as easily. There is no data to suggest that the Property building or any adjacent buildings are at risk of vapor intrusion under MTCA. Remaining soil impacts from potentially volatile petroleum hydrocarbon impacts beneath the Site are greater than 15 feet below ground surface and are submerged below the seasonal water table elevations (i.e., no remaining volatile contamination in the vadose zone soils). A minor amount of diesel-range petroleum hydrocarbons at concentrations exceeding 10,000 mg/kg is present south of the current building at approximately 10 to 15 feet below ground surface. The impacted soil is partially submerged. The nearby and downgradient monitoring well MW-9 does not show any adverse impacts to groundwater. This area will be further assessed and will likely be removed during future remedial excavation, and therefore are not considered in this evaluation of the potential vapor intrusion pathway. Additionally, LNAPL has never been present at the site.

Occasionally, seasonal fluctuations in dissolved-phase hydrocarbons in shallow groundwater do exceed Ecology's Vapor Intrusion (VI) groundwater SLs (Appendix B of Ecology's "*Guidance for Evaluating Soil Vapor Intrusion in Washington State*") for benzene in MW-10, Xylenes in MW-8, and potentially for volatile petroleum hydrocarbon (VPH) in wells MW-3 and MW-8. Since the Property may be redeveloped in the future, and these constituents may underlie existing buildings or areas of future development, "Preliminary" screening models were developed using American Petroleum Institute's (API's), "BIOVAPOR - *Indoor Vapor Intrusion Model*." The model runs conservatively, using the highest TPHg, TPHd, BTEX and Napthalene concentrations detected during the last four quarterly groundwater monitoring events at MW-8 (on-site future development) and MW-10 (off-site existing development) data. Input parameters for the on-site future development assumed that the existing building would be demolished and a new building with a footprint of approximately 10,854 square feet would be constructed (i.e., conservatively covering the entire site's lot size, per King County Assessor's info). Model outputs for MW-8 and MW-10 are presented in Appendix D.

Based on the modeling results, there is no threat of exceeding indoor air quality for existing or future on-site commercial buildings. Existing concentrations of dissolved-phase contaminants are too low to pose a risk of vapor intrusion to existing or future buildings at or near the Site. In addition, no current buildings are located directly over the contaminants. Plus, dissolved-phase groundwater concentrations over time are anticipated to continue to decline. Therefore, the contaminant source is too weak and too far away from existing or future buildings to pose an unacceptable VI risk and this pathway is incomplete.

Section 5.0 Conceptual Model

Petroleum was released into soil at the service station sometime prior to station decommissioning in 1989. It is not certain when or how the releases occurred, but soil sampling data indicates that the releases are most likely associated with the former dispenser islands present on the Property from approximately 1955 through 1989 and a former heating oil UST present on the Property until 2005. Soil containing residual petroleum hydrocarbon concentrations exceeding SLs still remains at the Site in the western portion of the Property in the vicinity of the former dispenser islands and the eastern portion of the Property in the vicinity of the former heating oil UST. Soil samples collected from soil boring B-6 indicate impacts extend off-Property to the west, but soil samples collected from borings MW-6 and MW-7 indicate the exceedences do not extend beyond the ML Jr. Way South right-of-way. More information is necessary to determine whether soil impacts in the vicinity of the former heating oil UST may extend off the Property to the east.

The Property has likely been capped by asphalt and concrete since at least 1955 and therefore has not been exposed to infiltrating surface water. Soil beneath the Property is primarily glacial till consisting of dense silts, sands, and gravels to the maximum explored depth of 25 feet bgs. Depth to groundwater ranges from approximately 9.5 to 13.5 feet bgs. Impacted soil near the former dispenser islands is located in the 15 to 20 feet bgs range and is likely in contact with groundwater year round. Impacted soil near the former heating oil UST is located in the 10 to 15 feet bgs range and is likely in contact with groundwater at least part of the year.

The groundwater flow direction is to the southwest toward the center of the Rainier Valley. Groundwater impacts are primarily limited to the immediate vicinity of the former dispenser islands. Due to the concentrations of contaminants in monitoring well MW-3 and its proximity to the Property boundary, groundwater impacts may extend off-Property to the west. However, down-gradient wells MW-6 and MW-7 indicate groundwater impacts do not extend to the west beyond MLK Jr. Way South.

Remedial actions must consider likely future uses of the Site. Here, the impacts are largely confined to the Property. The Property zoning is Neighborhood Commercial, which allows ground floor commercial uses.

In accordance with MTCA, potential exposure pathways for human and environmental receptors based on the current and planned land uses identified during this investigation include the following:

- Human health protection from soil to groundwater (drinking water)
- Human health protection from direct soil contact
- Human health protection from groundwater (direct contact)
- Human health protection from soil vapor inhalation
- Human health protection from soil to surface water
- Human health protection from groundwater to surface water
- Terrestrial ecological protection

Based on information provided above, the following conclusions can be made:

- Impacted soil poses a threat to groundwater because soil concentrations exceed SLs within and proximal to the saturated zone.
- Additional evaluation is necessary to determine whether impacted groundwater poses a threat to drinking water. Groundwater at the Site is not a current drinking water resource and groundwater has not migrated to a current source of drinking water. However, an evaluation of groundwater as a potential future source of drinking water has not yet been conducted. Groundwater at the Site may not qualify as drinking water based on sustained yield. Aquifer-specific testing is required to assess whether the on-Property aquifer qualifies as a source of potable groundwater as defined in WAC 173-340-720 (2).
- Additional evaluation is necessary to determine whether soil concentrations at the Site pose a direct contact risk. The only soil at the Site exceeding a SL for direct contact is located at approximately 10 feet bgs in the vicinity of soil borings MW-9 and B-3. All other soil samples collected at the Site exceeding a SL for protection of direct contact are at or below the point of compliance (15 feet bgs). Site-specific hydrocarbon fractionation data from soil in the vicinity of MW-9 and B-3 are necessary to develop site-specific cleanup levels protective of a direct contact risk.
- Additional evaluation is necessary to determine whether groundwater concentrations at the Site pose a direct contact risk. Site-specific hydrocarbon fractionization data from groundwater are necessary to appropriately develop Site-specific TPH cleanup levels for protection of a construction/excavation worker using the Oregon Department of Environmental Quality (DEQ) model for TPH risk-based cleanup levels revised on November 15, 2011. Appropriate TPH cleanup levels will be calculated prior to implementation of a cleanup action. The DEQ model may be used since no such model exists in MTCA and other appropriate guidance or tools have not been provided by Ecology.
- Additional evaluation is necessary to determine whether soil concentrations at the Site pose a threat to groundwater based on direct contact. Using MTCA Method B, appropriate cleanup levels for soil will be calculated which are protective of groundwater at concentrations that are based on direct contact using the Oregon DEQ model described above.
- • Vapor intrusion from impacted soil and groundwater does not pose a threat to current or potential future buildings on or near the Site. Shallow soil contamination (approx. 10 to 15 feet bgs) is only present in the vicinity of the former heating oil UST and does not consist of volatile constituents (i.e., TPHg or BTEX). Based on groundwater monitoring data, it is also not leaching volatile compounds into the groundwater. Remaining soil contamination is located at depths greater than 15 feet bgs, which is below the water table. Therefore, dissolved-phase hydrocarbons in groundwater are the only potential source of VI risk. Although the impacted groundwater will likely underlie areas of future development, modeling of groundwater impacts relative to the vapor intrusion pathway indicate that the contaminant concentrations are too low to result in an unacceptable risk of vapor intrusion into a existing or future Site buildings (Appendix D). In addition, the future dissolved-phase groundwater concentrations are anticipated to continue to decrease over time.

- Impacted soil does not pose a threat to surface water due to the distance to any surface water body.
- Impacted groundwater does not pose a threat to surface water due to the physical distance separating impacted groundwater and surface water.
- The Site qualifies for an exclusion from further TEE.

The following potential exposure pathways require additional evaluation:

- Groundwater as a potential future drinking water source
- Soil direct contact
- Soil protective of groundwater to a direct contact exposure
- Groundwater direct contact

Section 6.0 Cleanup Standards – Soil and Groundwater

In accordance with MTCA, development of cleanup levels includes identifying potential exposure pathways for the soil and groundwater impacts at the Site, taking into account current and future land uses. The Property is currently zoned for commercial use, and future zoning is not anticipated to change. Potential COCs for this Site include the compounds listed in MTCA 173-340-900 Table 830-1 *Required Testing for Petroleum Releases*.

Based on the evaluation of potential exposure pathways presented in Section 5.0, Method B cleanup levels can be used if groundwater is proven to be non-potable. Site-specific TPH soil cleanup levels for direct exposure to groundwater can be calculated using the Oregon DEQ model for TPH cleanup level calculation.

Final CUL development will be performed either during the FS or during development of the CAP. The CULs will be based upon the data resulting from implementation of the RI/FS work plan and in consideration of the exposure pathways at the Site.

Section 7.0 Areas Requiring Further Investigation and Conclusions

7.1 Constituents of Concern

CRA evaluated potential COCs based on the compounds listed in MTCA 173-340-900 Table 830-1 *Required Testing for Petroleum Releases*. Based on the results of environmental activities conducted at the Site, the COCs requiring further evaluation at the Site include TPHg, TPHd, TPHo, cPAHs, naphthalene, PCBs, and HVOCs.

7.2 Soil – Vertical and Lateral

Figure 4 identifies remaining soil containing petroleum hydrocarbon concentrations above the SLs. Additional delineation of the lateral extent of soil impacts is required to the east of the former heating oil UST and south and east of monitoring well MW-9.

In addition, based on MTCA 173-340-900 Table 830-1, additional testing for the presence of the following analytes is required:

- PCBs in the vicinity of the former heating oil and the waste oil USTs
- HVOCs in the vicinity of the former heating oil and waste oil USTs
- cPAHs in the vicinity of the former waste oil UST

In order to develop Site-specific cleanup levels, select soil samples will be analyzed for extractable petroleum hydrocarbon (EPH) and volatile petroleum hydrocarbon (VPH) fractions remaining at the Site. Additionally, n-hexane from the vicinity of the former dispenser islands and former heating oil UST will be collected. Site-specific soil cleanup levels will be developed using the MTCATPH11.1 (or most recent version) tool maintained by Ecology.

7.3 Groundwater – Vertical and Lateral

Figures 5 and 6 present the November 2012 groundwater elevation contour map and analytical results for groundwater, respectively. The groundwater flow direction is consistently towards the southwest and the extent of petroleum hydrocarbons exceeding the SLs is delineated in all directions at the Site.

In order to develop Site specific cleanup levels, groundwater samples from the vicinity of the former dispenser islands and former heating oil UST will be collected and analyzed for EPH and VPH.

A groundwater sample will be collected in the northeast corner of the Property to verify that the Mount Baker Drycleaners Site, located northeast (up-gradient) of the Property is the off-Property source of the chlorinated solvents and related compounds observed in groundwater samples collected at the Site.

7.4 Groundwater Potability

The shallow groundwater zone beneath the Property is not considered a current drinking water source based on its near surface location, urban setting, and lack of proximity to a water supply well. However, to verify that groundwater is not a drinking water source, CRA intends to perform a groundwater yield test. As stated in MTCA [WAC 173-340-720(2)(b)(i)], groundwater must be present in sufficient quantity to yield greater than 0.5 gallon per minute (gpm) on a sustainable basis to be classified as potable water. The testing well must constructed in manner compliant with WAC 173-160 and in accordance with normal domestic water well construction practices in the area. It is generally accepted that the well must fully penetrate the local aquifer and well performance must be adjusted to that of a 6-inch diameter well if a smaller diameter well is tested. If the yield is less than 0.5 gpm and groundwater is not migrating to another beneficial use receptor (i.e., surface water and/or beneficial use aquifer), then groundwater cleanup levels based on ingestion will not be established. As part of this evaluation, it is necessary to determine the thickness of the perched zone. This will be accomplished by advancing a soil boring until dry soil is encountered. A groundwater pumping well will be installed in the completed soil boring with the screened interval of the well constructed to fully penetrate the saturated perched layer. This well will be used to perform the yield test.

Section 8.0 Scope of Work

8.1 Pre-Field Activities

8.1.1 Health and Safety

A Site-specific health and safety plan (HASP) will be prepared in accordance with federal regulations (Title 40, Code of Federal Regulations, Section 1910.120). The HASP will identify potential physical and chemical hazards associated with the proposed field activities and will outline safe working practices.

8.1.2 Underground Utility Clearance

Prior to any Site work involving soil disturbance, Washington State One Call Utility Notification Service will be called to alert the utility companies in the area of the scheduled work and to request identification of all underground utilities in the vicinity of the disturbance area. A private utility locating contractor will be retained to mark private utilities and to verify the absence of all underground utilities near each of the proposed boring locations.

To further mitigate the chances of encountering a subsurface utility, each soil boring will be hand cleared to a depth of 5 feet using a hand augur, air knife, or other appropriate method.

8.2 Soil – Vertical and Lateral

Seven soil borings will be advanced to further delineate soil impacts at the Site. The borings will be advanced by a Washington State licensed driller using a direct-push drill rig. The locations of the proposed borings are presented on Figure 7. The table below outlines sample location, sample depth, and selected analysis per boring location:

Proposed Boring	*Anticipated Soil Samples Per Boring*	*Anticipated Total Depth*	*Purpose*	*Soil Analysis*
B-8	1 – 5 feet bgs 1 – 10 feet bgs 1 – 15 feet bgs 1 – 20 feet bgs	20 feet bgs	Evaluate potential soil impacts associated with the former and current waste oil and heating oil USTs Vertical delineation of soil impacts Collection of EPH/VPH samples for Method B cleanup level calculations	TPHg, TPHd, TPHo, BTEX, PCBs, HVOCs, cPAHs, Naphthalenes (all samples) n-hexane, EPH, VPH (10 foot sample or sample with highest PID reading)
B-9	1 – 5 feet bgs 1 – 10 feet bgs 1 – 15 feet bgs 1 – 20 feet bgs	20 feet bgs	Lateral delineation of soil impacts to the south of MW-9	TPHg, TPHd, TPHo, BTEX, cPAHs, Naphthalenes (all samples) *PCBs (Hold for analysis based on results of boring B-8)*
B-10	1 – 5 feet bgs 1 – 10 feet bgs 1 – 15 feet bgs 1 – 20 feet bgs	20 feet bgs	Evaluate potential soil impacts associated with the former waste oil and heating oil UST locations Vertical delineation of soil impacts Collection of EPH/VPH samples for Method B cleanup level calculations	TPHg, TPHd, TPHo, BTEX, PCBs, HVOCs, cPAHs, Naphthalenes (all samples) n-hexane, EPH, VPH (10 foot sample or sample with highest PID reading)
B-11	1 – 5 feet bgs 1 – 10 feet bgs 1 – 15 feet bgs 1 – 20 feet bgs	20 feet bgs	Lateral delineation of soil impacts to the east of B-3	TPHg, TPHd, TPHo, BTEX, cPAHs, Naphthalenes (all samples) *PCBs (Hold for analysis based on results of boring B-10)*

Proposed Boring	*Anticipated Soil Samples Per Boring*	*Anticipated Total Depth*	*Purpose*	*Soil Analysis*
B-12	1 – sample based on field screening or at 15 feet bgs	20 feet bgs	Evaluate potential soil impacts associated with the former gasoline and waste oil USTs removed in 1989	TPHg, TPHd, TPHo, BTEX, HVOCs, PCBs, cPAHs, Naphthalenes
MW-11	1 – sample based on field screening 1 – 15 feet bgs	20 feet bgs	Evaluate potential upgradient soil impacts To be completed as a monitoring well	TPHg, TPHd, TPHo, BTEX, HVOCs (all samples)
MW-12	1 – 5 feet bgs 1 – 10 feet bs 1 – 16 feet bgs 1 – 20 feet bgs 1 – 25 feet bgs	30 feet bgs or until borehole is dry; to a maximum 45 feet	Vertical delineation of soil impacts associated with the former pump islands Collection of EPH/VPH samples for Method B cleanup level calculations To be completed as a monitoring well	TPHg, TPHd, TPHo, BTEX, cPAHs, Naphthalenes (all samples) n-hexane, EPH, VPH (16 foot sample or sample with highest PID reading)

bgs = below ground surface
TPHg = Gasoline range organics per Method Northwest Total Petroleum Hydrocarbon Identification (NWTPH)-Gx;
TPHd = Diesel range organics per Method Northwest Total Petroleum Hydrocarbon Identification (NWTPH)-Dx;
TPHo = Heavy oil range organics per Method Northwest Total Petroleum Hydrocarbon Identification (NWTPH)-Dx;
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes per EPA Method 8260B;
cPAHs = Carcinogenic Polycyclic aromatic hydrocarbons
PCBs = Polychlorinated Biphenyl
HVOCs = Halogenated Volatile Organic Carbons

8.3 Monitoring Well Installation and Sampling

Two of the soil borings, MW-11 and MW-12, will be completed as monitoring wells. Monitoring well MW-11 will be screened from 10 to 20 feet bgs. Monitoring well MW-12 will be screened from 10 feet bgs to the bottom of the borehole. Monitoring well MW-11 will be constructed with 2-inch Schedule 40 polyvinyl chloride (PVC) screen. Monitoring well MW-12 will be constructed with 4-inch Schedule 40 PVC screen. Each well screen will be 0.010-inch slot, flush threaded with PVC blank well casing from the top of the screen to ground surface. The well annulus will be backfilled with a 10-20 size washed sand pack to at least 1 foot above the top of the screen and sealed with hydrated bentonite chips and concrete to the surface. The surface of the well will be completed with a lockable steel housing embedded in concrete and installed flush with the ground surface with a traffic-rated monument.

The newly installed monitoring wells will be sampled as part of the next quarterly groundwater monitoring event. The laboratory analyses for the groundwater samples will be determined based on the results of the soil analytical data but will include at a minimum, NWTPH-Gx, NWTPH-Dx, BTEX,

HVOCs, EPH, and VPH. Groundwater collected from monitoring well MW-11 will be sampled for chlorinated solvents.

8.4 Groundwater Potability Testing

A single well yield test will be completed on the newly installed monitoring well, MW-12, to determine if the well can sustain a long-term pumping rate of 0.5 gpm for a period of 24 hours as defined in WAC 173-340-720(2)(b)(i). It is anticipated that the necessary data can be collected in less than 24 hours and therefore, the test will likely continue for a period of no more than 8 hours. Groundwater from the yield test will be pumped into 55-gallon steel drums. The drums will be labeled and stored on-Property for later disposal.

Water Level Measurements

Prior to beginning the yield test, water levels will be measured in each on-Property well and recorded to the nearest 0.1 foot. The water level will be measured again within the pumping well after placement of the pump and before pumping begins. Water within the well will be given time to stabilize after placement of the pump and prior to pumping. After pumping commences, the water level within the pumping well will be measured as follows:

Time since start of pumping	***Time interval between water level measurements***
0 to 5 minutes	0.5 minute
5 to 60 minutes	5 minutes
60 to 120 minutes	20 minutes
120 minutes to shutdown	60 minutes
Shutdown to 80% well recharge	5 minutes

At the completion of pumping, water levels will be measured and recorded once in all on-Property wells, and then every 5 minutes in the pumping well (MW-12) until the well has recharged to 80 percent of its initial water level measurement, or until at least 1 hour has passed.

Initial Pumping Rate

At the start of the yield test, the pump will be set at a rate of 0.25 gallon per minute (gpm), or 0.95 liter per minute. An inline digital or totalizing flow meter will be utilized to obtain an accurate pumping rate. The time between starting the pump and achieving a 0.25 gpm pumping rate will be recorded. If the well dewaters, the pump will be stopped, and water level measurements will be recorded once per minute until the well has recovered to at least 80 percent of its original water level, at which time pumping will be re-initiated at a rate of 0.25 gpm. If the well dewaters three times consecutively within 8 hours, the yield test will be ceased. If the well dewaters once and does not recharge within 2 hours, the yield test will be ceased.

Step Up Pumping Rate

If the pumping well can sustain a rate of 0.25 gpm for a 2 hour period, the pumping rate will be increased to 0.5 gpm (1.89 liters per minute). Water level will be measured and recorded as indicated in Section 3.2.1. Pumping will continue at 0.5 gpm until the well dewaters and recharges three times (or until the well does not recharge within 2 hours), or until 8 hours of testing has been completed.

8.5 Investigation Derived Waste (IDW)

IDW will include decontamination fluids, soil from borings and purged well water. All IDW will be placed in properly labeled 55-gallon drums and stored on-Property pending analyses. The IDW will be disposed of according to Phillips 66 procedures and applicable regulatory requirements.

Section 9.0 References

City of Seattle, *Generalized Zoning Map,* January 27, 2012.

G-Logics, Inc., *Phase I Environmental Site Assessment*, January 11, 2005

G-Logics, Inc., *Phase II Environmental Site Assessment and Equipment Removal*, March 17,2005

G-Logics, Inc., *Summary Report, Site Remediation and Groundwater Monitoring*, August 2, 2007

Stantec *Consulting Services, Inc., Soil and Groundwater Assessment Report*, March 14, 2012

Waldron et al., 1962. *Preliminary Geologic Map of Seattle and Vicinity, Washington,* United States Geological Survey Miscellaneous Geological Investigation Map I-354.

Figures

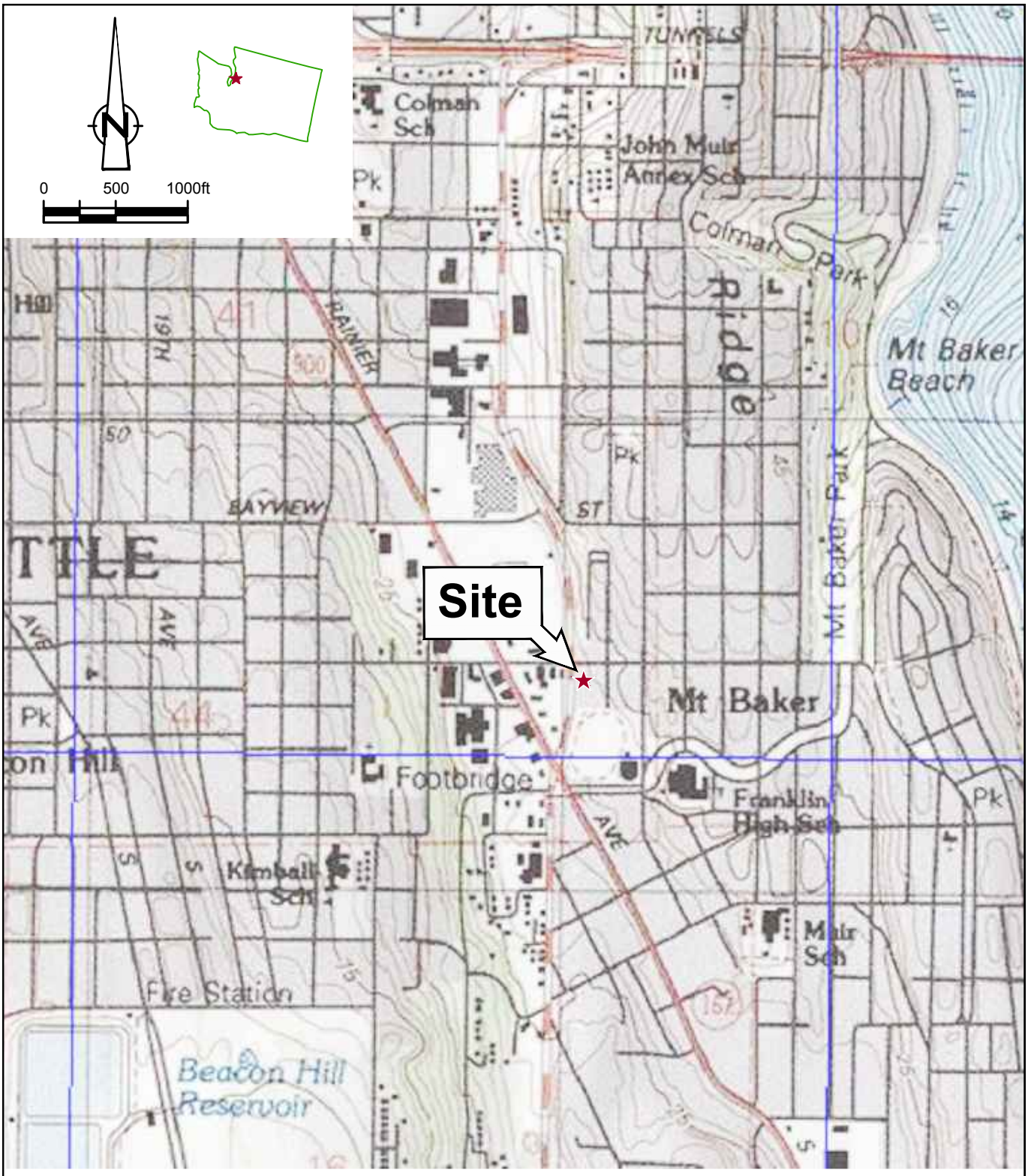

Figure 1

VICINITY MAP
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

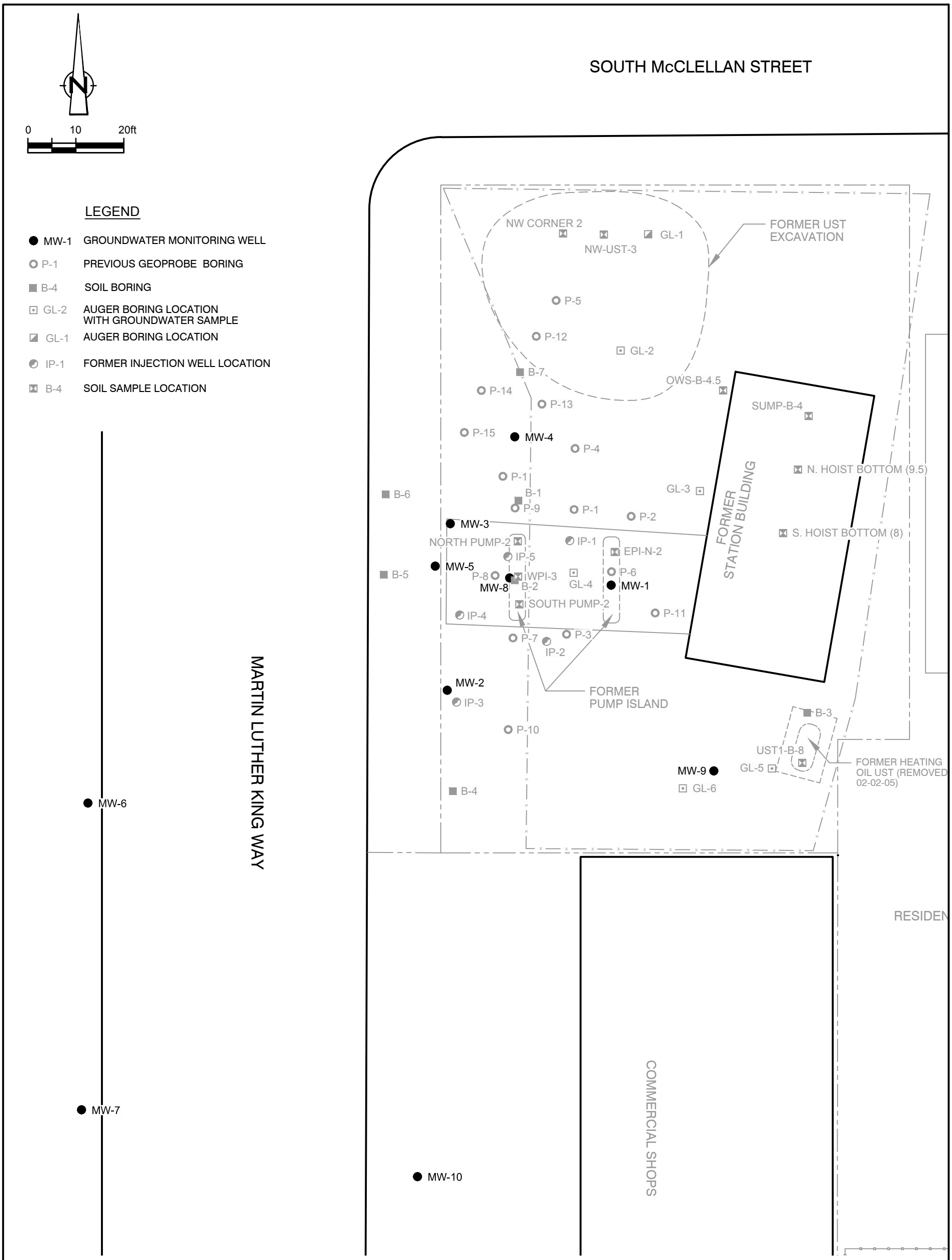

figure 2

SITE PLAN
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

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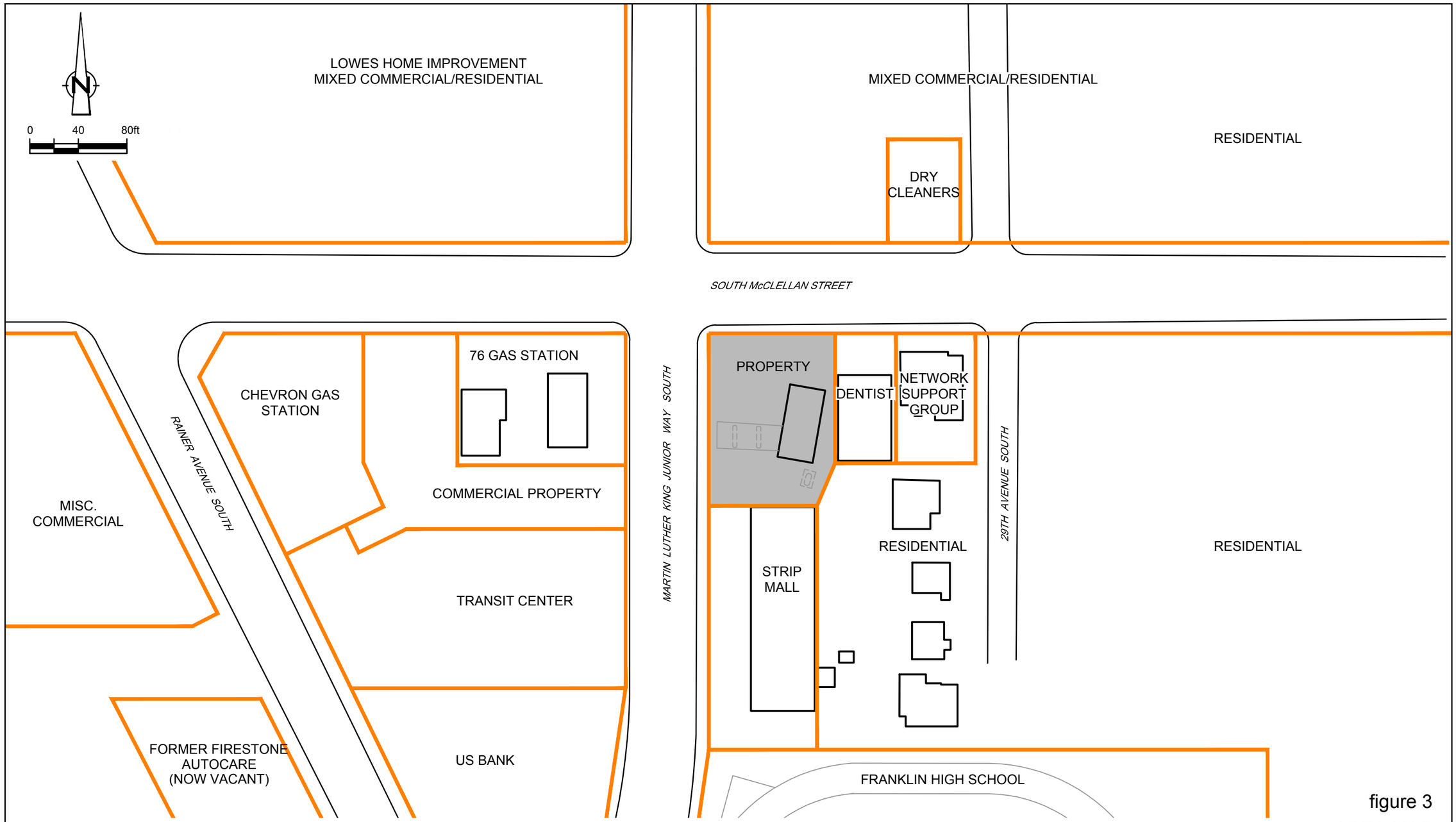

figure 3

AREA MAP
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

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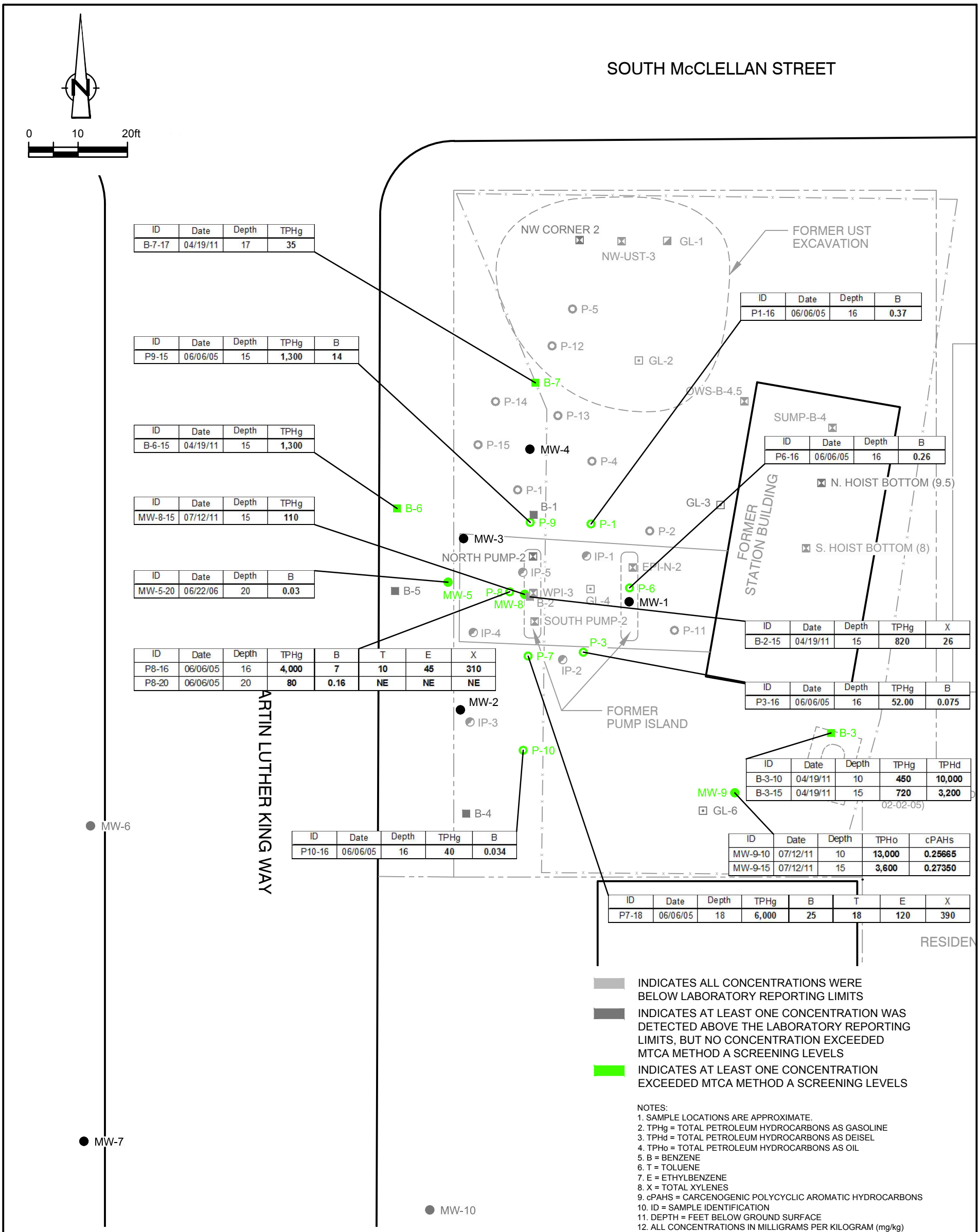

ID	Date	Depth	TPHg
B-7-17	04/19/11	17	**35**

ID	Date	Depth	TPHg	B
P9-15	06/06/05	15	**1,300**	**14**

ID	Date	Depth	TPHg
B-6-15	04/19/11	15	**1,300**

ID	Date	Depth	TPHg
MW-8-15	07/12/11	15	**110**

ID	Date	Depth	B
MW-5-20	06/22/06	20	**0.03**

ID	Date	Depth	TPHg	B	T	E	X
P8-16	06/06/05	16	**4,000**	**7**	**10**	**45**	**310**
P8-20	06/06/05	20	**80**	**0.16**	**NE**	**NE**	**NE**

ID	Date	Depth	TPHg	B
P10-16	06/06/05	16	**40**	**0.034**

ID	Date	Depth	B
P1-16	06/06/05	16	**0.37**

ID	Date	Depth	B
P6-16	06/06/05	16	**0.26**

ID	Date	Depth	TPHg	X
B-2-15	04/19/11	15	**820**	**26**

ID	Date	Depth	TPHg	B
P3-16	06/06/05	16	**52.00**	**0.075**

ID	Date	Depth	TPHg	TPHd
B-3-10	04/19/11	10	**450**	**10,000**
B-3-15	04/19/11	15	**720**	**3,200**

ID	Date	Depth	TPHo	cPAHs
MW-9-10	07/12/11	10	**13,000**	**0.25665**
MW-9-15	07/12/11	15	**3,600**	**0.27350**

ID	Date	Depth	TPHg	B	T	E	X
P7-18	06/06/05	18	**6,000**	**25**	**18**	**120**	**390**

INDICATES ALL CONCENTRATIONS WERE BELOW LABORATORY REPORTING LIMITS

INDICATES AT LEAST ONE CONCENTRATION WAS DETECTED ABOVE THE LABORATORY REPORTING LIMITS, BUT NO CONCENTRATION EXCEEDED MTCA METHOD A SCREENING LEVELS

INDICATES AT LEAST ONE CONCENTRATION EXCEEDED MTCA METHOD A SCREENING LEVELS

NOTES:
1. SAMPLE LOCATIONS ARE APPROXIMATE.
2. TPHg = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
3. TPHd = TOTAL PETROLEUM HYDROCARBONS AS DEISEL
4. TPHo = TOTAL PETROLEUM HYDROCARBONS AS OIL
5. B = BENZENE
6. T = TOLUENE
7. E = ETHYLBENZENE
8. X = TOTAL XYLENES
9. cPAHS = CARCENOGENIC POLYCYCLIC AROMATIC HYDROCARBONS
10. ID = SAMPLE IDENTIFICATION
11. DEPTH = FEET BELOW GROUND SURFACE
12. ALL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)
13. CONCENTRATIONS IN BOLD INDICATE AN EXCEEDANCE OF THE MTCA METHOD A CLEANUP LEVEL
14. NE = NO EXCEEDENCES

LEGEND

MW-1	GROUNDWATER MONITORING WELL
P-1	PREVIOUS GEOPROBE BORING
B-4	SOIL BORING
GL-2	AUGER BORING LOCATION WITH GROUNDWATER SAMPLE
GL-1	AUGER BORING LOCATION
IP-1	FORMER INJECTION WELL LOCATION
B-4	SOIL SAMPLE LOCATION

figure 4

SOIL INVESTIGATION DATA MAP
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

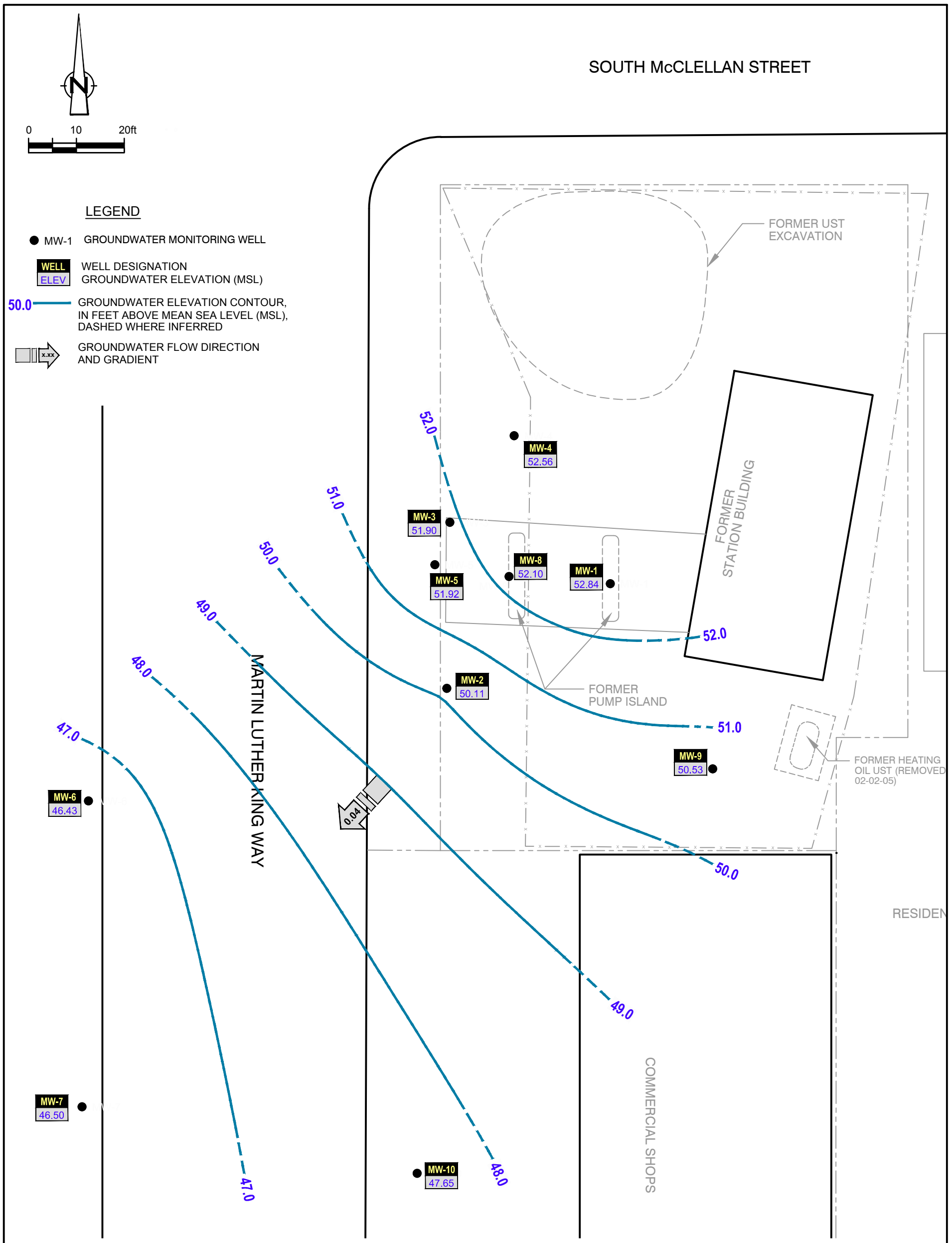

figure 5

GROUNDWATER ELEVATION CONTOUR MAP - NOVEMBER 2012
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

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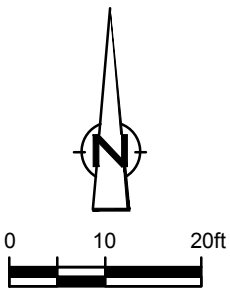

LEGEND

● MW-1 GROUNDWATER MONITORING WELL

WELL	WELL DESIGNATION
TPHg	TPHg CONCENTRATION (µg/L)
TPHd	TPHd CONCENTRATION (µg/L)
BENZ	BENZENE CONCENTRATION (µg/L)
TOUL	TOULENE CONCENTRATION (µg/L)
ETH	ETHYLBENZENE CONCENTRATION (µg/L)
TOTAL	TOTAL XYLENES CONCENTRATION (µg/L)

* SAMPLED ON 12/6/12

D DUPLICATE

SOUTH McCLELLAN STREET

FORMER UST EXCAVATION

FORMER STATION BUILDING

FORMER PUMP ISLAND

FORMER HEATING OIL UST (REMOVED 02-02-05)

RESIDEN

MARTIN LUTHER KING WAY

COMMERCIAL SHOPS

	WELL	TPHg	TPHd	BENZ	TOUL	ETH	TOTAL
MW-6*	MW-6	<50	<31	<0.5	<0.5	1	6
MW-7*	MW-7	<50	<29	<0.5	<0.5	<0.5	<0.5
MW-3*	MW-3	6,700	290	<0.5	<0.5	160	480
MW-4	MW-4	<50	<32	<0.5	<0.5	<0.5	<0.5
MW-5*	MW-5	170	40	<0.5	<0.5	2	8
MW-8	MW-8	13,000/12,000 D	2,600/2,600 D	<0.5/<0.5 D	0.8/0.8 D	95/91 D	1,100/1,100 D
MW-1	MW-1	<50	<29	<0.5	<0.5	<0.5	<0.5
MW-2*	MW-2	590	250	2	<0.5	3	11
MW-9	MW-9	<50	39	<0.5	<0.5	<0.5	<0.5
MW-10*	MW-10	130	220	3	0.6	<0.5	4

figure 6

GROUNDWATER CONCENTRATION MAP - NOVEMBER 2012
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

CRA

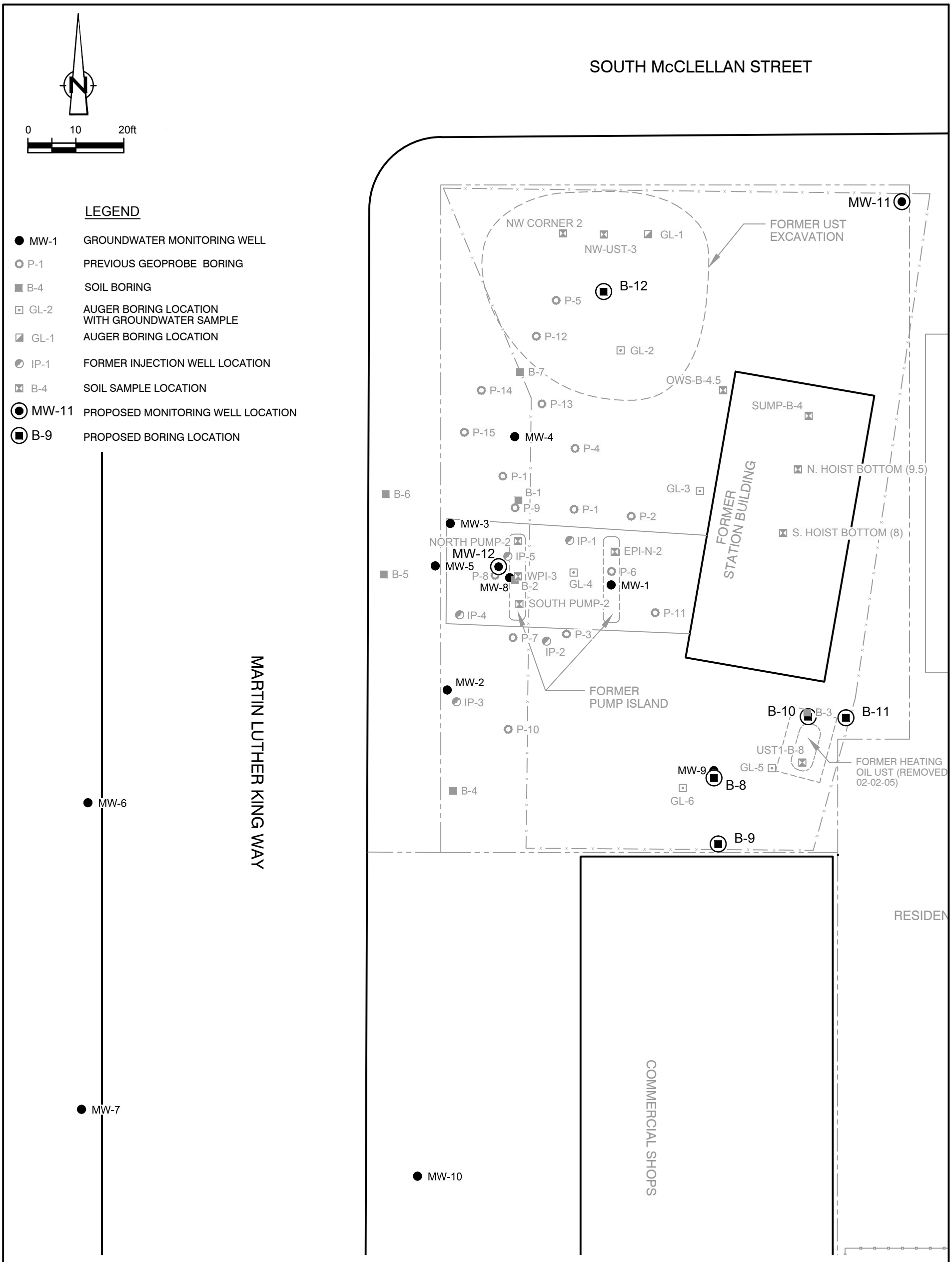

figure 7

SITE PLAN AND PROPOSED LOCATIONS
FORMER TIDEWATER SERVICE STATION
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MARTIN LUTHER KING WAY SOUTH
Seattle, Washington

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Tables

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

				HYDROCARBONS			*PRIMARY VOCs*				*LEAD*	*PAHs*	
Sample ID	***Consultant***	***Sample Date***	***Sample Depth***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***Total***	***Total cPAHs***	***Naphthalene***
		MTCA Method A Screening Levels		***30/100***	***2000***	***2000***	***0.03***	***7***	***6***	***9***	***250***	***0.1***	***5***
		MTCA Method B Screening Levels (soil direct contact)		***2645***	***2645***	***2645***	***18***	***6,400***	***8,000***	***16,000***	***NE***	***NE***	***1,600***
			ft	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***
UST1-B-8	G-Logics	2/2/2005	8	--	770	460	--	--	--	--	--	--	--
OWS-B-4.5	G-Logics	2/2/2005	4.5	--	ND	ND	--	--	--	--	--	--	--
North Pump-2	G-Logics	2/2/2005	2	ND	23	ND	ND	ND	ND	ND	--	--	--
South Pump-2	G-Logics	2/2/2005	2	ND	ND	ND	ND	ND	ND	ND	--	--	--
Sump-B-4	G-Logics	2/2/2005	4	--	ND	ND	--	--	--	--	--	--	--
N. Hoist Bottom (9.5)	G-Logics	2/2/2005	9.5	--	ND	1,000	--	--	--	--	--	--	--
S. Hoist Bottom (8)	G-Logics	2/2/2005	8	--	ND	ND	--	--	--	--	--	--	--
GL1-5	G-Logics	2/9/2005	5	ND	--	--	ND	ND	ND	ND	--	--	--
GL2-4	G-Logics	2/9/2005	5	ND	--	--	ND	ND	ND	ND	--	--	--
GL2-9	G-Logics	2/9/2005	9	ND	--	--	ND	ND	ND	ND	--	--	--
GL3-6	G-Logics	2/9/2005	6	--	ND	280	--	--	--	--	--	--	--
GL4-9	G-Logics	2/9/2005	9	ND	--	--	ND	ND	ND	ND	--	--	--
GL4-14	G-Logics	2/9/2005	14	ND	ND	ND	ND	ND	ND	ND	--	--	--
GL4-18	G-Logics	2/9/2005	18	ND	--	--	ND	ND	ND	ND	--	--	--
GL5-10	G-Logics	2/9/2005	10	--	1,400	120	--	--	--	--	--	--	--
GL5-15	G-Logics	2/9/2005	15	--	550	ND	--	--	--	--	--	--	--
GL5-20	G-Logics	2/9/2005	20	ND	ND	ND	ND	ND	ND	ND	--	--	--
GL6-15	G-Logics	2/9/2005	15	--	ND	530	--	--	--	--	--	--	--
GL6-20	G-Logics	2/9/2005	20	--	ND	ND	--	--	--	--	--	--	--
P1-4	G-Logics	6/6/2005	4	--	--	--	--	--	--	--	--	--	--
P1-8	G-Logics	6/6/2005	8	--	--	--	--	--	--	--	--	--	--
P1-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	0.16	--	--	--
P1-16	G-Logics	6/6/2005	16	ND	--	--	**0.37**	0.082	ND	ND	--	--	--
P2-4	G-Logics	6/6/2005	4	--	--	--	--	--	--	--	--	--	--
P2-8	G-Logics	6/6/2005	8	--	--	--	--	--	--	--	--	--	--
P2-12	G-Logics	6/6/2005	12	--	--	--	--	--	--	--	--	--	--
P2-16	G-Logics	6/6/2005	16	ND	--	--	ND	ND	ND	ND	--	--	--
P2-20	G-Logics	6/6/2005	20	--	--	--	--	--	--	--	--	--	--
P3-4	G-Logics	6/6/2005	4	--	--	--	--	--	--	--	--	--	--
P3-8	G-Logics	6/6/2005	8	--	--	--	--	--	--	--	--	--	--
P3-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P3-16	G-Logics	6/6/2005	16	**52**	--	--	**0.075**	ND	0.6	1.9	--	--	--
P3-20	G-Logics	6/6/2005	20	ND	--	--	ND	ND	ND	ND	--	--	--
P4-8	G-Logics	6/6/2005	4	--	--	--	--	--	--	--	--	--	--
P4-12	G-Logics	6/6/2005	12	--	--	--	--	--	--	--	--	--	--
P4-14	G-Logics	6/6/2005	14	ND	--	--	ND	ND	ND	ND	--	--	--
P4-14-Dup	G-Logics	6/6/2005	14	ND	--	--	ND	ND	ND	ND	--	--	--

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

				HYDROCARBONS			*PRIMARY VOCs*				*LEAD*	*PAHs*	
Sample ID	***Consultant***	***Sample Date***	***Sample Depth***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***Total***	***Total cPAHs***	***Naphthalene***
		MTCA Method A Screening Levels		***30/100***	***2000***	***2000***	***0.03***	***7***	***6***	***9***	***250***	***0.1***	***5***
	MTCA Method B Screening Levels (soil direct contact)			***2645***	***2645***	***2645***	***18***	***6,400***	***8,000***	***16,000***	***NE***	***NE***	***1,600***
			ft	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***
P4-20	G-Logics	6/6/2005	20	--	--	--	--	--	--	--	--	--	--
P5-12	G-Logics	6/6/2005	12	--	--	--	--	--	--	--	--	--	--
P5-15	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P5-19	G-Logics	6/6/2005	14	--	--	--	--	--	--	--	--	--	--
P6-4	G-Logics	6/6/2005	4	--	--	--	--	--	--	--	--	--	--
P6-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P6-12-dup	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P6-16	G-Logics	6/6/2005	16	16	--	--	**0.26**	0.05	ND	0.03	--	--	--
P6-18	G-Logics	6/6/2005	18	ND	--	--	ND	ND	ND	ND	--	--	--
P7-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P7-16	G-Logics	6/6/2005	16	--	--	--	--	--	--	--	--	--	--
P7-18	G-Logics	6/6/2005	18	**6,000**	--	--	**25**	**18**	**120**	**390**	--	--	--
P8-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P8-16	G-Logics	6/6/2005	16	**4,000**	--	--	**7**	**10**	**45**	**310**	--	--	--
P8-20	G-Logics	6/6/2005	20	**80**	--	--	**0.16**	0.04	0.63	4	--	--	--
P9-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--
P9-15	G-Logics	6/6/2005	15	**1,300**	--	--	**14**	2.2	ND	4.1	--	--	--
P9-16	G-Logics	6/6/2005	16	--	--	--	--	--	--	--	--	--	--
P9-20	G-Logics	6/6/2005	20	53	--	--	ND	ND	ND	0.3	--	--	--
P10-12	G-Logics	6/6/2005	12	--	--	--	--	--	--	--	--	--	--
P10-16	G-Logics	6/6/2005	16	**40**	--	--	**0.034**	0.05	0.35	1.6	--	--	--
P10-20	G-Logics	6/6/2005	20	--	--	--	--	--	--	--	--	--	--
P11-12	G-Logics	6/6/2005	12	ND	--	--	ND	ND	ND	ND	--	--	--

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

				HYDROCARBONS			*PRIMARY VOCs*				*LEAD*	*PAHs*	
Sample ID	***Consultant***	***Sample Date***	***Sample Depth***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***Total***	***Total cPAHs***	***Naphthalene***
		MTCA Method A Screening Levels		***30/100***	***2000***	***2000***	***0.03***	***7***	***6***	***9***	***250***	***0.1***	***5***
	MTCA Method B Screening Levels (soil direct contact)			***2645***	***2645***	***2645***	***18***	***6,400***	***8,000***	***16,000***	***NE***	***NE***	***1,600***
			ft	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***
P11-16	G-Logics	6/6/2005	16	--	--	--	--	--	--	--	--	--	--
P11-20	G-Logics	6/6/2005	20	--	--	--	--	--	--	--	--	--	--
NW-UST-3	G-Logics	8/5/2005	3	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
NW-UST-3-Duplicate	G-Logics	8/5/2005	3	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
WPI-3	G-Logics	8/5/2005	3	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
EPI-N-2	G-Logics	8/5/2005	2	<5.0	--	--	<0.020	<0.050	<0.050	<0.050	--	--	--
NW Corner@2	G-Logics	8/5/2005	2	12	--	--	<0.020	<0.050	<0.050	0.09	--	--	--
P12-4	G-Logics	6/22/2006	4	ND	ND	ND	ND	ND	--	--	--	--	--
P12-15	G-Logics	6/22/2006	15	ND	--	--	ND	ND	ND	ND	--	--	--
P13-20	G-Logics	6/22/2006	20	ND	--	--	ND	ND	ND	ND	--	--	--
P14-16	G-Logics	6/22/2006	16	ND	--	--	ND	ND	ND	ND	--	--	--
P15-20	G-Logics	6/22/2006	20	ND	--	--	ND	ND	ND	ND	--	--	--
P16-16	G-Logics	6/22/2006	16	ND	--	--	ND	ND	ND	ND	--	--	--
P16-20	G-Logics	6/22/2006	20	ND	--	--	ND	ND	ND	ND	--	--	--
MW-4-20	G-Logics	6/22/2006	20	ND	--	--	ND	ND	ND	ND	--	--	--
MW-5-12	G-Logics	6/22/2006	12	ND	--	--	ND	ND	ND	ND	--	--	--
MW-5-16	G-Logics	6/22/2006	16	ND	--	--	ND	ND	ND	0.16	--	--	--
MW-5-20	G-Logics	6/22/2006	20	22	--	--	**0.03**	ND	0.06	0.36	--	--	--
B-1-5	Stantec	4/18/2011	5	ND	--	--	ND	ND	ND	ND	2.17	--	--
B-1-10	Stantec	4/19/2011	10	2	--	--	ND	ND	ND	ND	2.32	--	--
B-1-15	Stantec	4/19/2011	15	40	--	--	ND	ND	ND	ND	2.17	--	--
B-1-18	Stantec	4/19/2011	18	ND	--	--	ND	ND	ND	ND	1.76	--	--
B-2-5	Stantec	4/18/2011	5	1.4	--	--	0.002	0.001	ND	0.002	11.6	--	--
B-2-11	Stantec	4/19/2011	11	12	--	--	0.001	0.002	ND	0.005	11.4	--	--
B-2-15	Stantec	4/19/2011	15	**820**	--	--	ND	ND	1.2	**26**	6.27	--	--
B-2-18	Stantec	4/19/2011	18	4.5	--	--	0.003	ND	0.007	0.15	5.62	--	--
B-3-5	Stantec	4/18/2011	5	ND	150	1,000	0.0008	ND	ND	ND	33.8	0.0838	<0.037
B-3-10	Stantec	4/19/2011	10	**450**	**10,000**	ND	ND	ND	ND	ND	2.21	0.0291	<0.038
B-3-15	Stantec	4/19/2011	15	**720**	**3,200**	ND	ND	ND	ND	ND	6.97	0.0132	2.7
B-3-20	Stantec	4/19/2011	20	ND	ND	ND	ND	ND	ND	ND	4.18	<0.0006	<0.00079
B-4-5	Stantec	4/18/2011	5	ND	--	--	0.001	ND	ND	ND	6.13	--	--
B-4-10	Stantec	4/19/2011	10	ND	--	--	ND	ND	ND	ND	5.21	--	--
B-4-15	Stantec	4/19/2011	15	ND	--	--	ND	ND	ND	ND	9.13	--	--
B-4-17	Stantec	4/19/2011	17	1.9	--	--	0.005	ND	ND	0.004	5.52	--	--
B-5-5	Stantec	4/18/2011	5	ND	11	ND	ND	ND	ND	ND	0.928	<0.0015	<0.0019
B-5-10	Stantec	4/19/2011	10	ND	ND	ND	ND	ND	ND	ND	2.13	<0.0006	<0.00075
B-5-15	Stantec	4/19/2011	15	ND	12	ND	ND	ND	ND	ND	1.81	<0.0006	<0.00077
B-5-18	Stantec	4/19/2011	18	ND	ND	ND	0.002	ND	ND	ND	4.53	<0.0006	0.0017
B-6-5	Stantec	4/18/2011	5	ND	--	--	ND	ND	ND	ND	1.96	--	--

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

				HYDROCARBONS			*PRIMARY VOCs*				*LEAD*	*PAHs*	
Sample ID	***Consultant***	***Sample Date***	***Sample Depth***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***Total***	***Total cPAHs***	***Naphthalene***
		MTCA Method A Screening Levels		***30/100***	***2000***	***2000***	***0.03***	***7***	***6***	***9***	***250***	***0.1***	***5***
	MTCA Method B Screening Levels (soil direct contact)			***2645***	***2645***	***2645***	***18***	***6,400***	***8,000***	***16,000***	***NE***	***NE***	***1,600***
			ft	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***	***(mg/kg)***
B-6-10	Stantec	4/19/2011	10	ND	--	--	ND	ND	ND	ND	2.38	--	--
B-6-15	Stantec	4/19/2011	15	**1,300**	--	--	ND	ND	1.9	8.4	5.21	--	--
B-6-17	Stantec	4/19/2011	17	ND	--	--	ND	ND	ND	0.025	19.3	--	--
B-7-5	Stantec	4/18/2011	5	ND	--	--	ND	ND	ND	ND	2.66	--	--
B-7-10	Stantec	4/19/2011	10	ND	--	--	ND	ND	ND	ND	2.14	--	--
B-7-15	Stantec	4/19/2011	15	1.1	--	--	0.0006	0.001	0.001	0.006	6.36	--	--
B-7-17	Stantec	4/19/2011	17	**35**	--	--	0.003	0.002	0.006	0.015	4.47	--	--
MW-6-10	Stantec	7/12/2011	10	ND	ND	43	ND	ND	ND	ND	--	--	--
MW-6-15	Stantec	7/12/2011	15	1.7	14	50	0.002	0.002	ND	ND	--	--	--
MW-7-5	Stantec	7/12/2011	5	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-7-15	Stantec	7/13/2011	15	ND	11	25	0.002	ND	ND	ND	--	--	--
MW-8-10	Stantec	7/12/2011	10	1	ND	29	ND	0.001	ND	0.012	--	--	--
MW-8-15	Stantec	7/12/2011	15	**110**	ND	ND	ND	ND	ND	0.077	--	--	--
MW-9-10	Stantec	7/12/2011	10	ND	860	**13,000**	0.002	0.002	ND	ND	--	**0.2567**	<0.073
MW-9-15	Stantec	7/12/2011	15	ND	200	**3,600**	0.002	0.001	ND	ND	--	**0.2735**	<0.078
MW-9-20	Stantec	7/12/2011	20	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-10-10	Stantec	7/13/2011	10	ND	ND	ND	ND	ND	ND	ND	--	--	--
MW-10-15	Stantec	7/13/2011	15	ND	ND	35	ND	ND	ND	ND	--	--	--

Notes:
MTCA = Model Toxics Control Act
bgs = below ground surface (in feet)
TPHg = Total petroleum hydrocarbons as gasoline
TPHd = Total petroleum hydrocarbons as diesel
TPHo = Total petroleum hydrocarbons as motor oil
BTEX = Benzene, toluene, ethylbenzene, and xylenes
VOCs = Volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
cPAHs = Carcinogenic PAHs
<x = Not detected at reporting limit x
ND = Not detected above the laboratory detection limit
-- = Not analyzed
ft = Feet below ground surface
NE = Not established
CRA sample IDs shortened to accommodate additional data.

a = Indicates analytes were not detected above the laboratory detection limits. However, the laboratory detection limits were above the MTCA Method A screening levels.
b = The sample chromatographic pattern for TPH does not match the specified standard. Quantitation of the unknown hydrocarbons was based on the specified standard.
c = The samples were additionally analyzed per halogenated volatile organic compounds (HVOCs) by EPA Method 8260C. Analyte concentrations were below laboratory reporting limits.

TABLE 1

SUMMARY OF SOIL ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

				HYDROCARBONS			PRIMARY VOCs				LEAD	PAHs	
Sample ID	Consultant	Sample Date	Sample Depth	TPHg	TPHd	TPHo	B	T	E	X	Total	Total cPAHs	Naphthalene
		MTCA Method A Screening Levels		30/100	2000	2000	0.03	7	6	9	250	0.1	5
	MTCA Method B Screening Levels (soil direct contact)			2645	2645	2645	18	6,400	8,000	16,000	NE	NE	1,600
			ft	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)

d = Indicates the sample is additional analyzed for purgeable and extractable petroleum hydrocarbons by Method NWTPH-VPH and NWTPH-EPH.
e = Analyte was detected in the associated method blank.
f = Method detection limit is used since laboratory reporting limit is raised to above the MTCA Method A screening levels due to sample matrix effects.
J = Results were evaluated to method detection limits. Concentrations greater than the method detection limits but less than the reporting limits, if found, are qualified with a "J" flag.
k = Sample received by laboratory outside the method required temperature.
l = Sample results reported on a wet weight basis.
m = Sample also analyzed for VPH/EPH per EPA Method NWVPH and NWEPH; naphthalene per EPA method 8260B, and n-hexane per EPA Method 9071b.
n = Sample also analyzed for full list VOCs per EPA Method 8260B. Please see applicable laboratory reports for more information.
o = Hydrocarbon pattern most resembles a diesel product.
p = Hydrocarbon pattern most resembles a motor oil product.
q = Hydrocarbon pattern most resembles a gasoline product.
r = The hydrocarbon pattern most closely resembles a gasoline and diesel product.
s = The hydrocarbon pattern most closely resembles a diesel and motor oil product.

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

		GROUNDWATER ELEVATIONS			*HYDROCARBONS*			*PRIMARY VOCs*						*OXYGENATES*	*METALS*	*PAHs*	
Sample ID	***Date***	***TOC***	***DTW***	***GWE***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***EDB***	***EDC***	***MTBE***	***Total Lead***	***Naphthalenes***	***cPAHs***
		MTCA Method A Screening Level			***800/1000***	***500***	***500***	***5***	***1000***	***700***	***1000***	***0.01***	***5***	***20***	***15***	***160***	***0.1***
					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***
B-1	4/19/2011	--	--	--	**1,700**	--	--	<0.5	<0.5	<0.5	1	<0.0095	<0.5	--	**18.5**	--	--
B-2	4/19/2011	--	--	--	**20,000**	--	--	<1	3	290	**5,100**	<0.0094	<1	--	**32.9**	--	--
B-3	4/19/2011	--	--	--	**3,400**	**100,000**	<3,400	1	28	33	150	<0.0095	<0.5	--	9.2	**570**	**0.165**
B-4	4/19/2011	--	--	--	<50	--	--	<0.5	<0.5	<0.5	<0.5	<0.0095	<0.5	--	**48.5**	--	--
B-5	4/19/2011	--	--	--	<50	**530**	<74	<0.5	<0.5	<0.5	<0.5	<0.0097	<0.5	--	**116**	<0.032	<0.0083
B-6	4/19/2011	--	--	--	**27,000**	--	--	<1	<1	330	**2,000**	<0.0093	<1	--	**18.4**	--	--
B-7	4/19/2011	--	--	--	**3,900**	--	--	0.6	7	140	570	<0.0098	<0.5	--	**15.7**	--	--
TB-1	4/19/2011	--	--	--	<50	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
TB-2	4/19/2011	--	--	--	<50	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
TB-3	4/19/2011	--	--	--	<50	--	--	---	---	---	---	--	--	--	--	--	--
TB-4	4/19/2011	--	--	--	<50	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
TB-5	4/19/2011	--	--	--	<50	--	--	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--
MW--1	08/19/2005	97.92	13.01	84.91	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--1	10/27/2005	97.92	12.62	85.3	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--1	12/27/2005	97.92	--	--	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--1	01/12/2006	97.92	9.03	88.89	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	03/02/2006	97.92	10.56	87.36	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--1	06/28/2006	97.92	12.42	85.5	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	12/01/2006	97.92	9.33	88.59	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	12/06/2006	97.92	9.72	88.2	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	02/28/2007	97.92	11.04	86.88	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	03/07/2007	97.92	11.14	86.78	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	04/11/2007	97.92	11.06	86.86	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--1	11/12/2009	97.92	11.08	86.84	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--	--	--	--	--
MW--1	08/30/2011[3]	97.92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	12/15/2011[3]	97.92	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--1	02/06/2012	62.35	9.84	52.51	260	430	**620**	<0.5	41	3	18	<1	<1	<0.5	--	<1	--
MW--1	05/30/2012	62.35	10.63	51.72	<50	35	170	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	1.7	<1	0.007399
MW--1	08/08/2012	62.35	11.36	50.99	<50	<29[4]	<67[4]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.32	<1	--
MW--2	08/19/2005	96.25	13.02	83.23	**2000**	--	--	ND	10	81	91	--	--	--	--	--	--
MW--2	10/27/2005	96.25	13.62	82.63	**2300**	--	--	ND	ND	89	93	--	--	--	--	--	--
MW--2	12/27/2005	96.25	--	--	**820**	--	--	ND	ND	21	66	--	--	--	--	--	--
MW--2	01/12/2006	96.25	5.77	90.48	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--2	03/02/2006	96.25	11.82	84.43	**1300**	--	--	ND	3.9	23	50	--	--	--	--	--	--
MW--2	04/13/2006	96.25	13.06	83.19	470	--	--	ND	1.4	6.9	15	--	--	--	--	--	--
MW--2	06/28/2006	96.25	12.4	83.85	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--2	09/11/2006	96.25	13.64	82.61	580	--	--	ND	1.6	2.9	6.2	--	--	--	--	--	--
MW--2	12/01/2006	96.25	10.65	85.6	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

		GROUNDWATER ELEVATIONS			*HYDROCARBONS*			*PRIMARY VOCs*						*OXYGENATES*	*METALS*	*PAHs*	
Sample ID	***Date***	***TOC***	***DTW***	***GWE***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***EDB***	***EDC***	***MTBE***	***Total Lead***	***Naphthalenes***	***cPAHs***
		MTCA Method A Screening Level			***800/1000***	***500***	***500***	***5***	***1000***	***700***	***1000***	***0.01***	***5***	***20***	***15***	***160***	***0.1***
					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***
MW--2	12/06/2006	96.25	10.2	86.05	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--2	01/12/2007	96.25	11.06	85.19	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--2	02/12/2007	96.25	--	--	**1400**	--	--	1.4	3.5	16	13	--	--	--	--	--	--
MW--2	02/28/2007	96.25	11.65	84.6	**1200**	--	--	2	4	18	60	--	--	--	--	--	--
MW--2	03/07/2007	96.25	11.43	84.82	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--2	04/11/2007	96.25	11.07	85.18	**1200**	--	--	ND	3	11	63	--	--	--	--	--	--
MW--2	11/12/2009	96.25	12.35	83.9	455	--	--	<1.0	<1.0	<1.0	<3.0	--	--	--	--	--	--
MW--2	08/31/2011	60.72	11.96	48.76	**960**	**590**	--	1	<0.7	1	6	<1	<1	<0.5	--	<1	--
MW--2	12/15/2011	60.72	11.53	49.19	750	30	--	1	<0.7	1	<1.6	<1	<1	<0.5	--	<1	--
MW--2	02/06/2012	60.72	10.26	50.46	780	390	--	1	2	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--2	05/30/2012	60.72	10.83	49.89	480	210	<67	0.8	<0.7	<0.8	<0.8	<1	<1	<0.5	3.8	<1	0.007173
MW--2	08/08/2012	60.72	11.95	48.77	670	**1604**	<67[4]	0.9	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	8.3	<1	--
MW--3	08/19/2005	97.43	12.72	84.71	**44000**	--	--	4.1	18	**780**	**3600**	--	--	--	--	--	--
MW--3	12/27/2005	97.43	13.42	84.01	**17000**	--	--	ND	38	580	**3000**	--	--	--	--	--	--
MW--3	12/28/2005	--	--	--	**6600**	--	--	**5**	22	200	**1100**	--	--	--	--	--	--
MW--3	01/12/2006	97.43	8.84	88.59	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--3	03/02/2006	97.43	10.9	86.53	**22000**	--	--	ND	26	450	**4200**	--	--	--	--	--	--
MW--3	04/13/2006	97.43	11.92	85.51	**33000**	--	--	ND	3	**700**	**3100**	--	--	--	--	--	--
MW--3	06/28/2006	97.43	12.17	85.26	**53000**	--	--	ND	17	530	**2600**	--	--	--	--	--	--
MW--3	08/13/2006	97.43	13.91	83.52	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--3	09/11/2006	97.43	13.77	83.66	**14000**	--	--	ND	5.6	180	**1100**	--	--	--	--	--	--
MW--3	10/13/2006	97.43	--	--	**1400**	--	--	ND	1	26	98	--	--	--	--	--	--
MW--3	11/17/2006	97.43	10.56	86.87	**48000**	--	--	ND	34	490	**4100**	--	--	--	--	--	--
MW--3	12/01/2006	97.43	9.78	87.65	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--3	12/06/2006	97.43	10.01	87.42	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--3	01/12/2007	97.43	10.9	86.53	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--3	02/12/2007	97.43	--	--	**36000**	--	--	ND	10	280	**1800**	--	--	--	--	--	--
MW--3	02/28/2007	97.43	11.12	86.31	**22000**	--	--	ND	6	200	**1400**	--	--	--	--	--	--
MW--3	03/07/2007	97.43	11.17	86.26	**21000**	--	--	ND	18	170	**1000**	--	--	--	--	--	--
MW--3	04/11/2007	97.43	11.04	86.39	**19000**	--	--	ND	6	110	**1100**	--	--	--	--	--	--
MW--3	11/12/2009	97.43	11.98	85.45	71.7	--	--	ND	<1.0	<1.0	<3.0	--	--	--	--	--	--
MW--3	08/31/2011	61.81	12.1	49.71	**7400**	370	<68	<1.0	<1	190	554	<2	<2	<1	--	67	--
MW--3	12/15/2011	61.81	11.38	50.43	**5400**	<29	<67	<0.5	<0.7	120	400	<1	<1	<0.5	--	50	--
MW--3	02/06/2012	61.81	10.33	51.48	**6300**	**1200**	<68	<1	<1	130	523	<2	<2	<1	--	49	--
MW--3	05/30/2012	61.81	10.87	50.94	**7400**	**520**	<66	<1	<1	160	660	<2	<2	<1	1.1	66	0.012868
MW--3	08/07/2012	61.81	11.42	50.39	**8100**	**2904**	<67[4]	<1	<1	140	610	<1	<1	<1	0.98	71	--
MW--4	06/28/2006	98.36	12.4	85.96	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--4	12/01/2006	98.36	9.9	88.46	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--4	12/06/2006	98.36	10.21	88.15	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

		GROUNDWATER ELEVATIONS			*HYDROCARBONS*			*PRIMARY VOCs*						*OXYGENATES*	*METALS*	*PAHs*	
Sample ID	***Date***	***TOC***	***DTW***	***GWE***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***EDB***	***EDC***	***MTBE***	***Total Lead***	***Naphthalenes***	***cPAHs***
		MTCA Method A Screening Level			***800/1000***	***500***	***500***	***5***	***1000***	***700***	***1000***	***0.01***	***5***	***20***	***15***	***160***	***0.1***
					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***
MW--4	02/28/2007	98.36	11.43	86.93	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--4	03/07/2007	98.36	11.49	86.87	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--4	04/11/2007	98.36	11.27	87.09	ND	--	--	ND	ND	ND	ND	--	--	--	--	--	--
MW--4	11/12/2009	98.36	11.82	86.54	<50	--	--	<1.0	<1.0	<1.0	<3.0	--	--	--	--	--	--
MW--4	08/31/2011	62.75	12.42	50.33	<50	<29	<68	<0.5	<0.7	<0.8	<0.8	<2	<2	<0.5	--	<1	--
MW--4	12/15/2011	62.75	11.69	51.06	<50	<29	<67	<0.5	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--4	02/06/2012	62.75	10.5	52.25	<50	55	<67	<0.5	<0.7	<0.8	<1.6	<2	<2	<0.5	--	<1	--
MW--4	05/30/2012	62.75	11.11	51.64	<50	<29	<67	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	1.8	<1	0.007248
MW--4	08/07/2012	62.75	11.76	50.99	<50	<29[4]	<68[4]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.34	<1	--
MW--5	06/28/2006	97.2	12.09	85.11	**21000**	--	--	ND	14	290	920	--	--	--	--	--	--
MW--5	09/11/2006	97.2	13.63	83.57	**2500**	--	--	ND	ND	34	60	--	--	--	--	--	--
MW--5	11/17/2006	97.2	10.57	86.63	**23000**	--	--	ND	52	450	**1700**	--	--	--	--	--	--
MW--5	12/01/2006	97.2	9.75	87.45	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--5	01/12/2007	97.2	10.85	86.35	--	--	--	--	--	--	--	--	--	--	--	--	--
MW--5	02/12/2007	97.2	--	--	**37000**	--	--	ND	33	**1600**	**2800**	--	--	--	--	--	--
MW--5	02/28/2007	97.2	11.05	86.15	**29000**	--	--	ND	24	550	**1800**	--	--	--	--	--	--
MW--5	03/07/2007	97.2	11.11	86.09	**42000**	--	--	**11**	24	**740**	**2500**	--	--	--	--	--	--
MW--5	04/11/2007	97.2	10.96	86.24	**65000**	--	--	ND	79	**850**	**4000**	--	--	--	--	--	--
MW--5	11/12/2009	97.2	12.1	85.1	**2340**	--	--	1	36	<1.0	125	--	--	--	--	--	--
MW--5	08/31/2011	61.66	12.8	48.86	**3100**	**770**	<67	2	1	72	124	<1	<1	<0.5	--	120	--
MW--5	12/15/2011	61.66	11.41	50.25	**1900**	66	<67	1	0.9	24	33	<1	<1	<0.5	--	81	--
MW--5	02/06/2012	61.66	10.54	51.12	**1200**	34	<68	0.8	<0.7	12	43	<1	<1	<0.5	--	37	--
MW--5	05/30/2012	61.66	10.91	50.75	260	54	<66	<0.5	<0.7	3	7	<1	<1	<0.5	0.48	12	0.009168
MW--5	08/07/2012	61.66	11.39	50.27	610	**1904**	<66[4]	<0.5	<0.5	11	22	<0.5	<0.5	<0.5	5.1	21	--
MW--6	08/31/2011	58.03	12.33	45.7	<50	44	<67	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	--	1	--
MW--6	12/15/2011	58.03	12.09	45.94	<50	<29	<67	<0.5	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--6	02/06/2012	58.03	11.8	46.23	<50	<29	<68	<0.5	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--6	05/30/2012	58.03	12.03	46	<50	<29	<68	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	2.5	<1	--
MW--6	08/07/2012	58.03	12.21	45.82	<50	<28[4]	<66[4]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.15	<1	--
MW--7	08/31/2011	56.96	11.15	45.81	<50	<29	<67	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	--	<1	--
MW--7	12/15/2011	56.96	10.93	46.03	<50	45	89	<0.5	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--7	02/06/2012	56.96	10.75	46.21	<50	<29	<68	<0.5	2	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--7	05/30/2012	56.96	10.93	46.03	<50	37	160	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	13.8	<1	0.097
MW--7	08/07/2012	56.96	11.7	45.26	<50	<28[4]	<66[4]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**31.7**	<1	--
MW--8	08/31/2011	61.71	12.01	49.7	**4400**	240	<67	<0.5	<0.7	41	442	<1	<1	<0.5	--	33	--
MW--8	12/15/2011	61.71	11.25	50.46	**8100**	96	<67	<0.5	<0.7	79	880	<1	<1	<0.5	--	72	--
MW--8	02/06/2012	61.71	10	51.71	**13000**	290	<69	<1	<1	110	**1280**	<2	<2	<1	--	89	--
MW--8	05/30/2012	61.71	10.69	51.02	**9500**	**700**	<68	<1	<1	110	**1300**	<2	<2	<1	7.1	96	0.007324

TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL DATA
FORMER TIDEWATER SITE
PHILLIPS 66 SITE 5173
CHEVRON SITE 301233
2800 MLK JR WAY S.
SEATTLE, WASHINGTON

		GROUNDWATER ELEVATIONS			*HYDROCARBONS*			*PRIMARY VOCs*						*OXYGENATES*	*METALS*	*PAHs*	
Sample ID	***Date***	***TOC***	***DTW***	***GWE***	***TPHg***	***TPHd***	***TPHo***	***B***	***T***	***E***	***X***	***EDB***	***EDC***	***MTBE***	***Total Lead***	***Naphthalenes***	***cPAHs***
		MTCA Method A Screening Level			***800/1000***	***500***	***500***	***5***	***1000***	***700***	***1000***	***0.01***	***5***	***20***	***15***	***160***	***0.1***
					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***
MW--8 DUP	05/30/2012	61.71	10.69	51.02	**10000**	450	<66	<1	<1	110	**1300**	<2	<2	<1	5.3	93	0.007248
MW--8	08/08/2012	61.71	11.3	50.41	**9300**	**2904**	<66[4]	<1	<1	92	850	<1	<1	<1	3.4	73	--
MW--8 DUP	08/08/2012	61.71	11.3	50.41	**11000**	**2404**	<66[4]	<1	<1	83	710	<1	<1	<1	3.6	67	--
MW--9	08/31/2011	62.58	14.29	48.29	<50	78	<68	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	--	<1	--
MW--9	12/15/2011	62.58	13.01	49.57	<50	<29	<67	<0.5	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--9	02/06/2012	62.58	12.04	50.54	66	<300	<700[1]	<0.5	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--9	05/30/2012	52.58	12.53	40.05	66	<29	<67	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	0.31	<1	0.007248
MW--9	08/08/2012	62.58	13.37	49.21	<50	<29[4]	<67[4]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.87	<1	--
MW--10	08/31/2011	58.96	11.94	47.02	<50	260	100	2	<0.7	<0.8	<0.8	<1	<1	<0.5	--	<1	--
MW--10	12/15/2011	58.96	11.13	47.83	51	<28	<66	3	<0.7	<0.8	0.8	<1	<1	<0.5	--	<1	--
MW--10	02/06/2012	58.96	10.44	48.52	<50[2]	<29	<68	1	<0.7	<0.8	<1.6	<1	<1	<0.5	--	<1	--
MW--10	05/30/2012	58.96	10.77	48.19	<50	74	<66	<0.5	<0.7	<0.8	<0.8	<1	<1	<0.5	0.46	<1	0.007248
MW--10 DUP	05/30/2012	58.96	10.77	48.19	--	--	--	--	--	--	--	--	--	--	0.49	--	--
MW--10	08/07/2012	58.96	11.41	47.55	110	**1304**	<68[4]	1	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.034	<1	--

Notes:
TPH-DRO = Total petroleum hydrocarbons - diesel range organics
TPH-HRO = Total petroleum hydrocarbons - oil range organics
VOCS = Volatile organic compounds
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylene
Xylenes = o-xylene + m,p-xylene
BTEX = Benzene, toluene, ethylbenzene, and xylenes analyzed by EPA Method 8260B; except the April 25, 1990 sample from EW-1 analyzed by EPA Method 8020
EDB = 1,2 Dibromoethane analyzed by EPA Method 8011
EDC = 1,2 Dichloroethane analyzed by EPA Method 8260B
MTBE = Methyl tert butyl ether
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons analyzed by EPA Method 8270c Selective Ion Monitoring
Total Lead analyzed by EPA Method 6020
-- = Not available / not applicable.I286
<x = Not detected above laboratory method detection limit.
1 Reporting limits were raised due to interference from the sample matrix. The surrogate data is outside the QC limits due to unresolvable matrix problems evident in the sample chromatogram.
2 A preserved vial was submitted for analysis. However, the pH at the time of analysis was 4.
3 Well not sampled - well not found.
4 Analysis with silica-gel cleanup.

Appendix A

King County Assessor Records, Chronological Listing of Operations

Appendix A – Chronological Listing of Operations at 2800 MLK Jr. Way S., Seattle, WA	
Business Operations	***Approximate Years of Site Occupation***
Service station	1955 - 1965
Service station	1965 – 1967
Service station	1967 – 1973
Vacant	1974 – 1986
Service station	1986 – 1990
Unknown	1990 - 1994
Auto service	1994 – 1996
Auto service	1996 – 2004
Vacant	2004 - 2010
Auto detail	2010 - Present

New Search | Property Tax Bill | Map This Property | Glossary of Terms | Area Report | Print Property Detail

PARCEL DATA

Parcel	000360-0055	Jurisdiction	SEATTLE
Name	HOOE HOLDINGS LLC	Levy Code	0010
Site Address	2800 MARTIN LUTHER KING JR WAY S 98144	Property Type	C
Geo Area	40-50	Plat Block / Building Number	
Spec Area	0-0	Plat Lot / Unit Number	
Property Name	AUTO DETAILING	Quarter-Section-Township-Range	SE-9 -24-4

Legal Description

HANFORD E-D C # 44 N 125 FT OF FOLG-BEG AT PT ON S LN OF MCCLELLAN ST N 89-59-15 E 528.79 FT FRM NELY LN OF RAINIER AVE TH S 00-06-05 W 286.99 FT TH S 89-52-27 W 75 FT M/L TO ELY LN OF EMPIRE WAY TH NLY ALG SD LN 287 FT M/L TO S LN OF MCCLELLAN ST TH N 89-59-15 E 70.22 FT M/L TO BEG TGW LOTS 1 & 2 BLK 2 PETERS GARDENS ADD LESS E 95 FT THOF

LAND DATA

Highest & Best Use As If Vacant	MIXED USE	Percentage Unusable	0
Highest & Best Use As Improved	INTERIM USE	Unbuildable	NO
Present Use	Service Station	Restrictive Size Shape	NO
Base Land Value SqFt	60	Zoning	NC1-40
Base Land Value	651,200	Water	WATER DISTRICT
% Base Land Value Impacted	100	Sewer/Septic	PUBLIC
Base Land Valued Date	12/24/2012	Road Access	PUBLIC
Base Land Value Tax Year	2014	Parking	ADEQUATE
Land SqFt	10,854	Street Surface	PAVED
Acres	0.25		

Views

Rainier	
Territorial	
Olympics	
Cascades	
Seattle Skyline	
Puget Sound	
Lake Washington	
Lake Sammamish	
Lake/River/Creek	
Other View	

Waterfront

Waterfront Location	
Waterfront Footage	
Lot Depth Factor	
Waterfront Bank	
Tide/Shore	
Waterfront Restricted Access	
Waterfront Access Rights	NO
Poor Quality	
Proximity Influence	NO

Designations

Historic Site	
Current Use	
Nbr Bldg Sites	
Adjacent to Golf Fairway	NO
Adjacent to Greenbelt	NO
Other Designation	NO
Deed Restrictions	NO
Development Rights Purchased	NO
Easements	NO
Native Growth Protection Easement	NO
DNR Lease	NO

Nuisances

Topography	YES
Traffic Noise	HIGH
Airport Noise	
Power Lines	NO
Other Nuisances	NO

Problems

Water Problems	NO
Transportation Concurrency	NO
Other Problems	NO

Environmental

Environmental	NO

BUILDING

Reference L

- King C Links
- Propert Advisor
- Washin Departm Revenu link)
- Washin Board o Appeals link)
- Board o Appeals
- District
- iMap
- Record
- Scanne surveys map do
- Scanne plats

Building Number	1
Building Description	AUTO DETAILING
Number Of Buildings Aggregated	1
Predominant Use	MIXED USE RETAIL (830)
Shape	Rect or Slight Irreg
Construction Class	MASONRY
Building Quality	AVERAGE
Stories	1
Building Gross Sq Ft	1,326
Building Net Sq Ft	1,326
Year Built	1955
Eff. Year	1970
Percentage Complete	100
Heating System	SPACE HEATERS
Sprinklers	No
Elevators	

Click the camera to see more pictures.

Picture of Building 1

Section(s) Of Building Number: 1

Section Number	Section Use	Description	Stories	Height	Floor Number	Gross Sq Ft	Net Sq Ft
1	MIXED USE RETAIL (830)		1	12		1,326	1,326

TAX ROLL HISTORY

Account	Valued Year	Tax Year	Omit Year	Levy Code	Appraised Land Value	Appraised Imps Value	Appraised Total Value	New Dollars	Taxable Land Value	Taxable Imps Value	Taxable Total Value	Tax Value Reason
000360005508	2012	2013		0010	$521,000	$1,000	$522,000	$0	$521,000	$1,000	$522,000	
000360005508	2011	2012		0010	$521,000	$1,000	$522,000	$0	$521,000	$1,000	$522,000	
000360005508	2010	2011		0010	$521,000	$1,000	$522,000	$0	$521,000	$1,000	$522,000	
000360005508	2009	2010		0010	$651,200	$1,000	$652,200	$0	$651,200	$1,000	$652,200	
000360005508	2008	2009		0010	$542,700	$1,000	$543,700	$0	$542,700	$1,000	$543,700	
000360005508	2007	2008		0010	$434,100	$1,000	$435,100	$0	$434,100	$1,000	$435,100	
000360005508	2006	2007		0010	$271,300	$1,000	$272,300	$0	$271,300	$1,000	$272,300	
000360005508	2005	2006		0010	$217,000	$1,000	$218,000	$0	$217,000	$1,000	$218,000	
000360005508	2004	2005		0010	$216,900	$1,000	$217,900	$0	$216,900	$1,000	$217,900	
000360005508	2003	2004		0010	$216,900	$1,000	$217,900	$0	$216,900	$1,000	$217,900	
000360005508	2002	2003		0010	$217,000	$21,700	$238,700	$0	$217,000	$21,700	$238,700	
000360005508	2001	2002		0010	$217,000	$21,700	$238,700	$0	$217,000	$21,700	$238,700	
000360005508	2000	2001		0010	$217,000	$21,700	$238,700	$0	$217,000	$21,700	$238,700	
000360005508	1999	2000		0010	$217,000	$21,700	$238,700	$0	$217,000	$21,700	$238,700	
000360005508	1998	1999		0010	$95,000	$21,700	$116,700	$0	$95,000	$21,700	$116,700	
000360005508	1997	1998		0010	$0	$0	$0	$0	$75,900	$21,800	$97,700	
000360005508	1996	1997		0010	$0	$0	$0	$0	$75,900	$21,800	$97,700	
000360005508	1994	1995		0010	$0	$0	$0	$0	$75,900	$12,000	$87,900	
000360005508	1992	1993		0010	$0	$0	$0	$0	$70,500	$11,600	$82,100	
000360005508	1990	1991		0010	$0	$0	$0	$0	$70,500	$11,600	$82,100	
000360005508	1988	1989		0010	$0	$0	$0	$0	$70,500	$11,600	$82,100	
000360005508	1986	1987		0010	$0	$0	$0	$0	$70,500	$11,600	$82,100	
000360005508	1984	1985		0010	$0	$0	$0	$0	$70,500	$11,600	$82,100	
000360005508	1983	1984		0010	$0	$0	$0	$0	$54,800	$20,000	$74,800	
000360005508	1982	1983		0010	$0	$0	$0	$0	$50,000	$20,000	$70,000	

SALES HISTORY

Excise Number	Recording Number	Document Date	Sale Price	Seller Name	Buyer Name	Instrument	Sale Reason
2289142	20070605000433	6/4/2007	$650,000.00	BIESOLD BRUCE+PHYLLIS	HOOE HOLDINGS LLC	Statutory Warranty Deed	None

REVIEW HISTORY

Tax Year	Review Number	Review Type	Appealed Value	Hearing Date	Settlement Value	Decision	Status
2011	1007451	Local Appeal	$652,200	1/5/2012	$522,000	REVISE, ASSESSOR RECOMMENDED	Completed

PERMIT HISTORY

Permit Number	Permit Description	Type	Issue Date	Permit Value	Permit Status	Issuing Jurisdiction	Reviewed Date
6284423	Change of occupancy only (no construction this permit),	Remodel	2/10/2012	$1,000	Complete	SEATTLE	7/18/2012
3009397	Land Use App. to allow a 2-story 7,562 medical service bldg. (medical/dental) and 18 parking sp.	Building, New	3/17/2010	$0	Revisit	SEATTLE	7/18/2012

HOME IMPROVEMENT EXEMPTION

Appendix B

Terrestrial Ecological Evaluation Exclusion Form

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION EXCLUSION FORM

Under the Model Toxics Control Act (MTCA), a Terrestrial Ecological Evaluation (TEE) is not required if the Site meets the criteria in WAC 173-340-7491 for an exclusion. If you determine that your Site does not require a TEE, please complete this form and submit it to the Department of Ecology (Ecology) at the appropriate time, either with your VCP Application or with a subsequent request for a written opinion. Please note that exclusion from the TEE does not exclude the Site from an evaluation of aquatic or sediment ecological receptors.

If your Site does not meet the criteria for exclusion under WAC 173-340-7491, then you may have to conduct a simplified TEE in accordance with WAC 173-340-7492 or a site-specific TEE in accordance with WAC 173-340-7493. If you have questions about conducting a simplified or site-specific TEE, please contact the Ecology site manager assigned to your Site or the appropriate Ecology regional office.

Step 1: IDENTIFY HAZARDOUS WASTE SITE AND EVALUATOR

Please identify below the hazardous waste site for which you are documenting an exclusion from conducting a TEE and the name of the person who conducted the evaluation.

Facility/Site Name: Former Tidewater Service Station	
Facility/Site Address: 2800 MLK Jr. Way S., Seattle, WA	
Facility/Site No: 42746846	VCP Project No.: NW2612
Name of Evaluator: Matthew Davis	

Step 2: DOCUMENT BASIS FOR EXCLUSION

The bases for excluding a site from a terrestrial ecological evaluation are set forth in WAC 173-340-7491(1). Please identify below the basis for excluding your Site from further evaluation. Please check all that apply.

POINT OF COMPLIANCE – WAC 173-340-7491(1)(A)

1-☐ No contamination present at site.

2-☐ All contamination is 15 feet below ground level prior to remedial activities.

3-☐ All contamination is six feet below ground level and an institutional control has been implemented as required by WAC 173-340-440.

4-☐ All contamination is below a site-specific point of compliance established in compliance with WAC 173-340-7490(4)(b) with an institutional control implemented as required by WAC 173-340-440. ***Please provide documentation that describes the rationale for setting a site-specific point of compliance.***

BARRIERS TO EXPOSURE – WAC 173-340-7491(1)(b)

5-☐ 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 an institutional control has been implemented as required by WAC 173-340-440. *An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.*

Step 2: DOCUMENT BASIS FOR EXCLUSION continued

UNDEVELOPED LAND – WAC 173-340-7491(1)(c)

"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.

6-☐ There is less than one-quarter acre 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.

7-☒ For sites not containing any of the chemicals mentioned above, there is less than one-and-a-half acres of contiguous undeveloped land on or within 500 feet of any area of the Site.

BACKGROUND CONCENTRATIONS – WAC 173-340-7491(1)(d)

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

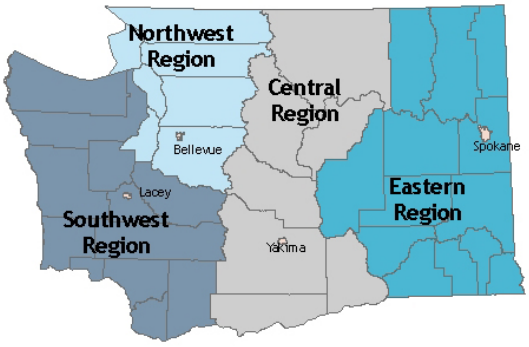
Step 3: PROVIDE EXPLANATION FOR EXCLUSION (IF NECESSARY)

The site is fully paved with asphalt or concrete. None of the chemicals listed in point 6 (above) are present at the site and there is less than one-and-one-half acres of contiguous undeveloped land on or within 500 feet of any area of the Site (see attached map).

Attach additional pages if necessary.

Step 4: SUBMITTAL

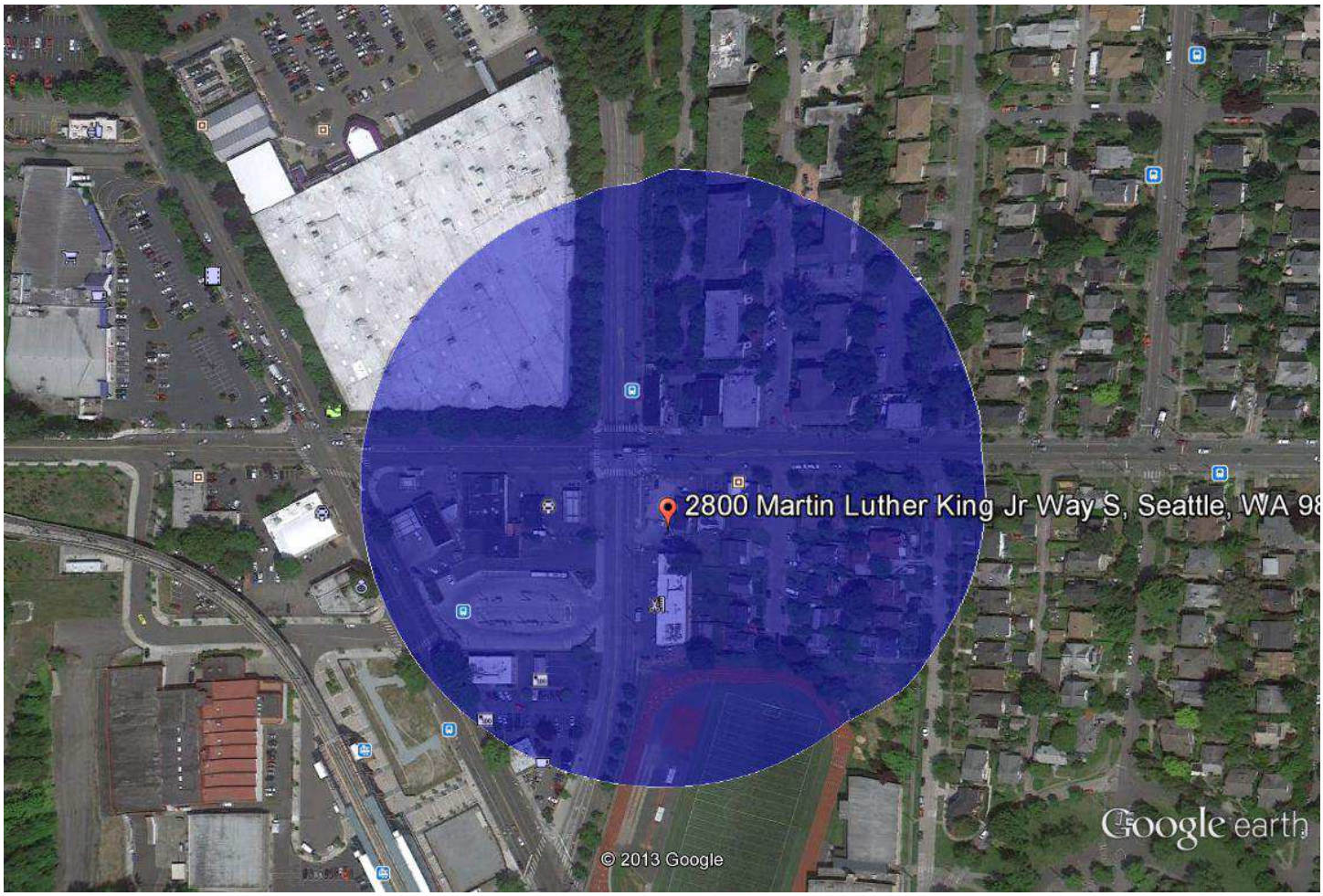
Please mail your completed form to Ecology at the appropriate time, either with your VCP Application or with a subsequent request for a written opinion. If you complete the form after you enter the VCP, please mail your completed form to the Ecology site manager assigned to your Site. If a site manager 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: Sara Maser 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: Mark Dunbar 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: Scott Rose P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Patti Carter N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

ECY 090-300 (revised July 2008)



Google earth

feet 1000
meters 300

Appendix C

Available Soil Boring Logs

01-0356-b-gl1.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Slighty silty sand in cuttings				
8 11			Sand. Lt. Brown, damp, Gravelly Silty Sand (Fill)	80			
12		GL1-5	Medium Dense.		SW		
4 11				80			
14		GL1-10	Sand. Gray, damp, Gravelly Sand. Medium Dense.		SM		
4 8			Sand. Moist to Wet, Oxidized, gray to brown gravelly	75			
12		GL1-15	sand. Medium Dense				
		No Sample	Sand Gray, wet silty gravelly sand. Very Dense (Till)	10			
50/6			Bottom of boring at approximately 20.5'				

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:	
Drilling Company: Cascade Drilling	Weather: Sunny	Groundwater sample GL-1 collected by peristaltic pump through a temporary well screen	
Boring Diameter: Four Inches	Page 1 of 1		
Logged By: Rob Roberts			

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-1

01-0356-b-gl2.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Sand. Lt. Brown silty sand in cuttings. Slight petroleum odor.				
11 12 9		GL2-4	Sand Lt Brown, damp, Gravelly Sand (Fill) Medium Dense. No Odors.	90	SW		
6 7 10		GL2-9	Same as above.	80			
3 4 4		GL2-14	Sand. Moist to Wet, dark brown silty sand (native). Loose.	60	SM		
12 20 21		GL2-19	Same as above. Dense, Wet.	50			
			Bottom of boring at approximately 19.5'				

Depth in feet

Drilling Method:	Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company:	Cascade Drilling	Weather: Sunny	
Boring Diameter:	Four inches	Page 1 of 1	
Logged By:	Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-2

01-0356-b-gl3.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Sand. Lt. Brown and gray sand in cuttings. No petroleum odor.				
5 5 9		GL3-6	Sand. Gray, damp, Silty gravelly Sand. Medium Dense. No Odors.	75	SM		
3 3 4		GL3-11	Same as above. Loose.	80			
			Bottom of boring at approximately 11'				

0 5 10 15 20 25 30

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four inches	Page 1 of 1	
Logged By: Rob Roberts		

g logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-3

01-0356-b-gl4.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
5 5 6		GL4-4	Sand. Lt. Brown and gray, damp, slightly gravelly, sl. silty Sand. Medium Dense.	80	SP		
3 6 12		GL4-9	Same as above.	70			
4 5 7		GL4-14	Same as above. Moist to wet. ▽	70			
6 12 19		GL4-19	Clay. Green Silty Clay. Hard		CL		
			Bottom of boring at approximately 19'				

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:	
Drilling Company: Cascade Drilling	Weather: Sunny	Groundwater sample GL-4 collected by peristaltic pump through a temporary well screen	
Boring Diameter: Four Inches	Page 1 of 1		
Logged By: Rob Roberts			

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-4

01-0356-b-gl5.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Difficult drilling. Brick and concrete rubble. (Fill)				
50/2		GL5-10	Sand. Lt. Brown, damp, Gravelly Sand (Fill) with concrete and petroleum staining. Very Dense.	5	SW		
30 50/6		GL5-12.5	Same as above. Dark brown petroleum-stained sand at 12.5 feet.	25			
41 50/6		GL5-15	Same as above. More petroleum staining, strong odor. Wet at 15'.	25			
21		GL5-19	Same as above.				
50/6		GL5-20	Silt. Gray, damp Silt. Hard (Till). No odor or sheen.	25	ML		
			Bottom of boring at approximately 20'				

Depth in feet

Drilling Method: Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company: Cascade Drilling	Weather: Sunny	
Boring Diameter: Four Inches	Page 1 of 1	
Logged By: Rob Roberts		

g logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-5

01-0355-b-gl6.vsd

BLOWS/6 inches	INTERVAL	SAMPLE NUMBER	SOIL DESCRIPTION	Recovery %	USCS	PID (ppmv in headspace)	WELL CONSTRUCTION
			Dark brown Sand with 20% to 50% brick and concrete in cuttings.		SW		
50/2		No Recovery					
70/6		GL6-15	Sand. Black Sand. Very Dense. No odor, no sheen.	25			
50/2		No Recovery					
29			Sand. Wet silty clayey Sand. Very Dense.		SC		
32							
50		GL6-20	Clay. Gray silty clay. Hard.	25	CL		
			Bottom of boring at approximately 20'				

Depth in feet

Drilling Method:	Hollow-stem auger	Date: 2-9-2005	Other Information:
Drilling Company:	Cascade Drilling	Weather: Sunny	
Boring Diameter:	Four inches	Page 1 of 1	
Logged By:	Rob Roberts		

g-logics

Boring Log
Former Gas Station
2800 Martin Luther King Way S.
Seattle, WA

GL-6

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-1** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **11.5**
STATIC DTW (ft): **11.0**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **18.0**
BOREHOLE DEPTH (ft): **18.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Weathered Ashpalt/Gravel Road Base							Native Slough
		ML	**SANDY SILT** ; ML; gray; low plasticity; firm; moist; no odor; iron oxide staining; few small subrounded gravels		1100 NS			0.0		
5		SP	**SAND WITH SILT** ; SP; greenish brown; medium dense; moist; no odor; trace fine to small subrounded gravels; non-cohesive		1145 B-1 @ 5'			7.0	5	
					945 NS			0.0		
10					945 B-1 @ 10'			0.0	10	Bentonite Chips
			Same as above; light brown; wet							
		CL	**SANDY CLAY** ; CL; brown; low plasticity; firm; moist; slight odor; some small rounded gravels; gray mottling							
15					955 B-1 @ 15'			91.0	15	
		ML	**SILT WITH SAND** ; ML; dark brown; low plasticity; firm; wet; no odor; some small rounded gravels; many fine plant roots							
			Same as above; increase in sand; decrease in plant roots		1000 B-1 @ 18'			1.0		
			Borehole terminated at 18 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-2** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **12.0**
STATIC DTW (ft): **10.25**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **18.0**
BOREHOLE DEPTH (ft): **18.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Gravel Road Base							Native Slough
		ML	**SILT WITH FINE SAND** ; ML; brown; low plasticity; firm; moist; no odor; Trace small subrounded gravel; some asphalt debris at 1 ft bgs		1040 NS			0.0		
			Same as above; no gravels; light gray; iron oxide staining; firm							
5			**SANDY SILT** ; no odor; some construction debris		1045 B-2 @ 5'			0.0	5	
					1050 NS			0.0		
			6" gravel lens							Bentonite Chips
10		SP	**SAND WITH SILT** ; SP; brown; medium dense; moist; no odor; no gravels; non cohesive						10	
					920 B-2 @ 11'			0.0		
			Same as above; decrease in silt							
			Same as above; wet							
15					925 B-2 @ 15'			1,100	15	
			Same as above; some small subrounded gravels							
			SAND WITH CLAY ; moist; slight odor							
		ML	**SILT WITH SAND** ; ML; very dark brown; low plasticity; firm; moist; no odor; no gravels		935 B-2 @18'			24		
			Borehole terminated at 18 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-3** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **16.5**
STATIC DTW (ft): **11.75**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Gravel Road Base/Construction Debris							Native Slough
		ML	**SILT WITH SAND** ; ML; dark brown; low plasticity; soft; moist; no odor; some small subrounded gravels; construction debris at 1.75 ft bgs		1510 NS			0.0		
			Same as above; light brown; increase in sand; stiff; some fine plant roots							
			Some construction debris at 3.75 ft bgs							
5					1510 B-3 @ 5'			0.0	5	
			Some construction debris at 6 ft bgs							
			Some construction debris at 7 ft bgs							
		SP	**SAND** ; SP; gray; medium dense; moist; slight odor; no gravels; non-cohesive; trace fines							
10					835 B-3 @ 10'			37.0	10	Bentonite Chips
			Same as above; trace fine plant roots							
			Same as above; very dark brown; HC staining							
15					845 B-3 @ 15'			110	15	
			SAND WITH CLAY ; wet; iron oxide staining							
			Same as above; olive green with gray mottling							
			Same as above; decrease in odor; dense							
20					900 B-3- @ 20'			2.0	20	
			Borehole terminated at 20 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-4** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **12.0**
STATIC DTW (ft): **11.75**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **17.0**
BOREHOLE DEPTH (ft): **17.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Apshalt/Road Base							Native Slough
		ML	**SILT WITH TRACE SAND** ; ML; brown; low plasticity; firm; moist; no odor; no gravels							
			SILT WITH CLAY ; dark brown		1510 NS			0.0		
			Same as above; decrease in clay; some fine subangular gravels; moist; trace plant roots							
5					1510 B-4 @ 5'			0.0	5	
			Asphalt/construction debris from 6 to 7 ft bgs							
		ML	**SILT WITH CLAY** ; ML; dark brown; firm							
			Same as above; very dark brown							Bentonite Chips
10					810 B-4 @ 10'			0.0	10	
		GP	**GRAVEL WITH SAND** ; GP; wet; no odor; subangular medium to coarse gravel; trace fines							
15					815 B-4 @ 15'			0.0	15	
		SP	**SAND** ; SP; gray; dense; wet; no odor; no gravels; non-cohesive; some plant roots							
		CL	**CLAY WITH SAND** ; CL; brown; low plasticity; wet; no odor; no gravels; some plant roots		825 B-4 @ 17'			0.0		
		SP	**SAND** ; SP; gray; dense; wet; no odor; no gravels; non-cohesive; some plant roots							
			Borehole terminated at 17 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-5** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **13.0**
STATIC DTW (ft): **11.50**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **18.0**
BOREHOLE DEPTH (ft): **18.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Asphalt/Road Base							Native Slough
		ML	**SANDY SILT** ; ML; grayish brown; low plasticity; soft; moist; no odor; trace small subrounded gravels		1210 NS			0.0		
5		SP	**SAND WITH SILT** ; SP; gray; medium dense; moist; no odor; trace fine subrounded gravels; non-cohesive		1210 B-5 @ 5'			0.0	5	
			Sa,e as above; trace iron oxide staining		1210 NS			0.0		
10			**SANDY SILT** ; light brown; low plasticity; firm; moist; no odor; no gravels		1010 B-5 @ 10'			0.0	10	Bentonite Chips
			Same as above; wet							
15		SP	**SAND WITH SILT** ; SP; light gray; medium dense; wet; no odor; few small subrounded gravels; wood debris		1020 B-5 @ 15'			0.0	15	
		ML	**SILT** ; ML; very dark brown; low plasticity; firm; wet; no odor; few small subrounded gravels; wood debris							
		SP	**SAND** ; SP; gray; dense; wet; no odor; trace small gravels; non-cohesive		1030 B-5 @18			0.0		
			Borehole terminated at 18 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-6** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **12.0**
STATIC DTW (ft): **10.75**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **17.0**
BOREHOLE DEPTH (ft): **17.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Asphalt/Road Base							Native Slough
		ML	**SANDY SILT** ; ML; light brown; low plasticity; firm; moist; no odor; trace small subrounded gravels		1730 NS			0.0		
		SP	**SAND WITH SILT** ; SP; grayish brown; medium dense; moist; no odor; trace small to fine subrounded gravels							
5			Same as above; increase in gravels		1730 B-6 @ 5'			0.0	5	
					1730 NS			0.0		
			Brown							Bentonite Chips
			Very moist							
10					1100 B-6 @10'			6.0	10	
			Wet; slight HC odor							
			Gray; iron oxide staining; HC odor							
15					1110 B-6 @ 15'			1,880	15	
			Increase in silt							
			SILT ; dark brown; low plasticity; wet; no odor; no gravels; wood debris		1120 B-6 @ 17'			7.6		
			Borehole terminated at 17 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 Martin Luther King Way, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **B-7** PAGE 1 OF 1

Stantec

DRILLING / INSTALLATION:
STARTED **4/18/11** COMPLETED: **4/19/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Geoprobe 8040**
DRILLING METHOD: **Direct Push**
SAMPLING EQUIPMENT: **PID**

NORTHING (ft):
LAT:
GROUND ELEV (ft):
INITIAL DTW (ft): **12.5**
STATIC DTW (ft): **10.75**
WELL CASING DIA. (in): **--**
LOGGED BY: **RM**

EASTING (ft):
LONG:
TOC ELEV (ft):
WELL DEPTH (ft): **17.0**
BOREHOLE DEPTH (ft): **17.0**
BOREHOLE DIA. (in): **3**
CHECKED BY: **DS**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
			Concrest/Gravel Road Base							Native Slough
		ML	**SANDY SILT** ; ML; brown; low plasticity; firm; moist; no odor; trace fine subrounded gravels							
			Grayish brown; trace iron oxide staining		1640 NS			0.0		
		SP	**SAND WITH SILT** ; SP; brown; medium dense; moist; no odor; iron oxide staining; gray mottling; trace small subrounded gravels; non-cohesive							
5					1640 B-7 @ 5'			0.0	5	
			Decrease in silt; very moist							
					1640 NS			0.0		
			Brown							Bentonite Chips
10					1140 B-7 @ 10'			0.0	10	
			Wet; increase in gravels							
			Increase in silt							
15					1150 B-7 @ 15'			0.0	15	
		ML	**SILT** ; ML; very dark brown; low plasticity; wet; no odor; no gravels; wood debris							
					1200 B-7 @ 17'			13.0		
			Borehole terminated at 17 feet.							

GEO FORM 304 B-1 THROUGH B-7.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 11/3/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-10** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/13/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 65**
DRILLING METHOD: **HSA (Limited access rig)**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 39.8"**
GROUND ELEV (ft): **59.28**
INITIAL DTW (ft): **16.0**
STATIC DTW (ft): **11.50**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 45.8"**
TOC ELEV (ft): **58.96**
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1450 (7/11/11)			12" Concrete/road base							Concrete
		ML	**SANDY SILT** ; ML; gray; low plasticity; firm; moist; iron oxide staining; trace small subrounded gravels; no odor				N/A (air knife to 8' bgs)			
1515 (7/11/11)			**SILT WITH CLAY** ; greenish gray; medium plasticity; trace brown mottles; increase in iron oxide staining		1515 MW-10-5'			6.3	5	Bentonite; 2" dia. sch. 40 PVC (blank)
			Gray; hard to very stiff; increase in sand				11 16 15			
855 (7/13/11)					855 MW-10-10'			14.0	10	
							18 45 25			Sand
905 (7/13/11)					905 MW-10-15'			12.6	15	2" dia. sch. 40 PVC (0.020" slot)
			Wet							
		SP	**SAND** ; SP; gray; medium-grained; dense; wet; no gravels; no odor				16 35 36			
916 (7/13/11)			Borehole terminated at 20 feet.		916 MW-10-20'			8.0	20	

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-6** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/12/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 40.5"**
GROUND ELEV (ft): **58.44**
INITIAL DTW (ft): **12.0**
STATIC DTW (ft): **12.15**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 46.8"**
TOC ELEV (ft): **58.03**
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
830 (7/12/11)			12" Concrete/road base							Concrete
		ML	**SILT WITH FINE SAND** ; ML; gray; low plasticity; firm; moist; no gravels; no odor							
		SP	**SILTY SAND** ; SP; brown; medium dense; moist; trace small subrounded gravels; no odor		910 MW-6-5'		N/A (air knife to 8' bgs)	16.1	5	Bentonite; 2" dia. sch. 40 PVC (blank)
910 (7/12/11) 5										
		ML	**SILT WITH SAND** ; ML; gray; medium plasticity; soft; moist; trace brown mottles; some fine rounded gravels; no odor; trace fine roots		1330 MW-6-10'		2 2 2	0.5	10	
1330 (7/12/11) 10										
			Wet; many small-medium subbrounded gravels							Sand
			Very dark brown; many medium roots		1340 MW-6-15'		2 5 9	1.8	15	2" dia. sch. 40 PVC (0.020" slot)
1340 (7/12/11) 15										
		CL	**CLAY** ; CL; gray; low plasticity; firm; moist; no gravels; no odor		1355 MW-6-20'		2 4 6	0.5	20	
1355 (7/12/11) 20			Borehole terminated at 20 feet.							

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-7** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/12/11** COMPLETED: **7/13/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 65**
DRILLING METHOD: **HSA (Limited access rig)**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 39.9"**
GROUND ELEV (ft): **57.38**
INITIAL DTW (ft): **12.00**
STATIC DTW (ft): **11.00**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 46.8"**
TOC ELEV (ft): **56.96**
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1030 (7/12/11)			12" concrete/road base							Concrete
		ML	**SANDY SILT** ; ML; grayish brown; low plasticity; firm; moist; no gravels; no odor							
1110 (7/12/11	5				1110 MW-7-5'		N/A (air knife to 8' bgs)	14.6	5	Bentonite 2" dia. sch. 40 PVC (blank)
1115 (7/13/11)	10		No recovery at 10'						10	
			Wet							
1130 (7/13/11)	15		Dark brown; some small-medium subrounded gravels		1130 MW-7-15'		4 5 9	6.9	15	Sand 2" dia. sch. 40 PVC (0.020" slot)
		CH	**CLAY** ; CH; gray; high plasticity; soft; wet; no gravels; no odor; trace small roots				3 7 9	0.7		
1145 (7/13/11)	20		Borehole terminated at 20 feet.		1145 MW-7-20'				20	

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-8** PAGE 1 OF 1

DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 41"**
GROUND ELEV (ft): **62.13**
INITIAL DTW (ft): **14.0**
STATIC DTW (ft): **11.40**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 45.5"**
TOC ELEV (ft): **61.71**
WELL DEPTH (ft): **20.0**
BOREHOLE DEPTH (ft): **20.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)	Well Construction
1300 (7/11/11)			12" Weathered asphalt/road base							Concrete
			SANDY SILT WITH GRAVEL ; brown; low plasticity; firm; moist; some small-medium subrounded gravels; no odor; trace fine roots (Fill)							
			Concrete debris				N/A (air knife to 8' bgs)			
1330 (7/11/11)			**SAND WITH SILT** ; grayish brown; medium dense; moist; iron oxide staining; few small subrounded gravels; no odor; concrete debris (Fill)		1330 MW-8-5'			0.0	5	Bentonite; 2" dia. sch. 40 PVC (blank)
			Gray; loose; no gravels				3 3 4			
1050 (7/12/11)					1050 MW-8-10'			10.5	10	
			Wet; few medium subrounded gravels				3 3 5			Sand
1100 (7/12/11)					1100 MW-8-15'			56.5	15	2" dia. sch. 40 PVC (0.020" slot)
			Greenish gray; trace fine roots				5 8 19			
1115 (7/12/11)			Borehole terminated at 20 feet.		1115 MW-8-20'			11.6	20	

GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

PROJECT: **Tidewater Seattle**
LOCATION: **2800 MLK Way South, Seattle, WA**
PROJECT NUMBER: **211602274**

WELL / PROBEHOLE / BOREHOLE NO: **MW-9** PAGE 1 OF 1

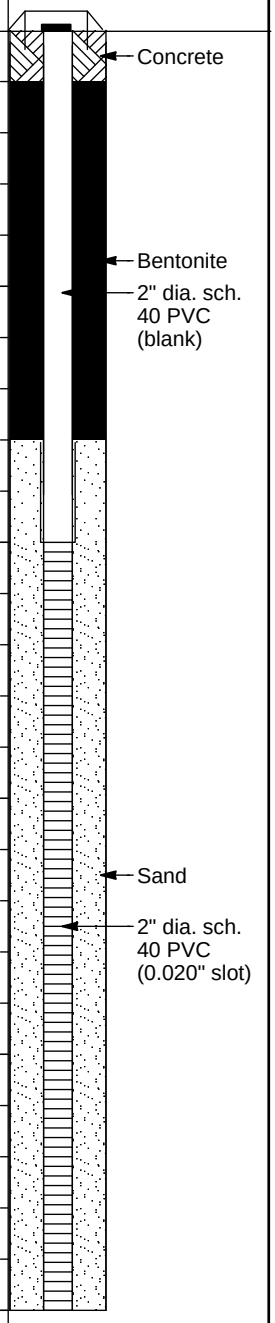
DRILLING / INSTALLATION:
STARTED **7/11/11** COMPLETED: **7/12/11**
DRILLING COMPANY: **Cascade Drilling**
DRILLING EQUIPMENT: **Air Knife/CME 75**
DRILLING METHOD: **HSA**
SAMPLING EQUIPMENT: **Split spoon/PID**

NORTHING (ft):
LAT: **47° 34' 40.6"**
GROUND ELEV (ft): **63.07**
INITIAL DTW (ft): **NE**
STATIC DTW (ft): **14.00**
WELL CASING DIA. (in): **2**
LOGGED BY: **RM**

EASTING (ft):
LONG: **122° 17' 44.9"**
TOC ELEV (ft): **62.58**
WELL DEPTH (ft): **25.0**
BOREHOLE DEPTH (ft): **25.0**
BOREHOLE DIA. (in): **8.25**
CHECKED BY: **JD**

Time & Depth (feet)	Graphic Log	USCS	Description	Sample	Time Sample ID	Measured Recov. (feet)	Blow Count	Headspace PID (units)	Depth (feet)
1030 (7/11/11)			12" Asphalt/roadbase						
			SILT WITH SAND ; dark brown; low plasticity; soft; moist; some small subrounded gravels; no odor; concrete/brick debris at 2.5' bgs (Fill)				N/A (air knife to 5.5' bgs)		
			Construction debris with brown silt matrix - weathered concrete and bricks up to 6"x6"x3"						
1200 5 (7/11/11)			**POORLY GRADED GRAVEL WITH SILT AND SAND** ; moist; no odor; predominately fill gravel and construction debris (Fill)		1200 MW-9-5'			0.5	5
			SANDY SILT WITH GRAVEL ; dark brown; low plasticity; very stiff to hard; moist; many small subangular gravels; no odor (Fill)				8 24 37		
830 10 (7/12/11)					830 MW-9-10'			15.4	10
			Few small subangular gravels; increase in moisture				9 14 15		
845 15 (7/12/11)					845 MW-9-15'			4.3	15
			Gray; no gravels; increase in moisture				12 20 30		
855 20 (7/12/11)					855 MW-9-20'			0.7	20
			SAND ; gray; very dense; moist; no gravels; no odor (Fill)						
905 25 (7/12/11)			Borehole terminated at 25 feet.		905 MW-9-25'		50 for 6"	0.9	25

Well Construction



GEO FORM 304 MW-6 THROUGH MW-10.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 9/9/11

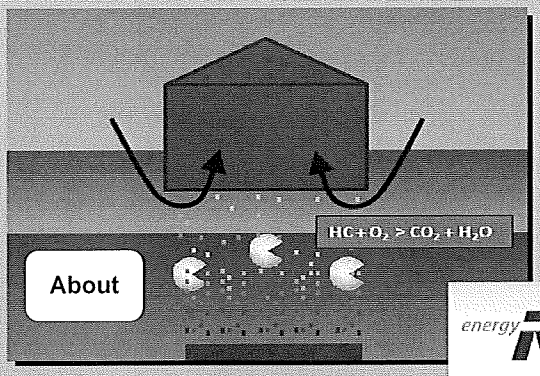
Appendix D

Vapor Intrusion Modeling Results

BioVapor

A 1-D vapor intrusion Model:

with Oxygen-Limited Aerobic Biodegradation



About

energy API

1) PROJECT INFORMATION

Site ID #:	Chevron 301233
Address:	2800 MLK, Seattle, WA
Completed by:	ML
Date:	28-Oct-13
Job ID:	61992

BioVapor Version 2.0

2) INPUT SCREENS

1) Environmental Factors

2) Chemicals

3) Chemical Concentrations

Chemical Database

3) RESULTS SCREENS

1) VI Risk

2) Subsurface Profile

3) Detailed Results

Site Name: Chevron 301233
Address: 2800 MLK, Seattle, WA

BioVapor Input

Date: 10/28/2013
Completed By:ML
Project No.: 61992

Model Input Screens: Environmental Factors | Chemicals | Chemical Concentrations | Chemical Database

1. Oxygen Surface Boundary Condition

Slab or Basement Foundation (e.g., Specify Airflow)

2. Indoor Target Criteria

- (●) Do not perform backward Calculation
- ( ) Based on Indoor Risk / Hazard Target
- ( ) Specified Indoor Air Concentration Target

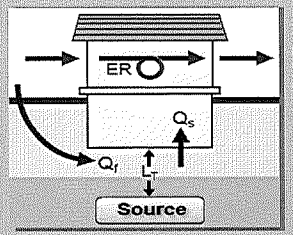
Note: Target indoor air concentrations can be edited on the "Chemical Database" screen

3. Exposure and Risk Factors

Target Hazard Quotient For Individual Chemicals	THQ	1.00	(-)
Target Excess Individual Lifetime Cancer Risk	TR	1.00E-06	(-)
Carcinogen Averaging Time	AT_C	70.00	yrs
Non-carcinogenic Averaging Time	AT_{NC}	25.00	yrs
Body Weight - Adult	BW	70.00	kg
Exposure Duration	ED	25.00	yrs
Exposure Frequency	EF	250.00	days/yr
Indoor Inhalation Rate Exposure Adjustment	CF	1.00	(-)

Legend

80.00	Calculated Value
80.00	User Input Value
80.00	Value Outside Normal Range



4. Building Parameters

Indoor Mixing Height	L_{mix}	300.00	cm
Air Exchange Rate	ER	12.00	1/day
Foundation Thickness	L_{crack}	15.00	cm
Foundation Area	A_b	10080000.00	cm^2
Foundation Crack Fraction	η	3.77E-04	cm^2-cracks/cm^2-total
Total Porosity (Soil-filled Cracks)	$\theta_{T\text{-}crack}$	1.00	cm^3-void/cm^3-soil
Water Filled Porosity (Soil-filled Cracks)	$\theta_{w\text{-}crack}$	0.00	cm^3-void/cm^3-soil
Airflow Through Basement Foundation	Q_s	83.00	cm^3-air/sec
Building Envelope Resistance	L_{mix} * ER	0.04	cm/sec

5. Vadose Zone Parameters

Soil Porosity	$\theta_{T\text{-}soil}$	0.38	cm^3-void/cm^3-soil
Soil Water Content	$\theta_{w\text{-}soil}$	0.05	cm^3-water/cm^3-soil
Soil Organic Carbon Fraction	f_{oc}	5.00E-03	cm^3-void/cm^3-soil
Soil Density - Bulk	ρS	1.70	g-soil/cm^3-soil
Airflow Under Foundation	Q_f	83.00	cm^3-air/sec
Depth of Aerobic Zone Under Foundation	L_A	-	cm
O_2 Concentration Under Foundation	Co_2-e	-	%
Annual Median Soil Temperature	T	10.00	°C
Baseline Soil Oxygen Respiration Rate (Calculated from Foc)	Λ_{base}	9.780E-08	mg-O_2 / g-soil - sec
Depth to Source (from bottom of foundation)	LT	326.00	cm
Minimum O_2 Conc. For Aerobic Biodegradation		1.00	%

6. Commands and Options

Default Values
- ( ) Residential
- (●) Commercial / Industrial

Paste | Home | Print | Reset | Next

Model Output Screens: VI Risk | Subsurface Profile | Detailed Results

Commands and Options: Home | Print | Previous | Next | Unprotect | ?

Target Hazard Quotient	Target Risk Level
1	1.00E-06

Forward Risk Calculation

Chemical Name	Groundwater Source Concentration ug/L	Soil Gas Source Concentration ug/m³	Soil Gas to Indoor Air Attenuation Factor (-)	Target Indoor Air Concentration ug/m³-air	Predicted Indoor Air Concentration ug/m³-air	Hazard Quotient (-)	Risk Level (-)
benzene	1.00E+00	1.16E+01	7.46E-05	3.20E-01	8.64E-04	1.97E-05	1.21E-09
ethylbenzene	1.10E+02	1.53E+03	7.39E-05	4.60E+02	1.13E-01	7.74E-05	-
toluene	1.00E+00	1.28E+01	7.83E-05	2.20E+03	1.00E-03	1.72E-06	-
xylenes (mixed isomers)	1.30E+03	1.19E+04	5.55E-05	4.60E+01	6.62E-01	4.54E-03	-
naphthalene	9.60E+01	6.37E+01	8.10E-06	1.40E+00	5.16E-04	1.18E-04	-

NOTE A: "< 1E-100" means calculated attentuation factor is less than 1E-100

Backward Risk Calculation

Critical Chemical for Backward Risk Calculation: Not Selected

Chemical Name	Target Hazard Quotient (-)	Target Cancer Risk (-)	Target Indoor Air Concentration ug/m³-air	Soil Gas Source Concentration ug/m³	Effective Saturated Vapor Concentration ug/m³	Groundwater Source Concentration ug/L	Effective Solubility ug/L
benzene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
ethylbenzene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
toluene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
xylenes (mixed isomers)	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
naphthalene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected

NOTE B: Target indoor air concentrations can be edited on the "Chemical Database" screen

NOTE C: Red value indicates source concentration greater than saturation limit

NOTE D: Backward Risk Calculation not applicable when aerobic depth directly specified

NOTE E: Backward Calculation not completed due to Excel calculation error

Site Name: Chevron 301233
Address: 2800 MLK, Seattle, WA

BioVapor Results

Date: 10/28/2013
Completed By: ML
Project No.: 61992

Model Output Screens: VI Risk | Subsurface Profile | Detailed Results

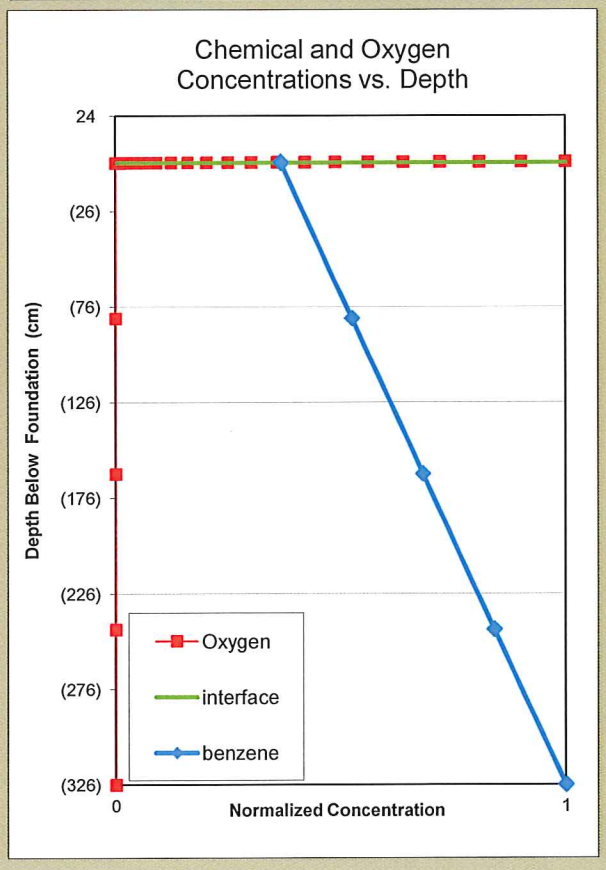
Commands and Options: Home | Print | Previous | Next | ?

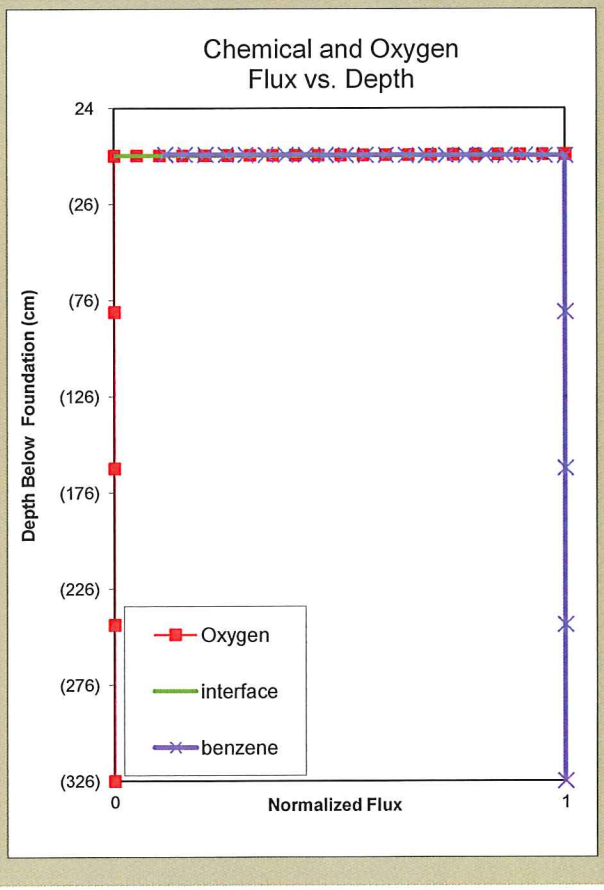
Select Chemical to View: benzene

Update Charts

Results Charts (Forward Calculation)

Predicted concentration profile below building foundation





BioVapor Results

Chemical	Concentration in indoor air	Concentration in sub-slab gas	Concentration at aerobic/anaerobic interface	Concentration at source	Concentration in indoor air (if no biodegradation)	Flux into enclosure	Flux from source
	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/sec	ug/sec
benzene	8.64E-04	4.27E+00	4.27E+00	1.16E+01	1.96E-03	3.63E-04	3.2E-03
ethylbenzene	1.13E-01	5.64E+02	5.66E+02	1.53E+03	2.50E-01	4.74E-02	3.6E-01
toluene	1.00E-03	4.96E+00	4.97E+00	1.28E+01	2.17E-03	4.21E-04	3.4E-03
xylenes (mixed isomers)	6.62E-01	3.32E+03	3.33E+03	1.19E+04	1.93E+00	2.78E-01	3.1E+00
naphthalene	5.16E-04	2.60E+00	2.66E+00	6.37E+01	9.85E-03	2.17E-04	1.8E-02
TPH-GRO (C6-C10)	4.54E+03	2.21E+07	2.21E+07	3.68E+07	6.45E+03	1.91E+03	7.4E+03
TPH-DRO (>C10-C28)	7.64E+02	3.72E+06	3.72E+06	6.63E+06	1.16E+03	3.21E+02	1.5E+03
Totals	5.31E+03	2.59E+07	2.59E+07	4.34E+07	7.61E+03	2.23E+03	8.81E+03

Chemical	Oxygen Demand in Vadose Zone	Minimum O_2 Concentration at top of aerobic zone (i.e., below building foundation)	Oxygen mass flow at the top of aerobic zone
	% of total demand	%	ug/sec
benzene	0.00%		
ethylbenzene	0.00%		
toluene	0.00%		
xylenes (mixed isomers)	0.04%		
naphthalene	0.00%		
TPH-GRO (C6-C10)	77.87%		
TPH-DRO (>C10-C28)	17.34%		
Baseline Soil Oxygen Demand	4.75%		
Totals	100.00%	1.00%	2.29E+04

Site Name: Chevron 301233
Address: 2800 MLK, Seattle, WA

BioVapor Results

Date: 10/28/2013
Completed By: ML
Project No.: 61992

Model Output Screens: VI Risk | Subsurface Profile | Detailed Results

Commands and Options: Home | Print | Previous | Unprotect | ?

General Results - Forward Calculations

Depth from building foundation to aerobic/anaerobic interface	Depth from aerobic/anaerobic interface to source	Total Depth
cm	cm	cm
0.65	325.35	326.00

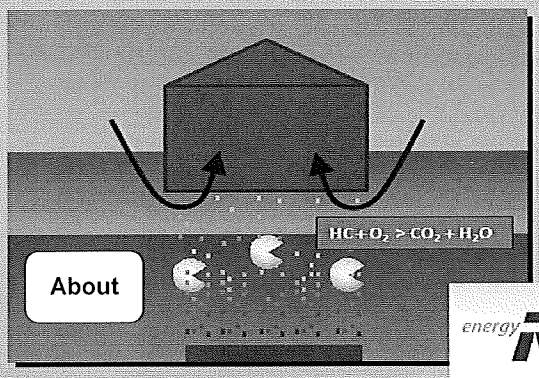
Chemical Specific Results - Forward Calculations

Chemical	Foundation Mass Transfer Resistance	Soil Resistance	Sub-slab to indoor air attenuation factor	Aerobic/anaerobic interface to sub-slab attenuation factor	Source to aerobic/anaerobic interface attenuation factor	Source to indoor air attenuation factor	Source to indoor air attenuation factor (if no biodegradation)
	cm/sec	cm/sec	(-)	(-)	(-)	(-)	(-)
benzene	8.44E-06	4.36E-05	2.03E-04	9.98E-01	3.69E-01	7.46E-05	1.70E-04
ethylbenzene	8.34E-06	3.72E-05	2.00E-04	9.98E-01	3.70E-01	7.39E-05	1.63E-04
toluene	8.43E-06	4.31E-05	2.02E-04	9.98E-01	3.88E-01	7.83E-05	1.69E-04
xylenes (mixed isomers)	8.32E-06	3.54E-05	2.00E-04	9.97E-01	2.79E-01	5.55E-05	1.62E-04
naphthalene	8.27E-06	2.93E-05	1.98E-04	9.77E-01	4.18E-02	8.10E-06	1.55E-04
TPH-GRO (C6-C10)	8.56E-06	4.97E-05	2.05E-04	9.99E-01	6.02E-01	1.24E-04	1.75E-04
TPH-DRO (>C10-C28)	8.56E-06	4.96E-05	2.05E-04	9.99E-01	5.62E-01	1.15E-04	1.75E-04

BioVapor

A 1-D vapor intrusion Model:

with Oxygen-Limited Aerobic Biodegradation



About

energy API

1) PROJECT INFORMATION

Site ID #:	Chevron 301233-MW10
Address:	2800 MLK, Seattle, WA
Completed by:	ML
Date:	28-Oct-13
Job ID:	61992

BioVapor Version 2.0

2) INPUT SCREENS

1) Environmental Factors

2) Chemicals

3) Chemical Concentrations

Chemical Database

3) RESULTS SCREENS

1) VI Risk

2) Subsurface Profile

3) Detailed Results

Site Name: Chevron 301233
Address: 2800 MLK, Seattle, WA

BioVapor Input

Date: 10/28/2013
Completed By:ML
Project No.: 61992

Model Input Screens: Environmental Factors | Chemicals | Chemical Concentrations | Chemical Database

1. Oxygen Surface Boundary Condition

Slab or Basement Foundation (e.g., Specify Airflow)

2. Indoor Target Criteria

- (●) Do not perform backward Calculation
- ( ) Based on Indoor Risk / Hazard Target
- ( ) Specified Indoor Air Concentration Target

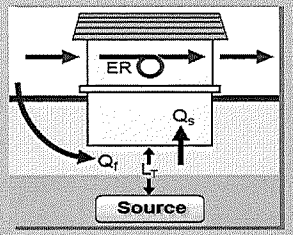
Note: Target indoor air concentrations can be edited on the "Chemical Database" screen

3. Exposure and Risk Factors

Target Hazard Quotient For Individual Chemicals	THQ	1.00	(-)
Target Excess Individual Lifetime Cancer Risk	TR	1.00E-06	(-)
Carcinogen Averaging Time	AT_C	70.00	yrs
Non-carcinogenic Averaging Time	AT_{NC}	25.00	yrs
Body Weight - Adult	BW	70.00	kg
Exposure Duration	ED	25.00	yrs
Exposure Frequency	EF	250.00	days/yr
Indoor Inhalation Rate Exposure Adjustment	CF	1.00	(-)

Legend

- 80.00 Calculated Value
- 80.00 User Input Value
- 80.00 Value Outside Normal Range



4. Building Parameters

Indoor Mixing Height	L_{mix}	300.00	cm
Air Exchange Rate	ER	12.00	1/day
Foundation Thickness	L_{crack}	15.00	cm
Foundation Area	A_b	5570000.00	cm^2
Foundation Crack Fraction	η	3.77E-04	cm^2-cracks/cm^2-total
Total Porosity (Soil-filled Cracks)	$\theta_{T\text{-}crack}$	1.00	cm^3-void/cm^3-soil
Water Filled Porosity (Soil-filled Cracks)	$\theta_{w\text{-}crack}$	0.00	cm^3-void/cm^3-soil
Airflow Through Basement Foundation	Q_s	83.00	cm^3-air/sec
Building Envelope Resistance	L_{mix} * ER	0.04	cm/sec

5. Vadose Zone Parameters

Soil Porosity	$\theta_{T\text{-}soil}$	0.38	cm^3-void/cm^3-soil
Soil Water Content	$\theta_{w\text{-}soil}$	0.05	cm^3-water/cm^3-soil
Soil Organic Carbon Fraction	f_{oc}	5.00E-03	cm^3-void/cm^3-soil
Soil Density - Bulk	ρs	1.70	g-soil/cm^3-soil
Airflow Under Foundation	Q_f	83.00	cm^3-air/sec
Depth of Aerobic Zone Under Foundation	L_A	-	cm
O_2 Concentration Under Foundation	Co_2-e	-	%
Annual Median Soil Temperature	T	10.00	°C
Baseline Soil Oxygen Respiration Rate (Calculated from Foc)	Λ_{base}	9.780E-08	mg-O_2 / g-soil - sec
Depth to Source (from bottom of foundation)	LT	318.00	cm
Minimum O_2 Conc. For Aerobic Biodegradation		1.00	%

6. Commands and Options

Default Values
- ( ) Residential
- (●) Commercial / Industrial

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Site Name: Chevron 301233
Address: 2800 MLK, Seattle, WA

BioVapor Results

Date: 10/28/2013
Completed By: ML
Job ID: 61992

Model Input Screens
Environmental Factors | Chemicals | Chemical Concentrations
Chemical Database

2. Commands and Options

?

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1. Ground Water Source Chemical Concentrations

Chemical	ug/L
benzene	3.00E+00
ethylbenzene	7.00E-01
toluene	8.00E-01
xylenes (mixed isomers)	1.60E+00
naphthalene	1.00E+00
TPH-GRO (C6-C10)	1.10E+02
TPH-DRO (>C10-C28)	1.30E+03

1.42E+03 Total Entered Hydrocarbon Concentration (ug/L)

Note: The total hydrocarbon concentration should equal the total concentration of all hydrocarbons in the source area

3. Attenuation Factor

0.1 Groundwater to Deep Soil Gas Attenuation Factor

Model Output Screens: VI Risk | Subsurface Profile | Detailed Results

Commands and Options ?

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Target Hazard Quotient	Target Risk Level
1	1.00E-06

Forward Risk Calculation

Chemical Name	Groundwater Source Concentration	Soil Gas Source Concentration	Soil Gas to Indoor Air Attenuation Factor	Target Indoor Air Concentration	Predicted Indoor Air Concentration	Hazard Quotient	Risk Level
	ug/L	ug/m³	(-)	ug/m³-air	ug/m³-air	(-)	(-)
benzene	3.00E+00	3.47E+01	4.57E-06	3.20E-01	1.59E-04	3.62E-06	2.22E-10
ethylbenzene	7.00E-01	9.73E+00	4.70E-06	4.60E+02	4.58E-05	3.14E-08	-
toluene	8.00E-01	1.03E+01	5.18E-06	2.20E+03	5.31E-05	9.09E-08	-
xylenes (mixed isomers)	1.60E+00	1.47E+01	2.33E-06	4.60E+01	3.42E-05	2.34E-07	-
naphthalene	1.00E+00	6.63E-01	6.43E-09	1.40E+00	4.27E-09	9.74E-10	-

NOTE A: "< 1E-100" means calculated attentuation factor is less than IE-100

Backward Risk Calculation

Critical Chemical for Backward Risk Calculation: Not Selected

Chemical Name	Target Hazard Quotient	Target Cancer Risk	Target Indoor Air Concentration	Soil Gas Source Concentration	Effective Saturated Vapor Concentration	Groundwater Source Concentration	Effective Solubility
	(-)	(-)	ug/m³-air	ug/m³	ug/m³	ug/L	ug/L
benzene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
ethylbenzene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
toluene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
xylenes (mixed isomers)	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected
naphthalene	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected	Not Selected

NOTE B: Target indoor air concentrations can be edited on the "Chemical Database" screen

NOTE C: Red value indicates source concentration greater than saturation limit

NOTE D: Backward Risk Calculation not applicable when aerobic depth directly specified

NOTE E: Backward Calculation not completed due to Excel calculation error

Site Name: Chevron 301233
Address: 2800 MLK, Seattle, WA

BioVapor Results

Date: 10/28/2013
Completed By: ML
Project No.: 61992

Model Output Screens: VI Risk | Subsurface Profile | Detailed Results

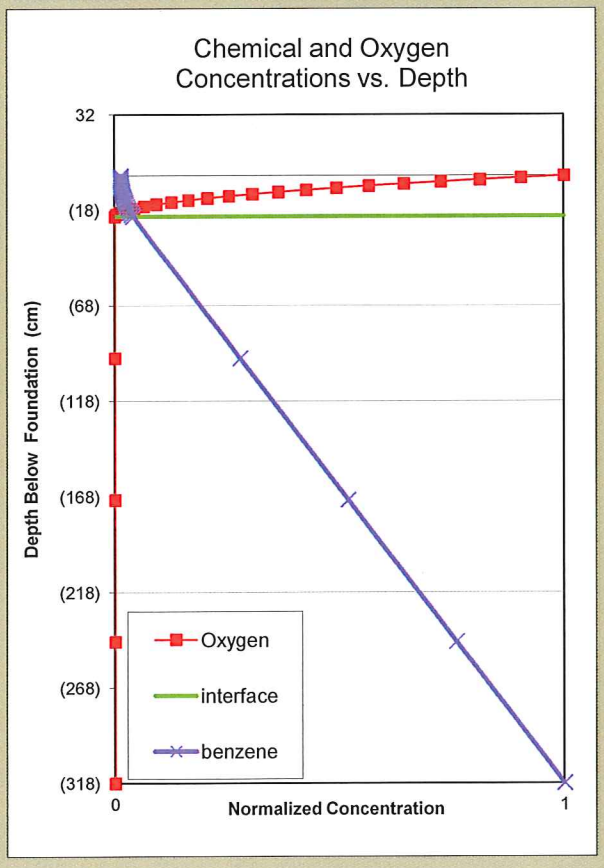
Commands and Options: Home | Print | Previous | Next | ?

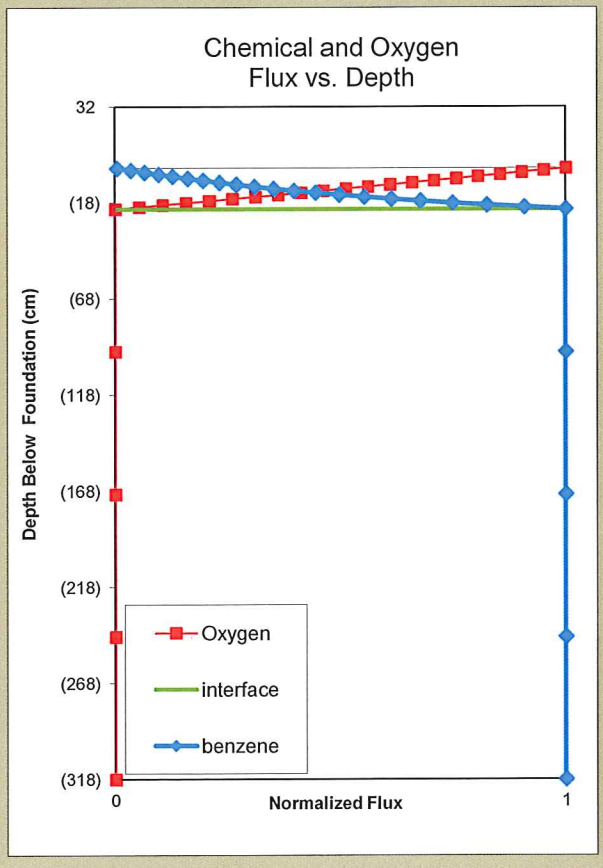
Select Chemical to View: benzene

Update Charts

Results Charts (Forward Calculation)

Predicted concentration profile below building foundation





Model Output Screens: VI Risk | Subsurface Profile | Detailed Results

Commands and Options: Home | Print | Previous | Unprotect | ?

General Results - Forward Calculations

Depth from building foundation to aerobic/anaerobic interface	Depth from aerobic/anaerobic interface to source	Total Depth
cm	cm	cm
21.26	296.74	318.00

Chemical Specific Results - Forward Calculations

Chemical	Foundation Mass Transfer Resistance	Soil Resistance	Sub-slab to indoor air attenuation factor	Aerobic/anaerobic interface to sub-slab attenuation factor	Source to aerobic/anaerobic interface attenuation factor	Source to indoor air attenuation factor	Source to indoor air attenuation factor (if no biodegradation)
	cm/sec	cm/sec	(-)	(-)	(-)	(-)	(-)
benzene	1.49E-05	4.47E-05	3.58E-04	3.17E-01	4.02E-02	4.57E-06	2.69E-04
ethylbenzene	1.49E-05	3.81E-05	3.58E-04	3.23E-01	4.07E-02	4.70E-06	2.57E-04
toluene	1.49E-05	4.42E-05	3.58E-04	3.42E-01	4.23E-02	5.18E-06	2.68E-04
xylenes (mixed isomers)	1.49E-05	3.63E-05	3.58E-04	2.06E-01	3.15E-02	2.33E-06	2.54E-04
naphthalene	1.49E-05	3.00E-05	3.58E-04	1.78E-03	1.01E-02	6.43E-09	2.39E-04
TPH-GRO (C6-C10)	1.49E-05	5.10E-05	3.59E-04	6.27E-01	8.24E-02	1.85E-05	2.77E-04
TPH-DRO (>C10-C28)	1.49E-05	5.08E-05	3.59E-04	5.71E-01	7.10E-02	1.45E-05	2.77E-04

BioVapor Results

Chemical	Concentration in indoor air	Concentration in sub-slab gas	Concentration at aerobic/anaerobic interface	Concentration at source	Concentration in indoor air (if no biodegradation)	Flux into enclosure	Flux from source
	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/m^3-air	ug/sec	ug/sec
benzene	1.59E-04	4.43E-01	1.40E+00	3.47E+01	9.33E-03	3.68E-05	8.9E-03
ethylbenzene	4.58E-05	1.28E-01	3.97E-01	9.73E+00	2.50E-03	1.06E-05	2.1E-03
toluene	5.31E-05	1.48E-01	4.34E-01	1.03E+01	2.74E-03	1.23E-05	2.6E-03
xylenes (mixed isomers)	3.42E-05	9.57E-02	4.63E-01	1.47E+01	3.73E-03	7.94E-06	3.1E-03
naphthalene	4.27E-09	1.19E-05	6.70E-03	6.63E-01	1.59E-04	9.90E-10	1.2E-04
TPH-GRO (C6-C10)	5.77E+00	1.61E+04	2.56E+04	3.11E+05	8.63E+01	1.34E+00	8.7E+01
TPH-DRO (>C10-C28)	4.33E+01	1.21E+05	2.11E+05	2.98E+06	8.25E+02	1.01E+01	8.4E+02
Totals	4.91E+01	1.37E+05	2.37E+05	3.29E+06	9.11E+02	1.14E+01	9.26E+02

Chemical	Oxygen Demand in Vadose Zone	Minimum O_2 Concentration at top of aerobic zone (i.e., below building foundation)	Oxygen mass flow at the top of aerobic zone
	% of total demand	%	ug/sec
benzene	0.00%		
ethylbenzene	0.00%		
toluene	0.00%		
xylenes (mixed isomers)	0.00%		
naphthalene	0.00%		
TPH-GRO (C6-C10)	1.31%		
TPH-DRO (>C10-C28)	13.73%		
Baseline Soil Oxygen Demand	84.96%		
Totals	100.00%	1.11%	2.29E+04