Groundwater Investigation Work Plan

Bridgeport Shopping Center – Royal Shine Cleaners
VCP Identification: SW1262

316 SE 123rd Avenue
Vancouver, Washington

EBI Project No. 12120279

July 25, 2013

Prepared for:

Norris & Stevens
621 SW Morrison Street, Suite 800
Portland, OR 97205

Prepared by:

EBI Consulting
environmental | engineering | due diligence

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July 25, 2013

Mr. Hans Qiu
Site Manager
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

Subject: Groundwater Investigation Work Plan
Bridgeport Shopping Center – Royal Shine Cleaners
VCP Identification: SW1262
316 SE 123rd Avenue, Vancouver, Washington
EBI Project No. 12120279

Dear Mr. Qiu,

EBI on behalf of Norris Stevens is providing a copy of the Groundwater Investigation Work Plan for the above referenced property (herein referred to as the Subject Property). The work plan was prepared as part of continued site characterization activities performed in accordance with the Voluntary Cleanup Program by the State of Washington Department of Ecology letter dated November 20, 2012. A copy of the acceptance letter is included in Appendix B.

Please contact me after reviewing the report so we can discuss the requirements for obtaining case closure for the impacts identified.

Please contact me if you have any questions or if I may be of further assistance.

Respectfully submitted,
EBI CONSULTING

Joseph Krohn, P.G.
Program Manager

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1.0 INTRODUCTION

EBI Consulting (EBI) is pleased to submit this *Groundwater Investigation Work Plan* for the Royal Shine Cleaners located in the Bridgeport Shopping Center at 316 SE 123rd Avenue in Vancouver, Washington (see Figures in Appendix A). The work plan was prepared as a follow up to EBI's *Additional Site Characterization Report* dated March 13, 2013. The additional site characterization is being conducted in accordance with a Voluntary Cleanup Program agreement with the State of Washington Department of Ecology (Ecology). A copy of the November 20, 2012 acceptance letter is included in Appendix B.

1.1 SITE LOCATION AND DESCRIPTION

The Subject Property is located at the southwest corner of the intersection of SE Mill Plain Boulevard and SE 124th Avenue (Figure 3). The property is an irregular-shaped parcel, totaling approximately 4.85 acres. The site was reportedly constructed in 1990 and consists of a multi-tenant, mixed-use, office and retail facility. The shopping center includes five, one-story buildings (Buildings A through E), with a total net rentable area of approximately 52,355-square feet. The layout of the shopping center is depicted on Figure 3.

A dry cleaning facility has reportedly operated at tenant space D2 since at least 2001 (Figure 4). The Royal Shine Cleaners has operated at the site since 2008. This facility currently operates one "fourth generation" self-enclosed (dry-to-dry) dry cleaning unit that cycles perchloroethylene (PCE) as a cleaning solvent. This unit was reportedly installed in June of 2010. Waste sponges and residue generated by the dry cleaning process are placed in one 55-gallon steel drum, located behind the dry cleaning machine. Secondary containment (spill pan) was observed beneath the dry cleaning machine, and beneath the 55-gallon waste drum. The concrete floor in the vicinity of the dry cleaning machine and waste storage area is coated with an epoxy sealant. The concrete slab floor and epoxy sealant appeared to be intact, with no apparent areas of deterioration, cracking, or delamination of the epoxy sealant.

1.2 PREVIOUS INVESTIGATIONS

In May 2012 and February 2013, EBI advanced 12 borings (B-1 through B-12) in the vicinity of the dry cleaner to assess whether the dry cleaning solvent PCE had impacted soil or soil vapor below the site. The locations of the previous soil borings are depicted on Figure 4. EBI identified impacted soils with concentrations of PCE above Ecology MTCA Method A soil cleanup standards and impacted sub-slab soil vapor with concentrations of PCE and Trichloroethene (TCE) above Ecology Method B Soil Gas Screening Levels. Based on the results presented in EBI's March 13, 2013 report, Ecology has directed additional work including assessing whether the PCE detected in soil and soil vapor have impacted groundwater below the site.

Little information is known about the depth to groundwater below the site. Based on review of Ecology databases and well logs, and interviews with local drilling subcontractors, groundwater is expected to occur at depths ranging from 30 to 60 feet below ground surface. The direction of groundwater flow is expected to be to the south, toward the Columbia River.

2.0 PURPOSE AND SCOPE OF WORK

The purpose of the proposed investigation is to assess the depth and direction of groundwater flow below the site and evaluate whether the PCE reported in soil and soil vapor have impacted groundwater. The investigation will include the installation of a deep pilot boring to evaluate subsurface lithologic conditions, and the installation and testing of three groundwater monitoring wells.

A secondary purpose of the investigation will be to provide lithologic data and drilling conditions for further delineating the vertical extent of PCE in soil vapor below the site. Based on data collected from this proposed groundwater investigation, a scope of work will be developed at a later date to further delineate the lateral and vertical extent of PCE impacted soil vapor in the vicinity of the dry cleaner. .

A detailed description of investigation methods is provided in Section 4.0 of this report.

3.0 SUBJECT PROPERTY DESCRIPTION/PHYSICAL SETTING

3.1 SUBJECT PROPERTY DESCRIPTION

The Bridgeport Shopping Center is located at 316 SE 123rd Avenue in Vancouver, Clark County, Washington. The shopping center is located at the southwest corner of the intersection of SE Mill Plain Boulevard and SE 124th Avenue (Figure 3). The property includes one irregular-shaped parcel, totaling approximately 4.85 acres and consists of a multi-tenant, mixed-use, office and retail facility that was reportedly constructed in 1990. The property includes five, one-story buildings, with a total net rentable area of approximately 52,355-square feet. Building B contains a partial basement under the Express Lube tenant space. The dry cleaner is located in tenant space D2.

According to the Clark County Assessor's Office, the Subject Property is currently owned by Gardner Bridgeport Associates Limited Partnership.

At the time of inspection, the Subject Property was occupied by a retail strip plaza, including five, one-story buildings. There were 23 in-line commercial retail tenant spaces in three buildings, one automotive repair facility in a single building, and a quick lube and carwash in the fifth building. Ten vacant tenant spaces were identified at the time of inspection. An on-site dry cleaning facility (Royal Shine Cleaners) occupies Unit D2.

3.2 PHYSICAL SETTING

3.2.1 Regional Geology/Bedrock

No bedrock outcroppings were observed at the Subject Property. Information concerning the geology of the Subject Property was obtained from the USGS Map of the Physical Divisions of the United States (1946). The Subject Property is located within the Puget Trough section of the Pacific Border physiographic province, which consists of partially submerged lowlands with diverse character.

3.2.2 Soils

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) website (http://websoilsurvey.nrcs.usda.gov/app/), the dominant soil composition in the vicinity of the Subject Property is classified as Lauren gravelly loam, 0 to 8 percent slopes (LgB). This soil consists of deep, well-drained soils formed in old alluvium and loess containing volcanic ash on terraces and terrace escarpments. The soil extends to a depth of 52 inches. Lauren soils are slightly acid to neutral. Permeability is moderate in the upper part of the solum and rapid in the underlying material.

Soil stratigraphy encountered during the completion of soil borings consisted of approximately four to six feet of light brown, sandy loam with gravel, underlain by approximately two to four feet of coarse-grained gravel containing poorly sorted sand interbedded with sandy loam, underlain by a layer of poorly-sorted, angular sand with gravel to 20 feet, the maximum depth explored. Refusal was encountered at this depth with the direct push drilling equipment.

3.2.3 Hydrogeology

Local groundwater gradient is expected to follow surface topography; therefore, groundwater flow near the Subject Property is expected to flow to the south. Based on review of Ecology databases and well logs, and interviews with local drilling subcontractors, groundwater is expected to occur at depths ranging from 30 to 60 feet below ground surface. The direction of groundwater flow is expected to be to the south, toward the Columbia River.

4.0 FIELD ACTIVITIES

The purpose of the proposed site investigation is to assess the soil lithology and determine the depth and direction of groundwater below the site. The proposed investigation includes the installation of three groundwater monitoring wells. The locations of the proposed wells are shown on Figure 5. A description of the proposed sampling and testing work is presented in the following sections.

4.1 SCOPE OF WORK

The following tasks will be performed as part of the site investigation work at the site:

1. Preparing this work plan for submittal to Ecology for the installation of three groundwater monitoring wells.
2. Submitting a notice of intent to Ecology for the proposed groundwater monitoring wells.
3. Performing a limited underground utility survey.
4. Drilling a pilot boring to 60 feet or first groundwater to identify lithologic data and drilling conditions.
5. Constructing three 2-inch diameter groundwater monitoring wells.
6. Surveying the top of casing elevation and latitude/longitude of each well.
7. Developing and sampling the three newly installed wells.
8. Performing one round of groundwater monitoring including the collection of water levels and groundwater samples from each well.
9. Analyzing soil and groundwater samples for volatile organic compounds (VOCs) including the dry cleaning solvent PCE and its breakdown components.
10. Preparing a report summarizing the findings of the investigation.

4.2 PERMITS AND PRELIMINARY WORK

A notice of intent for the new monitoring wells will be filed with Ecology prior to drilling. The State of Washington Utility Notification Center will be contacted to locate any utilities in the vicinity of the planned well locations. As an additional precaution against encountering any buried utilities, a private utility locating service will be hired to survey the proposed boring locations using a magnetometer to identify underground utilities.

4.3 WELL INSTALLATION

Three groundwater monitoring wells will be installed at the site at the locations shown on Figure 5. A pilot boring, located between Buildings C and D, will be drilled first to evaluate the lithology below the site and to establish the depth to groundwater below the site. Based on the lithology and depth to water obtained from the pilot boring, the three proposed groundwater monitoring wells will be designed and installed. As the soils below the site are expected to include heavy gravels and cobbles, the borings will be advanced using sonic drilling techniques.

A description of the drilling and well construction work is presented in the following sections.

4.3.1 Drilling Methodology

The borings and well construction work will be performed using sonic drilling techniques, which has the capability of penetrating through cobbles, as refusal was encountered at 20 feet bgs in previous borings using the direct push method.

The boreholes will be continuously cored with the sonic drilling method. When undisturbed discrete soil samples are needed, a Standard Penetration Testing (SPT) sampler will be used to collect undisturbed drive samples.

Sonic drilling is a soil penetration technique that fluidizes porous materials. Using a sonic head, drill casing and rods are brought to a vibration frequency of 100-200 Hz, which is within the range of human hearing. These waves are transmitted through the drill string to the end of the casing and reflected, causing the casing to stretch and thin, and to shorten and thicken 100-200 times per second. This intense vibration causes a very thin layer of soil directly around the drill rods to fluidize. The fluidized soil zone extends a maximum of 5 millimeters from the rod. The soil in the influenced area behaves like a fluid, which dramatically reduces the friction between the drill rod and the surrounding soil, allowing very rapid penetration. The same friction reduction applies to the inner surface of the soil sampling tool, and enables collection of very long sample cores. In addition to the vertical vibration, compact sonic drill heads can rotate to easily make up and break drill rods, and to cut concrete or asphalt. Sonic drill heads vibrate and rotate simultaneously, providing cutting at the bit face in addition to the sonic vibration, to penetrate competent material.

The sonic drill head contains two or more synchronized eccentric weights that are driven by high-speed hydraulic motors, (6-12,000 rpm). The drill head is mounted in oversized isolation blocks to concentrate energy on the drill string. The movement of the eccentric weights brings the casing into a purely vertical vibration. With low pull-down or pull-up force, the casing can be driven and retrieved.

4.3.2 Soil Boring Logging and Sampling

All of the borings will be logged in accordance with USCS. Soil boring logs and well construction details will be recorded on field soil boring logs. Continuous coring will be performed with the sonic drilling method. In addition, discrete undisturbed soil samples will be collected as needed using a 1.4-inch diameter steel split spoon sampler (SPT) lined with three clean six inch long stainless steel tubes. The sampler will be driven into the underlying soil using a 140 pound hammer with a 30 inch drop.

For undisturbed samples, the SPT sampler will be driven into the soil and retrieved from the borehole. Upon retrieval, the tubes will be inspected and the soils will be logged. In general, the bottom tube of each sample interval will be used for submittal to the analytical laboratory, if scheduled for testing. The middle tube and/or bottom tubes will be used to perform the soil logging and field screening with the PID.

4.3.3 Field Screening

To provide a preliminary indication of petroleum hydrocarbons in the borings, a portable photo-ionization detector (PID) will be used to monitor for the presence of organic vapors in drill cuttings and drive samples. The PID measures relative concentrations of VOCs and is calibrated to an isobutylene standard.

The field screening will consist of filling a sealable plastic bag to about one-third capacity with soil and sealing the container. After allowing sufficient time for the soil vapor to equilibrate with the container's headspace, the bag will be slightly opened or pierced to allow for insertion of the PID probe.

The concentrations of organic vapors detected by the PID will be recorded on the field boring logs. Field screening will also include documenting other indications for the presence of impacts, such as staining, odors, discoloration, and/or chemical sheens.

4.3.4 Well Construction

Following the coring and soil sampling, the borings will be converted to groundwater monitoring wells. The depth and screened interval of the new wells will be based on the lithologic conditions encountered during the continuous coring and sampling.

In general, the wells will be constructed with 15 linear feet of well screen, with the top of screen intercepting the water table surface. All wells will be constructed of Schedule 40 polyvinyl chloride (PVC) well screen with factory milled perforations. The annular space of each borehole will be filled with sand to approximately six inches above the top of screened interval. The wells will be constructed with 0.020" perforated well screen and #3 sand. A 2-foot thick bentonite seal will be emplaced above the filter pack and the remaining annulus filled with a neat cement grout to within 12-inches of surface grade. The top of the wellhead assembly will be enclosed at the surface in a flush-mounted well box set in concrete. The boxes will be installed at a height slightly above existing grade to promote runoff away from the well head. Typical construction details for the groundwater monitoring wells are included as Figures 6.

All well construction work will be performed in accordance with Washington Administrative Code (WAC) Chapter 173-160 Minimum Standards for Construction and Maintenance of Wells.

4.4 WELL DEVELOPMENT

Well development will be performed to remove high turbidity water from the well casing and surrounding borehole, and to develop the sand pack and nearby aquifer materials to promote the flow of non-turbid formation water toward the well. The wells will be developed using a combination of bailing, surge block, and pumping.

Indicator parameters including pH, electrical conductivity, temperature, and turbidity will be monitored to check the effectiveness of development. Approximately three to five well casing volumes of water will be removed as part of the development, depending on the effectiveness of the development.

4.5 WELL SURVEYING

Following installation of the groundwater monitoring wells, the top-of-casing elevations will be surveyed to the nearest 0.01 vertical foot by a licensed land surveyor. The elevations will be into vertical datum NAVD 88 in relationship to mean sea level. Latitude and longitude locations of the groundwater monitoring wells will also be established using horizontal control data.

4.6 GROUNDWATER MONITORING

After well development is complete, depth to water measurements will be collected and groundwater samples will be collected for analytical testing. The total depth and depth to groundwater will be measured in each well and recorded on field groundwater sampling forms.

Prior to sampling, the wells will be purged using either a submersible pump or disposable bailer. Groundwater samples will be collected after the water levels in the wells had recovered to the static level, or in the event that the well is pumped dry during purging, when the water level recovered to at least 80% of the original water level. Water samples will be collected using a new disposable bailer, decanted from the bailer into laboratory provided containers appropriate for the analytical method requested. The samples will be labeled, stored, and transported in an iced cooler under chain-of-custody documentation to a State-certified testing laboratory for analysis on a standard turn-around time.

4.7 INVESTIGATIVE DERIVED WASTE

Drill cuttings, rinsate water, and purge water will be placed in properly labeled 55-gallon drums for temporary on-site storage, pending waste profiling and proper disposition.

5.0 PROJECT SCHEDULE AND REPORTING

Following completion of the field activities, a report will be completed that will include:

- figures depicting sampling locations;
- lithologic logs of soil borings;
- well construction diagrams;
- tables summarizing analytical data;
- groundwater elevation contour map;
- figures displaying analytical results;
- cross sections depicting subsurface conditions;
- comparison of analytical data to appropriate screening levels; and
- recommendations for additional work, if warranted.

The anticipated schedule is as follows:

- July 26, 2013 - Submit work plan to Ecology
- August 9, 2013 - Approval of work plan from Ecology
- September 15, 2013 - Completion of well installation work
- October 15, 2013 - Submit report to Ecology.

6.0 REPORT DISTRIBUTION

A copy of this work plan will be submitted in final form to:

Mr. Hans Qiu
Site Manager
Department of Ecology
PO Box 47775
Olympia, WA 98504-7775

APPENDIX A
FIGURES

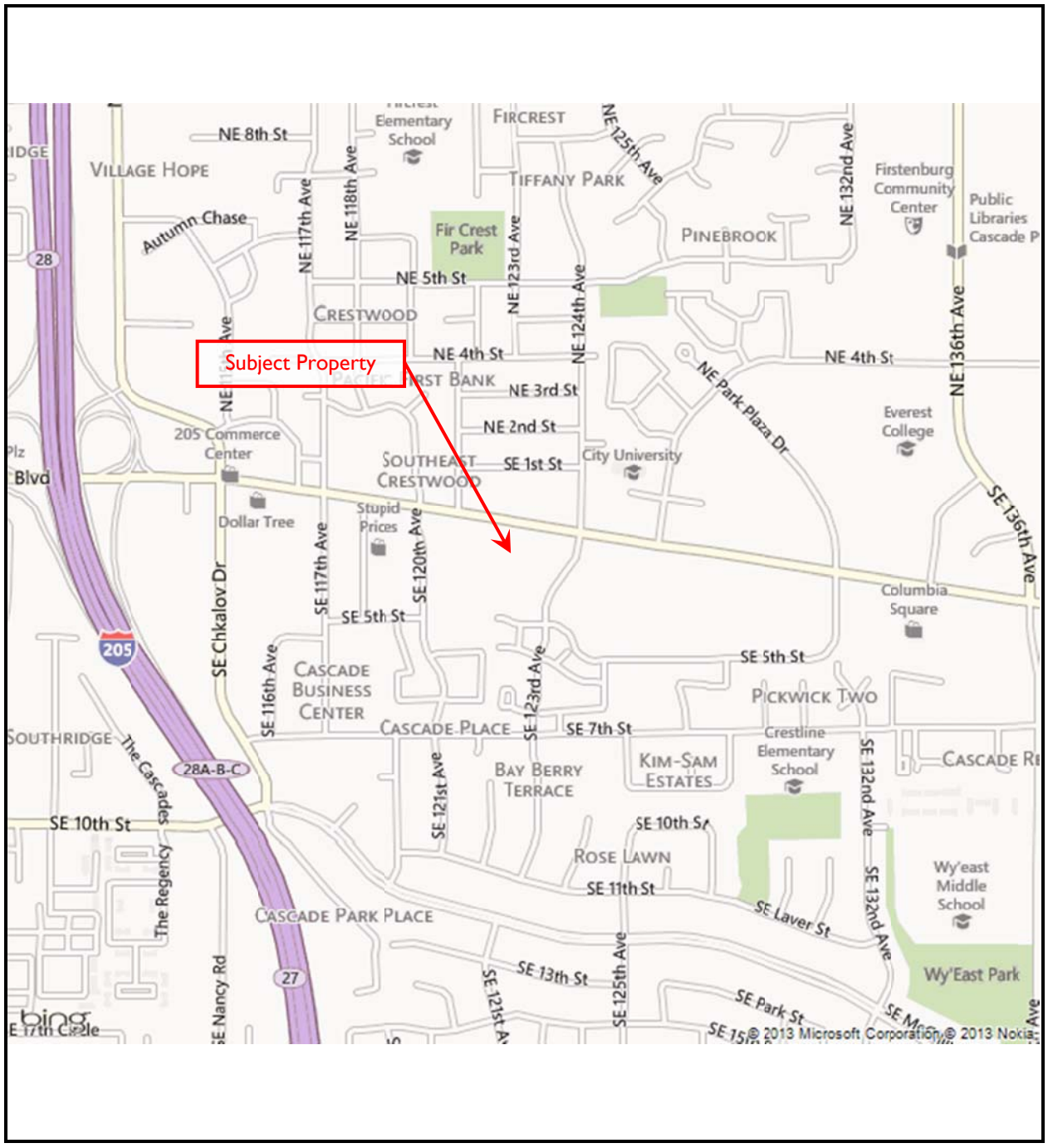

Figure 1
Site Location Map

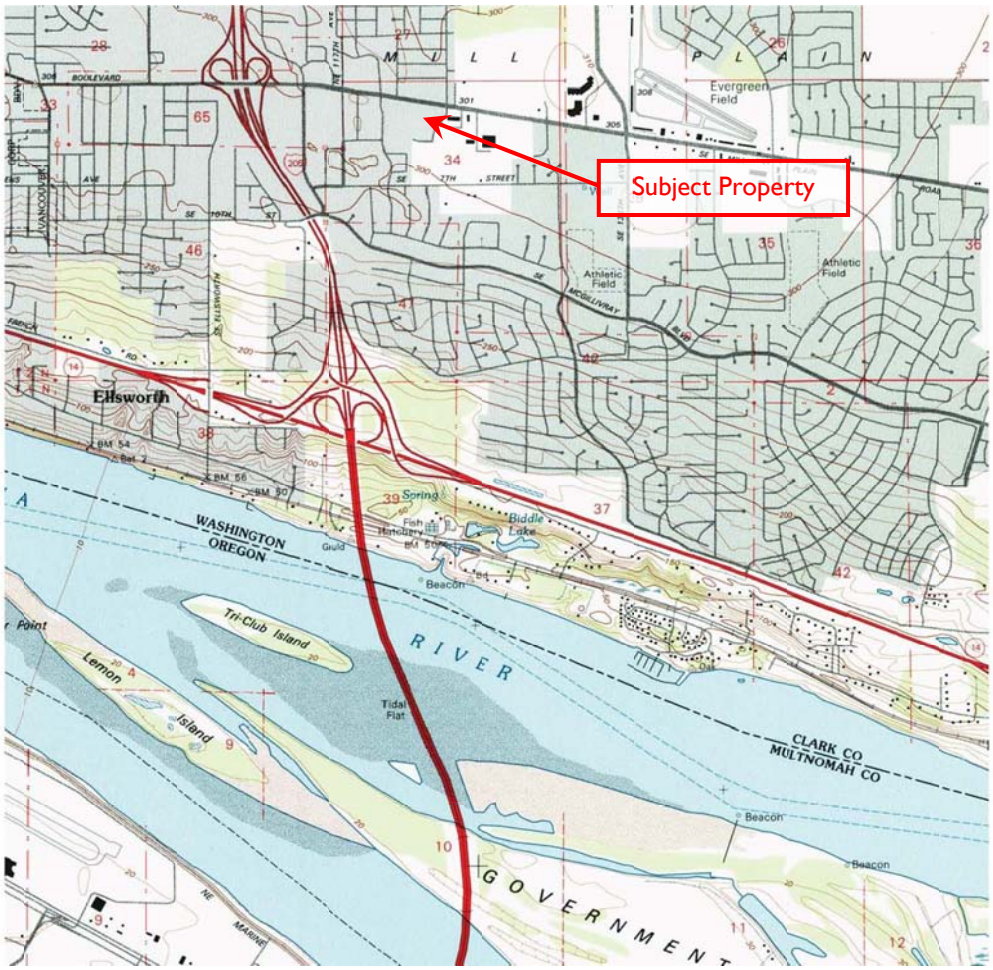

Figure 2
Site Topographic Map

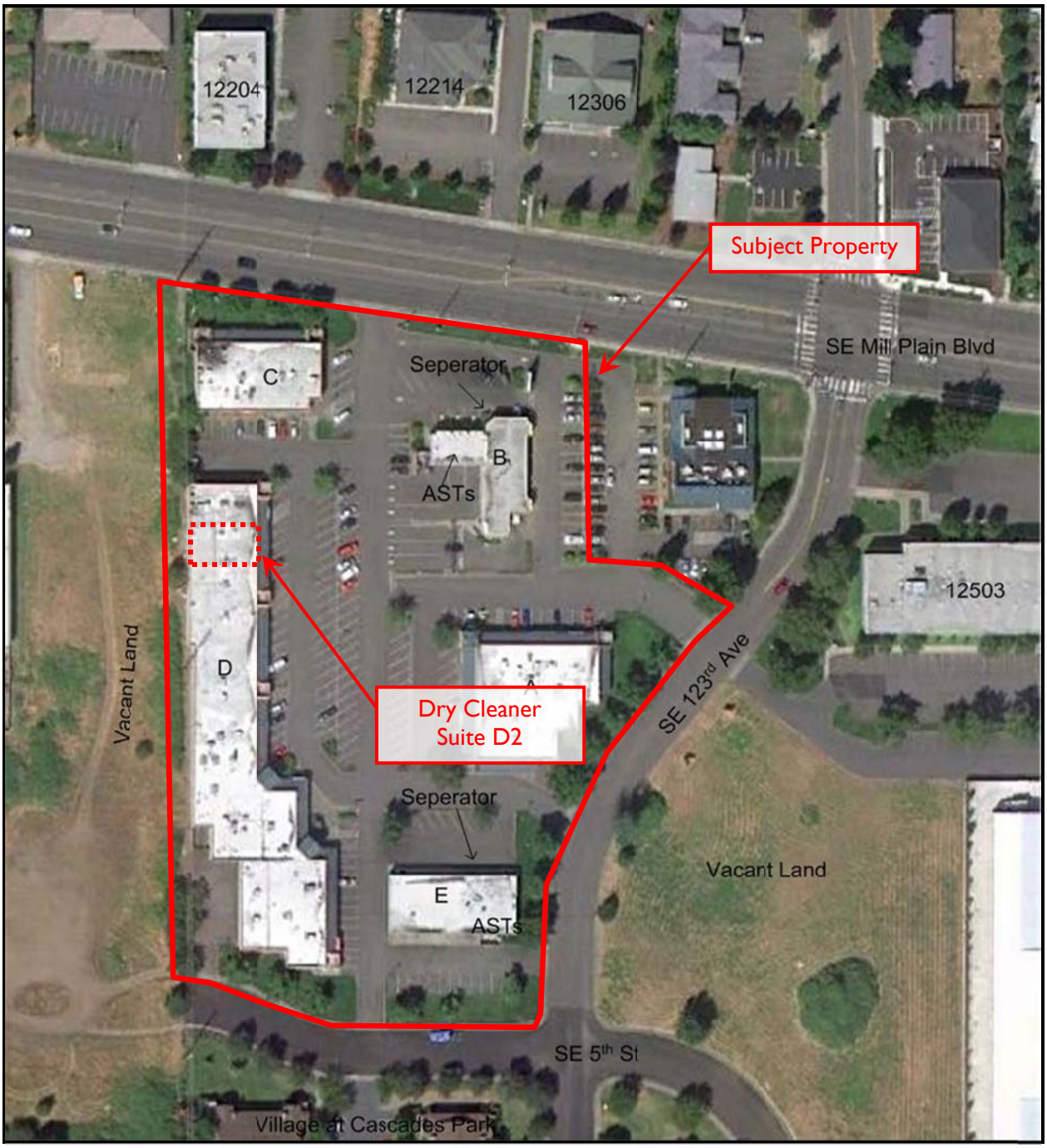

Figure 3
Site Layout Map

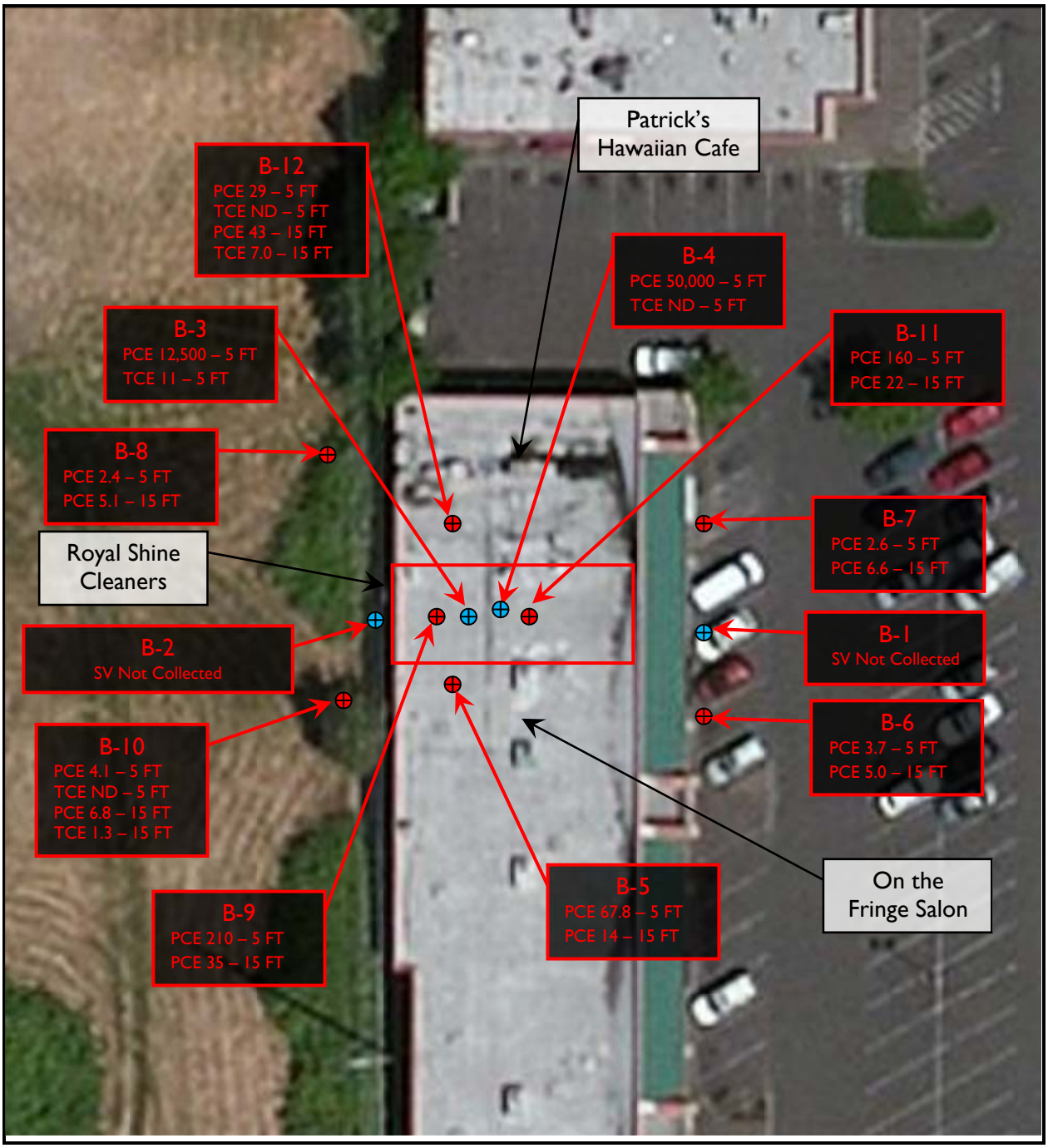

Figure 4

Boring Location Map

⊕ Borings B-1 through B-4 on May 15, 2012
⊕ Borings B-5 through B-12 on February 26-27, 2013

KEY
Sample ID
PCE Concentration in Soil Vapor in ug/m3 – Depth
TCE Concentration in Soil Vapor in ug/m3 – Depth

EXAMPLE
B-6
PCE 4,500 – 5 FT
TCE 5,500 – 15 FT

FIGURE 5

PROPOSED WELL LOCATION MAP

⊕ PROPOSED GROUNDWATER MONITORING WELL

Not to scale

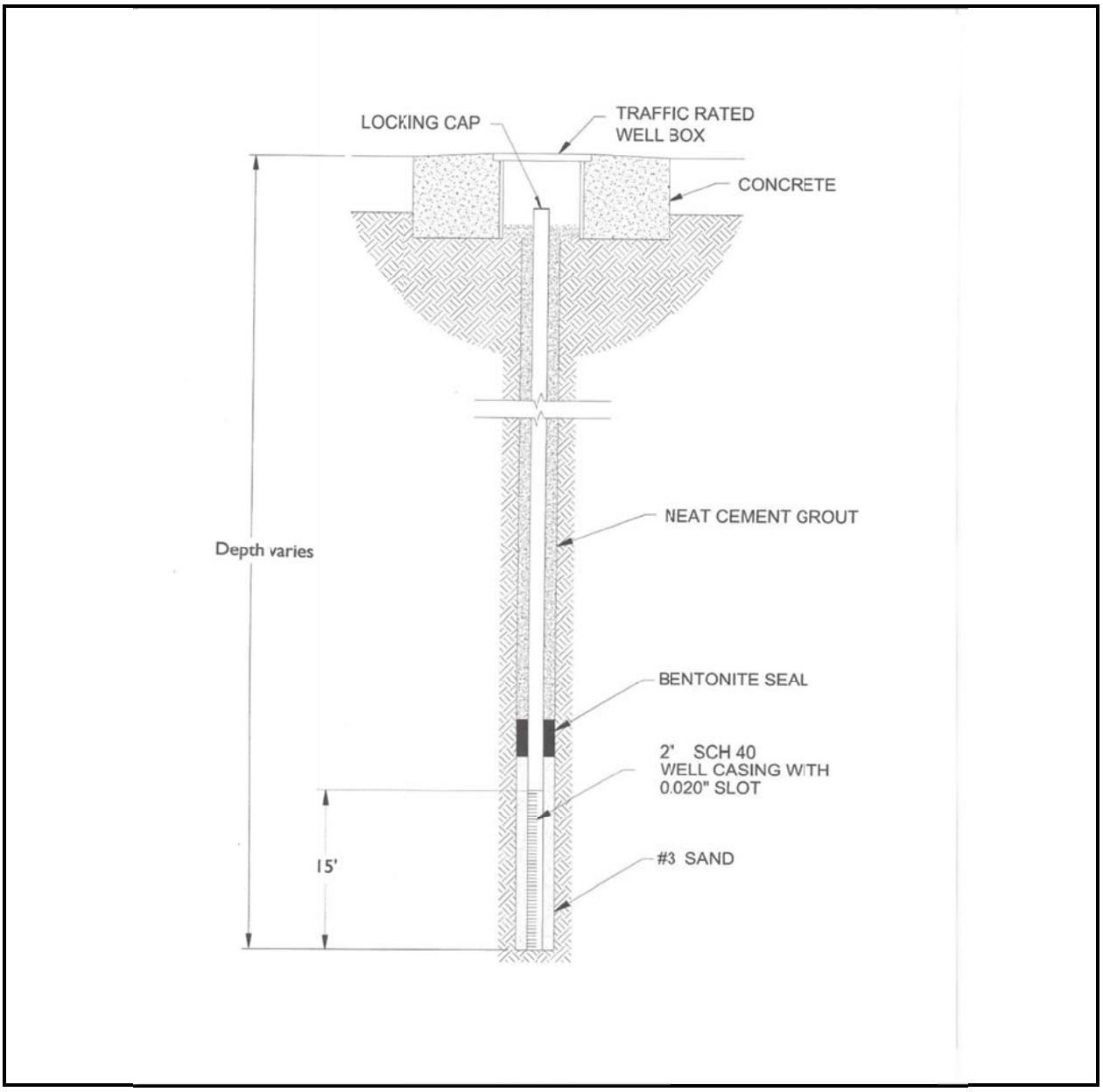

FIGURE 6

MONITORING WELL DETAIL

Not to scale

APPENDIX B
WASHINGTON DOE VOLUNTARY CLEANUP PROGRAM

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300

November 20, 2012

Mr. David E. Hamilton
Norris & Stevens Receiver for Bridgeport Retail Center
621 SW Morrison Suite 800
Portland OR 97205

Dear Mr. Hamilton:

Your complete application for the Voluntary Cleanup Program (VCP) was accepted on November 19, 2012. The purpose of this letter is to acknowledge receipt of your application and to provide you with the name of the Site manager assigned to your cleanup site.

Site Name:	Royal Shine Cleaners
Site Manager:	Hans Qiu
VCP Identification:	SW1262

Our database has been updated to reflect your participation in the Voluntary Cleanup Program. I have enclosed a signed copy of the VCP agreement for this project for your records. If you have any questions, your Site Manager can be reached at 360-407-6265.

I need to advise you of our new Data Submittal Requirements defined in Policy 840 (enclosed). This policy mandates that all Environmental Monitoring Data generated during Contaminate Site Investigation and Cleanup activities shall be required to be submitted to Ecology in both written and electronic format. Policy Item #3 (attached) applies to the Voluntary Cleanup Program and reads: *"All reports on Independent Remedial Actions submitted after October 1, 2005, under Ecology's VCP program shall not be reviewed until the data have been submitted in compliance with this policy."* Questions regarding this policy and how it affects your Voluntary Cleanup Program project can be discussed with your site manager.

Thank you for your commitment to the environment and the Voluntary Cleanup Program.

Sincerely,

Scott Rose, L.G.
Acting VCP Unit Manager
Southwest Regional Office
Toxics Cleanup Program

SR/ksc:acceptance letter SW1262

Enclosures

cc: Richard George, EBI
Hans Qiu, Ecology
Dolores Mitchell, Ecology