



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

Northwest Regional Office • 3190 160th Ave SE • Bellevue, WA 98008-5452 • 425-649-7000  
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

June 6, 2016

Mr. John Eliason, Development Director  
King County Housing Authority  
600 Andover Park West  
Tukwila, WA 98188

**Re: Further Action at the following Site:**

- **Site Name:** Park Lake Homes Maintenance Shop
- **Site Address:** 9800 8<sup>th</sup> Avenue SW, Seattle, WA 98106
- **Cleanup Site ID:** 8417
- **Facility/Site No.:** 24359391
- **VCP Project No.:** NW3033

Dear Mr. Eliason:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Park Lake Homes Maintenance Shop facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

**Issue Presented and Opinion**

---

Is further remedial action necessary to clean up contamination at the Site?

**YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.**

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively “substantive requirements of MTCA”). The analysis is provided below.

**Description of the Site**

---

This opinion applies only to the Site described below. The Site as characterized to date is defined by the nature and extent of contamination associated with the following releases:

- Benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons



(TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as oil (TPHo) releases in Soil.

The Site is more particularly described in **Enclosure A** to this letter, which includes detailed Site diagrams. The description of the Site is based solely on the information contained in the documents listed below in this letter.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcels associated with this Site are affected by other sites.

### **Basis for the Opinion**

---

This opinion is based on the information contained in the following documents:

1. Emery Bayley, *Site Check/Site Assessment Report, Removal of Underground Storage Tank at Park Lake Homes Maintenance Shop, 9900 8<sup>th</sup> Ave. SW, Seattle, Washington*, January 7, 1999.
2. GeoEngineers, *Maintenance Center Environmental Soil Sampling, Former Park Lake Homes, 9900 8<sup>th</sup> Avenue Southwest, Seattle, Washington*, April 14, 2004.
3. GeoEngineers, *Final Cleanup Report, KCHA Maintenance Facility, Former Park Lake Homes, 9900 8<sup>th</sup> Avenue SW, Seattle, Washington*, September 7, 2005.
4. GeoEngineers, *Post-Cleanup Groundwater Confirmation Sampling Event, King County Housing Authority Former Park Lake Homes Maintenance Center, 9800 8<sup>th</sup> Avenue SW, Seattle, Washington*, October 27, 2015.

The reports listed above will be kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Appointments can be made by calling the NWRO resource contact at 425.649.7235 or sending an email to [nwro\\_public\\_request@ecy.wa.gov](mailto:nwro_public_request@ecy.wa.gov).

### **Analysis of the Cleanup**

---

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

#### **1. Characterization of the Site.**

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action, as documented by the following discussion and request for additional information:

- Please provide Ecology with paper and electronic copies of the Phase I Environmental Site Assessment (ESA) dated January 15, 2003, which is mentioned in documents 2, 3, and 4 in the prior “Basis for the Opinion” section of this letter.

The identification of potential historical contamination sources in the Phase I ESA is an important component of Site characterization that is not currently available for Ecology review.

- The ground water flow direction and chemical characteristics at the Site have not been sufficiently characterized. Data from the Site investigation reports document the presence of ground water in 10 of the 15 direct-push borings at depths of 4 to 10 feet below ground surface (bgs) in 2004, and ground water seepage in remedial excavations EX2 and EX4 at a depth of 12 to 13 feet bgs in 2005. Locations of direct-push borings drilled in 2004 and remedial excavations completed in 2005 are shown in **Enclosure A, Figures 2 and 3**, respectively. Ground water samples were not collected in these borings at the time ground water was observed. Monitoring wells have not been installed at the Site to allow assessment of ground water elevations, water flow directions, gradients, and chemical quality throughout the Site.
- Ground water samples collected from temporary wells in direct-push borings B-4, B-7, and B-8 in 2015 (see **Enclosure A, Figure 4**) were all located west (likely cross-gradient) of identified former contamination sources, and thus are not sufficient to document the presence or absence of ground water quality impacts at the Site. The reported apparent absence of ground water in direct-push borings B-2 and B-3, drilled in 2015 south of the remedial excavations (see **Enclosure A, Figure 4**), does not support the conclusion in the October 2015 *Post-Cleanup Groundwater Confirmation Sampling Event* report that ground water is not present beneath the former contaminated soil areas of the Site.
- The full range of chemicals of potential concern (COPCs) associated with the identified contamination sources was not included in the soil sample analyses, as summarized in **Table 1 of Enclosure B** to this letter. Use of the tested analytes in soil (TPHg, TPHd, TPHo, and BTEX) as indicator hazardous substances to guide the completed excavation and removal of soil from the Site was acceptable; however, all COPCs must also be analyzed in ground water.
- Ecology recommends the following actions to address Site characterization data needs:
  - At a minimum, install ground water monitoring wells meeting resource protection well standards (WAC 173-160) in the vicinity of the following previously identified locations of soil contamination:
    - Excavation EX4 (see **Enclosure A, Figure 3**).
    - Former 1,000-gallon UST and borings DP-3, DP-6, and DP-11 (see **Enclosure A, Figures 2 and 3**).
    - Downgradient of the former painting, plumbing, and electric

maintenance shops and associated floor drains/dry wells, in the vicinity of boring DP-2 (see **Enclosure A, Figure 2**).

- Excavation EX2 and borings DP-9, DP-10, and DP-14 (see **Enclosure A, Figures 2 and 3**).
- These monitoring wells should be located in an anticipated downgradient ground water flow direction with respect to the documented areas of historical soil contamination at the Site. The well screens should be positioned such that anticipated seasonal ground water levels are within the screened interval of each well (i.e., well screens must not be totally submerged).
- Collect four quarterly sets of samples from the four monitoring wells using low-flow purge and sampling techniques.
- Prepare ground water level elevation contour maps for each quarterly monitoring event, illustrating ground water flow directions and providing data to calculate ground water gradients.
- Submit the first and second quarterly sets of ground water samples for analysis by an Ecology-certified laboratory for the following COPCs: TPH-Gx, TPH-Dx, BTEX, VOCs, carcinogenic PAHs (cPAHs), naphthalenes, arsenic (As), cadmium (Cd), chromium (Cr), nickel (Ni), lead (Pb), zinc (Zn), polychlorinated biphenyls (PCBs), and pesticides. Arsenic testing is required because the Site is located within the mapped area of soil impacts from the Tacoma ASARCO smelter airborne contamination plume. Pesticide testing is recommended given the historical use of these chemicals in the era when the large housing project operated on the Site from 1943 through 2005 and would have likely been used.
- Submit the third and fourth quarterly sets of ground water samples for analysis by an Ecology-certified laboratory for the following parameters: TPH-Gx, TPH-Dx, and BTEX. If any ground water samples from the first and second quarterly sampling events showed concentrations of VOCs, CPAHs, naphthalenes, metals (As, Cd, Cr, Ni, Pb, and Zn), PCBs, and pesticides greater than MTCA Method A ground water cleanup levels, include these analytes for testing of the third and fourth quarterly ground water samples.
- Note that use of silica gel cleanup is not acceptable for ground water samples analyzed for TPH-Dx. Specify laboratory reporting limits that are below the respective MTCA ground water cleanup levels.
- Incorporate the updated characterization of ground water conditions into a conceptual site model that fully addresses contamination sources, migration pathways, and potential receptors (see Section 6.3, Use of a Conceptual Site

Model, in *Guidance for Remediation of Petroleum Contaminated Sites, Toxics Cleanup Program Publication No. 10-09-057*, September 2011). Include quantitative documentation that the vapor intrusion exposure pathway was assessed (per the February 2016 draft Ecology guidance) and a Terrestrial Ecological Evaluation (TEE) per the requirements of WAC 173-340-7490 and associated Ecology guidance.

- Prepare an updated Site base map (line drawing; not aerial photograph base map) that includes the following data:
  - Locations of all historical potential contamination sources, including outlines of former maintenance center buildings.
  - Locations of all borings and monitoring wells.
  - Locations of hydrogeologic cross sections.
  - Outlines of the four remedial excavations.
- Prepare hydrogeologic cross sections that include the following data:
  - Descriptions of geologic strata and observed ground water levels from borings and monitoring wells.
  - Locations and depth profiles of potential contamination sources (including backfilled maintenance trench and previous maintenance center UST, underground hydraulic hoist, floor drain dry wells, and former 1,000-gallon UST and dispenser island.
  - Depth profile of backfilled CV4 construction stormwater pond.
  - Depth profiles of remedial excavations, including identification and depths of confirmation soil samples, and depths of ground water seepage observations.
  - Soil and ground water sample results with chemical concentrations above applicable MTCA Method A or B cleanup levels, including dates of sample collection.
  - Legend that includes MTCA Method A or B cleanup levels for chemical data shown on the section.
- Present the updated Site characterization data in a Remedial Investigation (RI) report format that consolidates all pertinent Site historical information, collected soil and ground water data, and completed soil cleanup data. See the following Ecology web page for a preferred RI report format and content requirements:

<http://www.ecy.wa.gov/programs/tcp/policies/checklists>

**2. Establishment of cleanup standards and selection of a cleanup action.**

- Ecology has determined the cleanup standards and cleanup action you selected for the Site do not meet the substantive requirements of MTCA. The Site characterization is not complete; therefore, establishment of cleanup standards is not complete, and Ecology considers the cleanup actions conducted at the Site (soil removal and off-Site disposal) as an interim cleanup action. The completed Site characterization (RI) should be the basis for preparation of a Feasibility Study (FS) that meets the MTCA requirements for selection of a cleanup action. See the following Ecology web page for a preferred FS report format and content requirements:  
<http://www.ecy.wa.gov/programs/tcp/policies/checklists> .

**3. Other Issues.**

- Electronic submittal of all sampling data into Ecology's electronic Environmental Information Management (EIM) database is a requirement in order to receive a final Ecology opinion for this Site. Jenna Durkee (email [jedu461@ecy.wa.gov](mailto:jedu461@ecy.wa.gov), or via telephone at 509-454-7865) is Ecology's contact and resource on entering data into EIM.
- Before further work is completed, Ecology encourages the development of a work plan to ensure that sufficient data for the soil and ground water is collected to avoid unnecessary expenditure of time and money.

**Limitations of the Opinion**

---

**1. Opinion does not settle liability with the state.**

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

**2. Opinion does not constitute a determination of substantial equivalence.**

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you

performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

**3. State is immune from liability.**

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

**Contact Information**

---

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: [www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm](http://www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm). If you have any questions about this opinion, please contact me by phone at 425-649-7257 or e-mail at [michael.warfel@ecy.wa.gov](mailto:michael.warfel@ecy.wa.gov).

Sincerely,



Michael R. Warfel, Site Manager  
NWRO Toxics Cleanup Program

MW:MC

Enclosures (2):   A – Description and Diagrams of the Site  
                          B – Table 1, Chemicals of Potential Concern at the Former Park Lake Homes  
                          Maintenance Shop Site

cc:     Dana Carlisle, GeoEngineers, Inc.  
       Sonia Fernandez, VCP Coordinator, Ecology

## **Enclosure A**

### **Description and Diagrams of the Site**



## Site Description

*This section provides Ecology's understanding and interpretation of Site conditions, and is the basis for the opinions expressed in the body of the letter.*

**Site:** The Site as characterized to date is defined by benzene, toluene, ethylbenzene, and xylenes (BTEX), total petroleum hydrocarbons (TPH) as gasoline (TPHg), TPH as diesel (TPHd), and TPH as oil (TPHo) releases to soil, and suspected releases of BTEX, TPHg, TPHd, and TPHo to ground water. The Site is located on King County tax parcel numbers 2895800960, 2895800180, and 2895800160 (the Property) and covers approximately 1.7 acres of these three parcels which total 1.97 acres in size. The Property street address of record is 9800 8<sup>th</sup> Avenue SE, Seattle, Washington; however, the Property also includes the following addresses on 8<sup>th</sup> Avenue SE: 9825, 9905, 9910, 9915, 9923, 9929, and 9934.

**Area and Property Description:** The Property is located in the White Center area of unincorporated King County, between West Seattle to the north and Burien to the south. The following streets bound the Property: 8th Avenue SW, SW 100<sup>th</sup> Street, 7<sup>th</sup> Avenue SW, and SW 97<sup>th</sup> Street (see **Figure 1**). The Property is presently occupied by six three-story residential apartment buildings and associated parking and open space (see **Figure 4**).

**Site History and Current Use:** The area in White Center that includes the Property was developed in 1943 as a temporary housing complex known as White Center Heights, and consisted of 569 units for workers building warplanes at the nearby Boeing plant in Seattle. The WWII-era units were removed by the King County Housing Authority (KCHA) in 1963 during construction of the Park Lake Homes affordable housing project that included 1,025 units on the 100-acre tract that included the Property. These housing units and associated maintenance buildings were demolished by KCHA in 2005 to construct the present housing development known as Greenbridge, which consists of 165 units in 71 residential buildings and includes the buildings and units on the Property.

**Sources of Contamination:** The 2003 Phase I Environmental Site Assessment (ESA) identified the following potential former sources of contamination at the Site:

- Multiple shops within the maintenance building, with floor drains and dry wells, for the following functions:
  - Sheet metal fabrication
  - Carpentry
  - Painting
  - Plumbing
  - Electrical

- A 1,000-gallon underground storage tank (UST) with a fuel dispenser stored gasoline for vehicles, lawn mowers, and other maintenance equipment, reportedly installed in 1984; removed in 1998.
- An older UST of unknown size and contents, reportedly removed by KCHA.
- Shallow, unlined trench over which vehicle oil changes were performed.
- A sub-slab hydraulic hoist with associated fluid cylinders and piping.
- Hazardous materials and oil drum storage.

**Physiographic Setting:** The Site is situated at an elevation of approximately 400 feet above mean sea level, on a regional upland ridge that slopes to the west towards Puget Sound and to the east towards the Duwamish River.

**Surface/Storm Water System:** Storm water on the Site is collected in catch basins, grassy swales (with and without underdrains), retention ponds, and rain gardens. The ground surface is relatively flat with a gentle slope to the southwest. The nearest surface water bodies are four small lakes located 1,000 to 1,500 feet southwest and south of the Site.

**Ecological Setting:** The Site is located in a developed area and is surrounded by residential land uses. The land surface of the Site and surrounding area is primarily covered with residential housing units and paving, with interspersed landscaping and open spaces. The White Center Pond Natural Area is located 1,000 feet west of the Site.

**Geology:** Borings drilled on the Site encountered fine to medium sandy silt and silty sand, with varying amounts of gravel and cobbles. Prior to development of the Property, a southward-sloping valley (interpreted as a former channelized erosional surface on top of the dense glacial till that caps the upland area) was reportedly present beneath the Property and was subsequently filled during construction of the original housing units in 1943. Locations of borings are shown on **Figures 2 and 4**.

**Ground Water:** Ground water was encountered in borings drilled at the Site at depths of 4 to 10 feet below ground surface (bgs), and ground water seepage was observed in remedial excavations at a depth of 12 to 13 feet bgs. This shallow ground water appears to be perched on top of the underlying dense glacial till. The likely ground water flow direction is to the south, based on the historic land topography (erosional surface on top of the glacial till); however, permanent monitoring wells have not been installed at the Site to allow measurement of ground water elevations and determination of ground flow directions and gradients.

**Release and Extent of Contamination:** A report of a release from the 1,000-gallon UST fuel system on the Property was received by Ecology on December 23, 1998. The removed UST (installed in 1984) was observed to be in good condition and the documented soil contamination was attributed to fuel spills and overfills around the UST fill pipe.

A subsurface investigation was conducted at the Site in 2004 prior to redevelopment of the Property and included 15 direct-push borings (see **Figure 2**). Soil samples from four borings showed concentrations of gasoline-, diesel-, and lube oil-range hydrocarbons (TPHg, TPHd, and TPHo, respectively) above MTCA Method A soil cleanup levels for unrestricted land use. Ground water was encountered between depths of 4 and 10 feet bgs during drilling; however, ground water samples were not collected.

Seven direct-push borings were drilled at the Site in 2015 (see **Figure 4**). Ground water samples were collected from temporary monitoring wells in three of these borings. None of the tested chemical parameters (TPHg, TPHd, TPHo, and volatile organic chemicals) were present in concentrations above MTCA ground water cleanup levels. However, based on the likely southerly shallow ground water flow direction, these temporary monitoring wells appear to be located cross-gradient of former potential contamination sources at the Site.

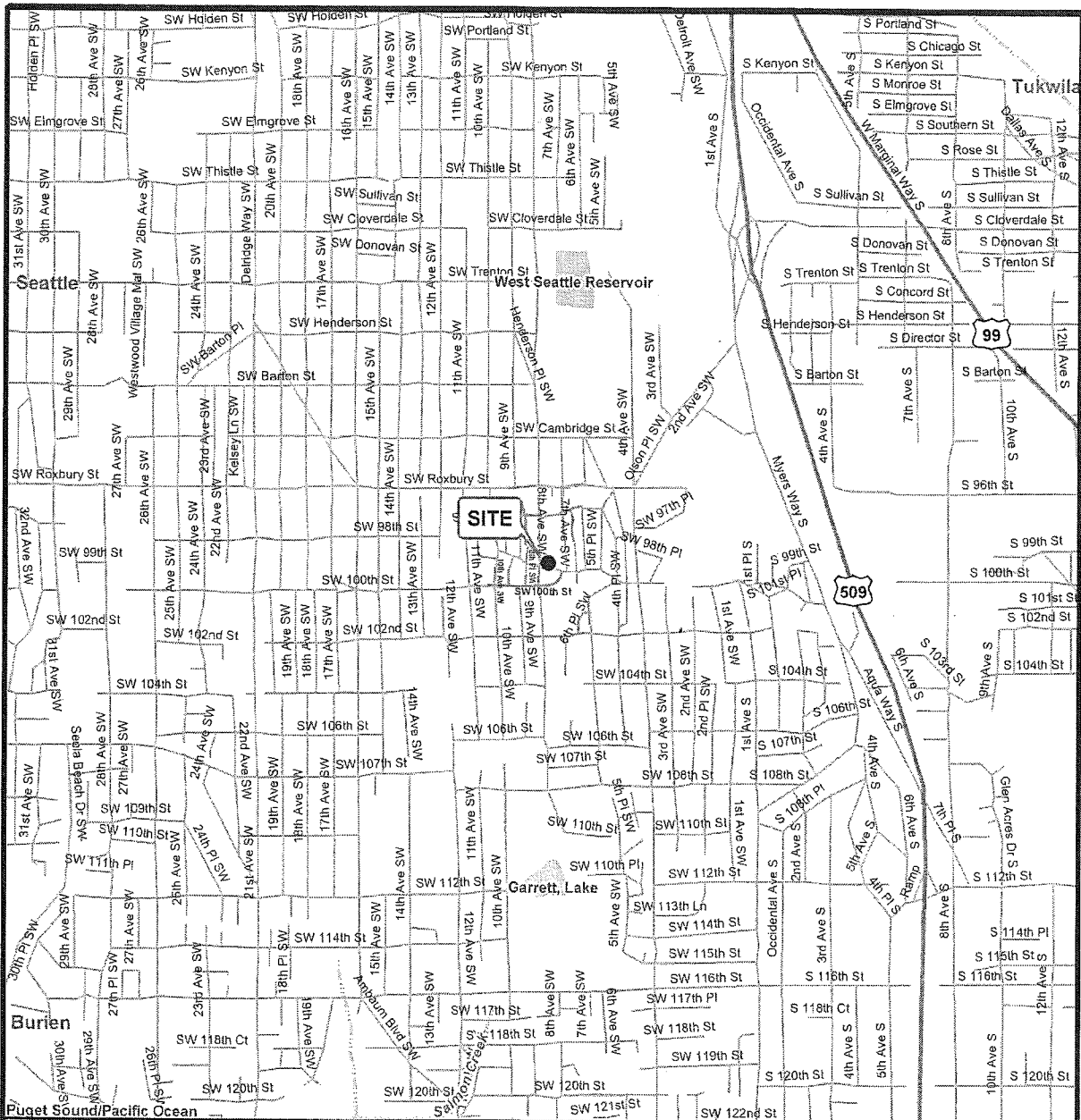
**Interim Cleanup Actions:** Four excavations ranging in depth from 4.5 to 18 feet bgs were completed at the Site in 2005 (see **Figure 3**). Confirmation soil samples were tested for BTEX, TPHg, TPHd, and TPHo and showed concentrations below Method A soil cleanup levels for unrestricted land use. A total of 2,296 tons (approximately 1,200 cubic yards) of petroleum-contaminated soil was removed for off-Site disposal. Moderate ground water seepage was observed in two of the four excavations at depths of 12 to 13 feet bgs.

## Site Diagrams

Map Revised: August 25, 2005

Path: P:\111329003\104\PDFs\11329003-04-T921\_Fig1\_VM.pdf

Office: REDM



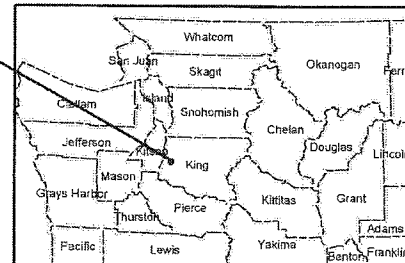
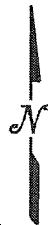
**KCHA MAINTENANCE FACILITY  
FORMER PARK LAKE HOMES  
9900 8TH AVENUE SOUTHWEST  
SEATTLE, WASHINGTON**

All locations are approximate.

Lambert Conformal Conic  
Washington State Plane North  
North American Datum 1983

Data Sources: Interstates, state routes, and roads from TIGER 2000.  
County boundaries, cities, and waterbodies from Department of Ecology.

0 1,000 Feet

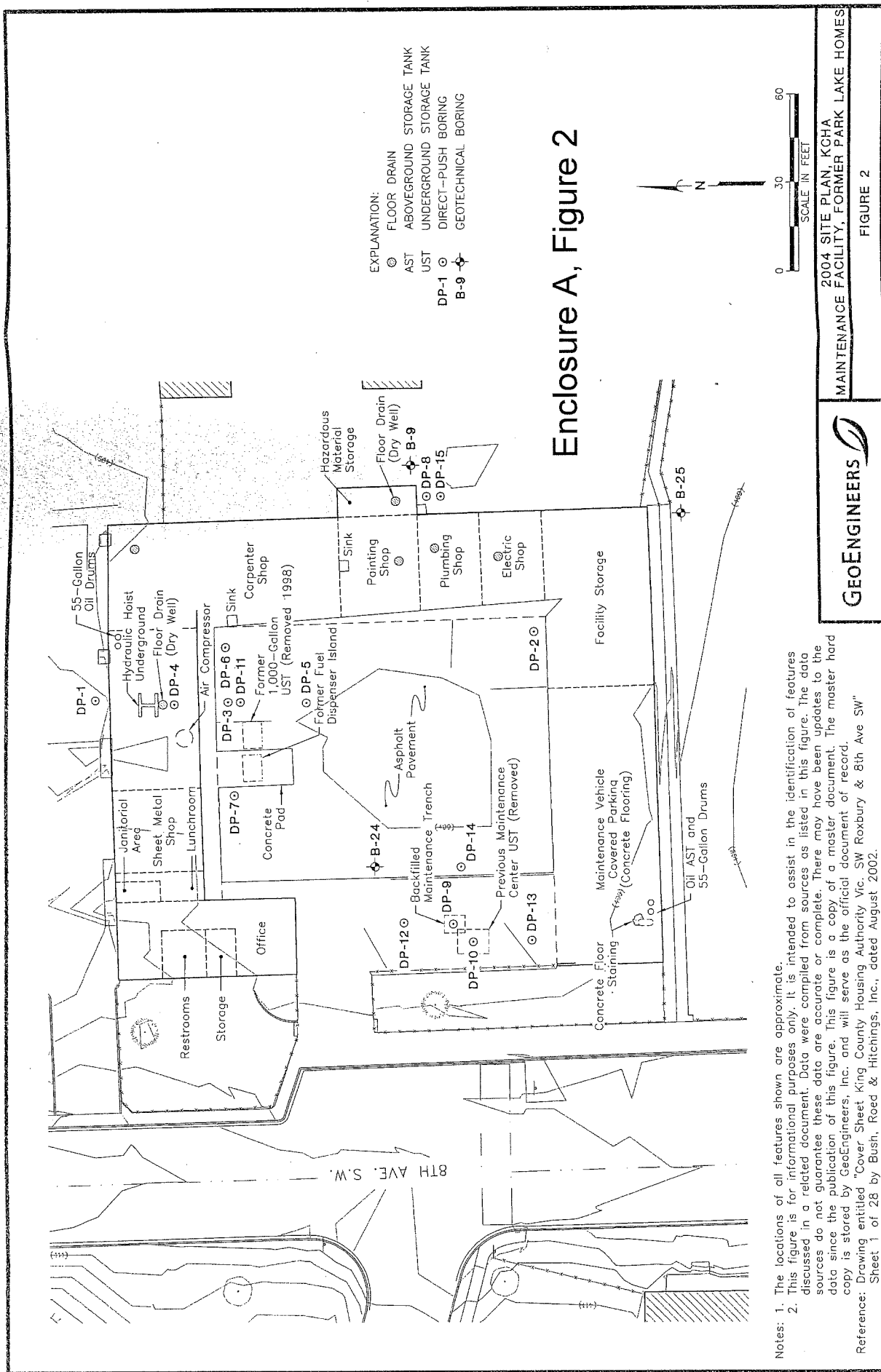


**GEOENGINEERS**

**VICINITY MAP**

**FIGURE 1**

Enclosure A, Figure 1




Enclosure A, Figure 3

Reference: Drawing entitled "Cover Sheet King County Housing Authority Vic. SW Roxbury & 8th Ave SW Sheet 1 of 28 by Bush, Roed & Hitchings, Inc., dated August 2002.

EXPLANATION:

EX1

EX1-5-2.5  SOIL SAMPLE

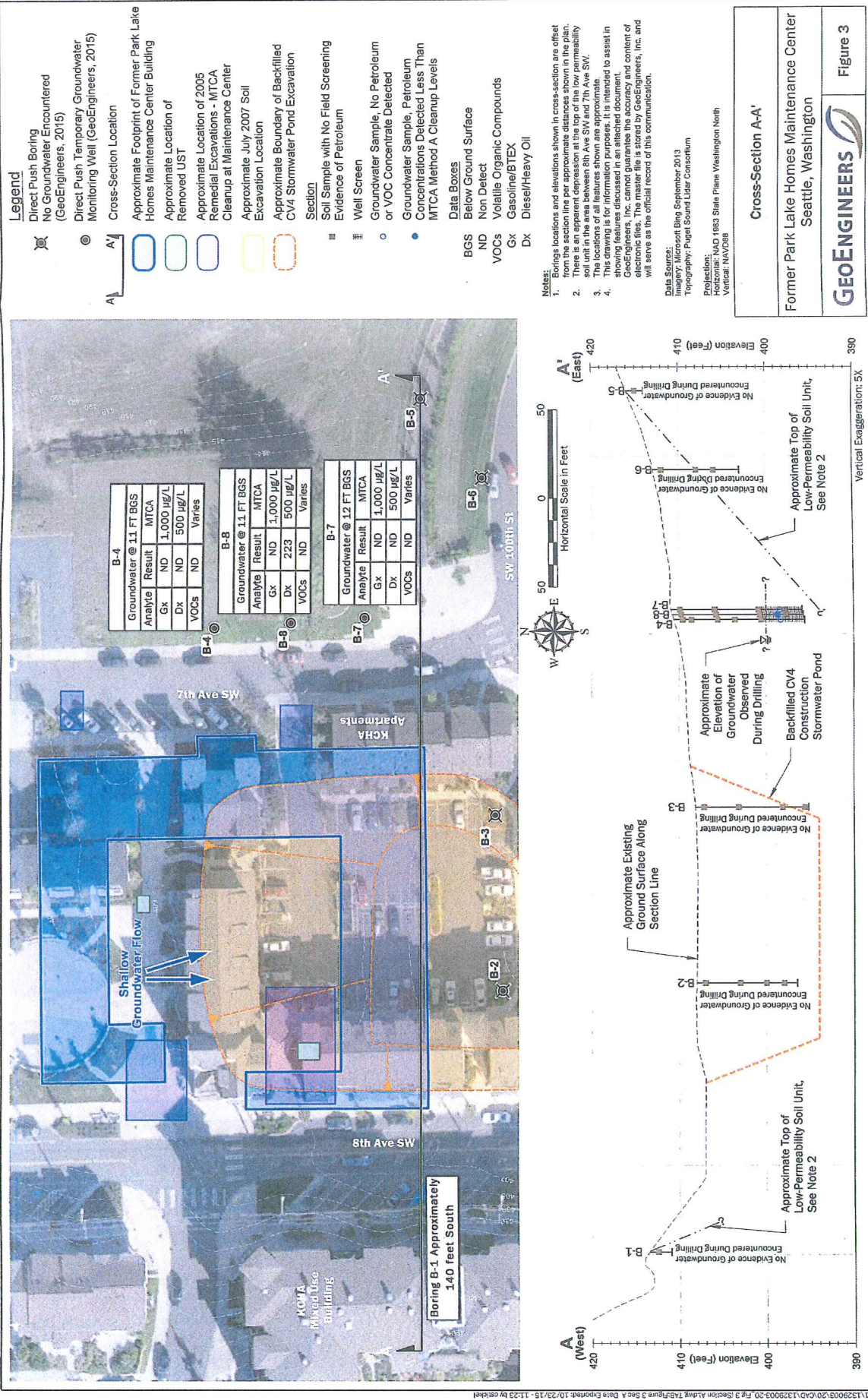
0 30 60  
SCALE IN FEET

FIGURE 3

EXCAVATION AND SAMPLE LOCATIONS, KCHA  
MAINTENANCE FACILITY, FORMER PARK LAKE HOMES

**GEOENGINEERS**





Enclosure A, Figure 4



## **Enclosure B**

### **Table 1, Chemicals of Potential Concern at the Former Park Lake Homes Maintenance Shop Site**

**Table 1. Contaminants of Potential Concern at the Former Park Lake Homes Maintenance Shop Site**

Contaminant Source and Associated Test Borings	Contaminants of Potential Concern (shaded) / Tested in Soil (X)															
	HCID	TPHg	TPHd	TPHo	Mineral Oil	BTEX	Pb	Cd	Cr	Ni	Zn	HVOC	PCB	CPAH	Naphthalenes	Pesticides
Hydraulic Hoist and Dry Well																
DP-1	X		X	X												
DP-4																
DP-3			X	X		X										
DP-11			X	X												
Gasoline UST																
DP-5	X															
DP-6																
DP-7																
Maintenance Center UST and Trench																
DP-9		X	X	X		X										
DP-10		X	X	X		X										
DP-12	X	X	X	X												
DP-13	X	X	X	X												
DP-14	X	X	X	X												
EX-2 samples		X	X	X		X										
Haz Mat Storage and Dry Wells																
DP-2																
DP-8	X		X	X												
DP-15	X		X	X												
EX-1 samples			X	X												
Excavation Area 3 (unknown source)																
EX-3 samples	X	X	X	X	X	X						X			X	
Excavation Area 4 (unknown source)																
EX-4 samples	X	X	X	X		X						X			X	