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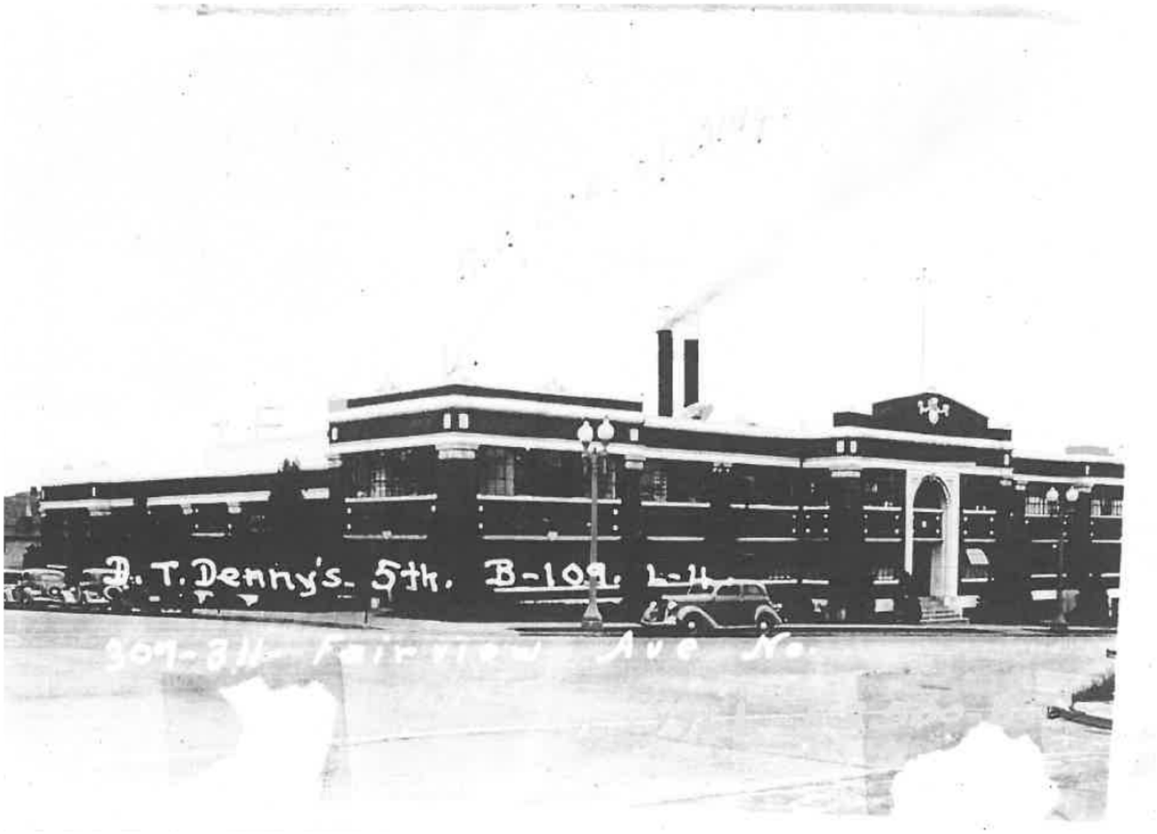
DRAFT INTERIM ACTION PLAN



Property:
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Prepared for:
Touchstone SLU LLC
2025 First Avenue, Suite 1212
Seattle, Washington

Report Date:
January 30, 2013

Draft Interim Action Plan

Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington 98121

Prepared for:

Touchstone SLU LLC
2025 First Avenue, Suite 1212
Seattle, Washington 98121

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January 30, 2013

SoundEarth Strategies

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ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
1,2-DCE	1,2-dichloroethelyne
µg/L	micrograms per liter
amsl	above mean sea level
ARAR	applicable or relevant and appropriate requirement
AST	aboveground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
cfm	cubic feet per minute
CFR	Code of Federal Regulations
cis-1,2-DCE	cis-1,2-dichloroethylene
COC	chemical of concern
CSM	conceptual site model
CVOC	chlorinated volatile organic compound
DHC	*Dehalococcoides*
DRPH	diesel-range petroleum hydrocarbons
Ecology	Washington State Department of Ecology
EDC	1,2-dichloroethane
EDR	Engineering Design Report
EOS	edible oil substrate
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
FS	feasibility study

ACRONYMS AND ABBREVIATIONS (CONTINUED)

FS Report	Draft Feasibility Study Report, prepared by SoundEarth Strategies, Inc. and dated August 9, 2012
GC/FID	Gas Chromatograph(y) Flame Ionization Detector
GPR	ground-penetrating radar
GRPH	gasoline-range petroleum hydrocarbons
HASP	Health and Safety Plan
HSA	hollow-stem auger
IAP	Draft Interim Action Plan, prepared by SoundEarth Strategies, Inc.
Maryatt	Maryatt Industries
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTCA	Washington State Model Toxics Control Act
NWTPH	Northwest Total Petroleum Hydrocarbon
O&M	operation and maintenance
ORPH	oil-range petroleum hydrocarbons
PAH	polycyclic aromatic hydrocarbons
PCE	tetrachloroethylene
PID	photoionization detector
the Property	307 Fairview Avenue North, Seattle Washington
PVC	polyvinyl chloride
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
REC	recognized environmental condition
RETEC	Remediation Technologies, Inc.

ACRONYMS AND ABBREVIATIONS (CONTINUED)

RI	remedial investigation
RI Report	Draft Remedial Investigation Report, prepared by SoundEarth Strategies, Inc. and dated May 2, 2012
ROW	right-of-way
SAP	Sampling and Analysis Plan
SES	Sound Environmental Strategies Corporation
SI	subsurface investigation
the Site	soil, soil vapor, and groundwater contaminated with gasoline-, diesel-, and oil-range petroleum hydrocarbons; tetrachloroethylene; trichloroethylene; cis-1,2-dichloroethylene; and/or vinyl chloride beneath the Property and beneath portions of the Boren Avenue North and Thomas Street rights-of-way, as well as trichloroethylene in groundwater beneath the Terry Avenue North right-of-way
SoundEarth	SoundEarth Strategies, Inc.
SPU	Seattle Public Utilities
SSI	supplemental subsurface investigation
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TCE	trichloroethylene
TESC	temporary erosion and sediment control
TIC	tentatively identified compound
Touchstone	Touchstone SLU LLC
TPH	total petroleum hydrocarbon
trans-1,2-DCE	trans-1,2-dichloroethylene
TSDF	treatment, storage, and disposal facility
USC	United States Code
USGS	U.S. Geological Survey
UST	underground storage tank

ACRONYMS AND ABBREVIATIONS (CONTINUED)

UTS	Universal Treatment Standard
VC	vinyl chloride
VOC	volatile organic compound
WAC	Washington Administrative Code

EXECUTIVE SUMMARY

SoundEarth Strategies, Inc. has prepared this Draft Interim Action Plan for the Troy Laundry Property located at 307 Fairview North in Seattle, Washington (the Property), on behalf of Touchstone SLU LLC. In accordance with the Washington State Model Toxics Control Act Regulation in Part 430 of Chapter 340 of Title 173 of the Washington Administrative Code, Touchstone SLU LLC initiated a remedial investigation to define the extent of contamination and characterize the Site (defined below) for the purpose of developing and evaluating the cleanup action alternatives summarized in the Draft Feasibility Study Report prepared by SoundEarth Strategies, Inc. and detailed in this Draft Interim Action Plan.

This Draft Interim Action Plan was prepared under the authority of Amended Agreed Order No. DE 8996 between Touchstone SLU LLC and Washington State Department of Ecology. The Draft Interim Action Plan was developed to meet the general requirements of an interim action plan as defined by the Washington State Model Toxics Control Act Regulation in Part 430 of Chapter 340 of Title 173 of the Washington Administrative Code.

Based upon the findings of the investigations summarized herein, to date the Site includes soil, soil vapor, and groundwater contaminated with gasoline-, diesel-, and oil-range petroleum hydrocarbons; tetrachloroethylene; trichloroethylene; cis-1,2-dichloroethylene; and/or vinyl chloride beneath the Property and portions of the Boren Avenue North and Thomas Street rights-of-way, as well as trichloroethylene in groundwater beneath the Terry Avenue North right-of-way. The impacts beneath the Property and the Boren Avenue North and Thomas Street rights-of-way likely are associated with a release of chlorinated and Stoddard solvents from the industrial laundry and dry cleaning facility that operated on the Property from 1927 to 1985. The highest concentrations of chlorinated and Stoddard solvents are located in the center of the Property near the loading dock. The trichloroethylene impacts identified within Terry Avenue North are a result of an upgradient source.

The Site is located on a topographically low-lying area within the downtown area of the City of Seattle. Elevations range from 68 feet (northwest corner of the Property) to 105 feet (southeast corner of the Property) above NAVD88 and slope toward the northwest. Lake Union is located approximately 0.4 miles to the north of the Site, and Elliot Bay is located approximately 1.5 miles to the west of the Site.

The Property was initially developed prior to 1893 with residences. Residences exclusively occupied the Property until 1925, when the Boren Investment building (hereafter referred to as the David Smith building) was constructed on the northwestern corner of the Property. The Troy Building was constructed between 1926 and 1927, and the Mokas Building was constructed in 1960. According to historical records, by 1948 the Property operated as one of the Pacific Northwest’s largest laundry and dry cleaning facilities. At least 15 underground storage tanks containing heating oil, fuel, and dry cleaning solvents, as well as several aboveground storage tanks containing propane, wash water, water-softening agents, dry cleaning solvents, and heating oil, were used on the Property.

Land use in the vicinity of the Property was primarily residential through the early 1900s, when the area transitioned toward commercial and light industrial use.

The results of previous subsurface investigations, the remedial investigation, and the supplemental remedial investigation conducted at the Site suggest that the chlorinated solvent impacts confirmed in soil and/or groundwater beneath the Property and portions of the Boren Avenue North and Thomas

Street rights-of-way are the result of a release from the laundry and dry cleaning facility that operated on the Property from 1927 through 1985. Although the type and location of dry cleaning operations conducted on the Property prior to 1964 could not be confirmed, historical building plans indicated that the bulk of the dry cleaning operations after the mid-1960s were conducted on the southwest portion of the Property. Consistent with this information, the highest concentrations of chlorinated solvents are located near the center of the Property by the loading dock. In addition, a deep zone (84 to 86 feet below ground surface) of soil contamination has been identified within Thomas Street. The source of the contamination has not been confirmed and is inconsistent with data and observations associated with earlier investigations conducted on the Property and within the adjoining rights-of-way.

Concentrations of tetrachloroethylene and its degradation products within the primary water-bearing zone, which is located at an approximate elevation of 15 to 18 feet above mean sea level, while above the applicable cleanup levels, are relatively low and fairly consistent across the Site. Tetrachloroethylene was detected in the monitoring well installed near the source area (MW11), as well as two of the wells completed within the Boren Avenue North right-of-way. Concentrations of cis-1,2-dichloroethylene were confirmed above the cleanup level only in deeper wells MW06 and MW09, and vinyl chloride was detected only in well MW06. Concentrations of trichloroethylene were detected above the cleanup level in groundwater samples collected from monitoring wells MW09 and MW12, which were screened 25 to 30 feet below the top of the primary water-bearing zone. The concentrations are consistent with those observed in other, shallower wells screened at the top of the primary water-bearing zone throughout the Site, and no chemical stratification is apparent.

Groundwater collected from the approximately 498-foot-deep supply well formerly located in the center of the Property did not contain detectable concentrations of chlorinated or Stoddard solvents. The results of sampling conducted at the well demonstrated that the deeper aquifer beneath the Site has not been impacted by a release from the former property operations.

The highest concentrations of tetrachloroethylene in soil are present beneath the center of the Property at depths ranging from 3 to 10 feet below ground surface. A very dense silt layer was encountered at depths between 12 and 20 feet below ground surface. The majority of the tetrachloroethylene contamination across the Property appears to be above the silt layer as evidenced by the significant drop in tetrachloroethylene concentrations within and beneath the silt (boring/sample P08-10 and P08-14). Considering the associated high concentration of tetrachloroethylene in the perched reconnaissance water sample collected from temporary boring B07 using push-probe technology, the presence of tetrachloroethylene as dense nonaqueous-phase liquid above this silt layer is probable.

Relatively consistent concentrations of tetrachloroethylene in soil appear to have migrated from the primary source area at the Property throughout the western half of the Property primarily through diffusion. Any migration upgradient of the source likely resulted from vapor-phase transport in the vadose zone over several years, as evidenced by the GORE Survey results and facilitated by the relatively loose sandy geology beneath those portions of the Site.

With the exception of the contamination found beneath Thomas Street between 84 and 86 feet below ground surface, tetrachloroethylene has generally migrated vertically through soil to depths of up to 65 feet below ground surface, or approximately 10 to 15 feet above the primary water-bearing zone, in the areas explored. Tetrachloroethylene contamination in soil extends east up to approximately the

EXECUTIVE SUMMARY (CONTINUED)

centerline of the Property, and it has migrated westerly up to the Property boundary. Based on the results of soil analytical data collected on and to the west of the Property, any soil contamination extending into the adjoining Boren Avenue North right-of-way is likely limited in extent.

Gasoline-range petroleum hydrocarbons as Stoddard solvent were also observed in soil and groundwater beneath the Site. In all samples where concentrations of gasoline-range petroleum hydrocarbons exceeded the Washington State Model Toxics Control Act Method A cleanup level in soil and groundwater, chlorinated solvents were also present.

Based on the results of the previous investigations and completion of a preliminary conceptual site model, the interim action described herein has been developed to remediate the portions of the Site that have been confirmed to be impacted as a result of the release at the Property. To the extent possible, the interim action also has been developed to be consistent with the requirements of a cleanup action in accordance with Washington State Model Toxics Control Act Regulation in Parts 360 through 400 of Chapter 340 of Title 173 of the Washington Administrative Code.

This Draft Interim Action Plan has been prepared based on the results of the Draft Feasibility Study Report and the findings of the supplemental remedial investigation conducted by SoundEarth Strategies, Inc. in December 2012. This document presents the methods proposed to remediate the contaminated soil and groundwater associated with the release from the former Troy Laundry operations. As part of the redevelopment, the Troy Laundry Property will generally be excavated from lot-line to lot-line; the final elevation of the excavation is anticipated to be between approximately 18 and 38 feet above NAVD88. The entire Property will be excavated to completely remove the identified chlorinated solvent- and petroleum-contaminated soil. The vertical extent of the remedial excavation will extend to approximately 19 feet above NAVD88. Approximately 97,540 tons of chlorinated solvent- and petroleum-contaminated soil will be excavated and disposed of off the Property. The estimated duration of the remedial excavation is 4 months, and the remedial excavation will be conducted as part of the larger redevelopment excavation.

If the deep soil contamination identified beneath the Thomas Street right-of-way resulted from a release at the Property, a soil vapor extraction system will be installed along the southern Property boundary. The soil vapor extraction system will target the thin zone of soil contamination identified during the installation of B50/MW16. Horizontal extraction wells will extend beneath the Thomas Street right-of-way. The recovered vapors will be monitored to assess the effectiveness of the system and mass recovery. The system conveyance piping will be installed prior to pouring the building foundation and routed to a system equipment enclosure.

After the final grades are achieved and prior to installing the building foundation, the remedial infrastructure required to treat the groundwater contamination plume using in situ reductive dechlorination would be installed. Angled borings/injection wells would be installed under the Boren Avenue North ROW that could provide access for the purpose of injecting an edible oil substrate and *Dehalococcoides* genus bacteria to treat the extent of the confirmed solvent plume. Edible oil substrate would be used as a carbon source to deplete dissolved oxygen present in the aquifer, generate free hydrogen, and sustain a robust anaerobic dechlorinating microbial population. The presence of degradation products in groundwater across the Site confirms that Site conditions are conducive to reductive dechlorination, and enhancing this naturally occurring process with edible oil substrate and *Dehalococcoides* will significantly reduce the remedial time frame.

Vertical injection wells would be installed on the Property on approximate 15-foot centers along transects to a depth of approximately 35 feet below the saturated zone. The relatively wide spacing of the injection wells along each transect is based on soil bulk density estimates developed by EOS Remediation, as well as the relatively permeable soil texture. This information was used to develop the approximate volume of edible oil substrate necessary to support a zone of anaerobic dechlorination sufficient to degrade the chlorinated solvents within groundwater beneath the Site.

Performance and confirmational vapor (if applicable) and groundwater monitoring will be conducted at the proposed compliance points following the completion of the cleanup activities. Vapor monitoring will continue until influent concentrations of chemicals of concern are below the laboratory detection limit or the soil vapor extraction system has de minimis mass recovery. Groundwater monitoring will continue until four consecutive quarters of compliant groundwater samples have been collected.

Upon completion of the contaminated soil excavation and system installation activities, Touchstone will submit an Initial Interim Action Completion Report documenting the removal of the contaminated soil and the as-builts of the remediation system(s) for review and approval by the Washington State Department of Ecology. Following collection of confirmational vapor and groundwater analytical data, Touchstone will submit an Interim Action Closure Report for review and approval by the Washington State Department of Ecology.

This executive summary is presented solely for introductory purposes, and the information contained in this section should be used only in conjunction with the full text of this report. A complete description of the project, Site conditions, investigation results, interim action objectives, implementation of the selected interim action, and associated compliance monitoring is contained within this report.

1.0 INTRODUCTION

SoundEarth Strategies, Inc. (SoundEarth, formerly Sound Environmental Strategies Corporation [SES]) has prepared this Draft Interim Action Plan (IAP) for the Troy Laundry Property located at 307 Fairview Avenue North in Seattle, Washington (the Property). The location of the Property is shown on Figure 1. This IAP was prepared under the authority of Amended Agreed Order No. DE 8996 between Touchstone SLU LLC (Touchstone) and the Washington State Department of Ecology (Ecology). The IAP was developed to meet the requirements of an IAP as defined by the Washington State Model Toxics Control Act (MTCA) Regulation in Part 430 of Chapter 340 of Title 173 of the Washington Administrative Code (WAC 173-340-430). In accordance with Parts 120 and 350 of Chapter 340 of Title 173 of WAC 173-340-120(4)(a) and 173-340-350(6), Touchstone has initiated a remedial investigation (RI) to define the extent of contamination and characterize the Site (defined below) for the purpose of developing and evaluating the cleanup action alternatives detailed in this IAP.

As discussed in the Draft Remedial Investigation Report (RI Report) prepared by SoundEarth (2012a), the Draft Addendum—Supplemental Remedial Investigation Report (SoundEarth 2012e), and below, the Site is defined by the full lateral and vertical extent of contamination that has resulted from the former operation of a dry cleaning facility on the Property. Based on the information gathered to date, the Site includes soil, soil vapor, and/or groundwater contaminated with gasoline-, diesel-, and oil-range petroleum hydrocarbons (GRPH, DRPH, and ORPH, respectively); tetrachloroethylene (PCE); trichloroethylene (TCE); vinyl chloride (VC); and/or cis-1,2-dichloroethylene (cis-1,2-DCE) beneath the Property and portions of the Boren Avenue North and Thomas Street rights-of-way (ROWs), as well as trichloroethylene in groundwater beneath the Terry Avenue North ROW (Figure 2).

1.1 PUBLIC PARTICIPATION

Consideration of public concerns is mandated under the MTCA cleanup regulation for an Ecology-led or potentially liable person-led cleanup action under an Agreed Order. A public participation plan may be prepared by Touchstone and Ecology prior to finalizing the cleanup action plan for the Site, in which case the public will have the opportunity to provide comments on the work performed to date and the proposed final cleanup action in accordance with WAC 173-340-600. The typical comment period is 30 days, unless otherwise determined by Ecology.

1.2 DOCUMENT PURPOSE AND OBJECTIVES

The purpose of this IAP is to satisfy the specific requirements of MTCA in accordance with the WAC 173-340-430. The IAP presents historical information regarding the source and extent of impacts beneath the Site and outlines the proposed plan to address the impacts that remain beneath the Site.

This IAP is organized into the following sections:

- **Section 2.0, Background.** This section provides a description of the Site features and location; a summary of the current and historical uses of the Site and adjoining properties; a description of the Site's environmental setting, including the local meteorology, geology, and hydrology; previous investigations; summary of the interim remedial action; and the chemicals of concern (COCs), media of concern, and the preliminary Site definition.

- **Section 3.0, Technical Elements.** This section presents the remedial action objectives (RAOs), applicable or relevant and appropriate requirements (ARARs), COCs, media of concern, development of the cleanup standards, and points of compliance.
- **Section 4.0, Interim Action.** This section provides a description of the interim action components that will be implemented in order to remediate soil and groundwater containing concentrations of COCs exceeding the cleanup levels beneath the Site.
- **Section 5.0, Interim Action Implementation Plan.** This section describes the components of the interim action, including the interim action implementation documents, engineering design components, and construction activities for the Site. In addition, it provides a management plan that describes the steps necessary in the event that previously unidentified contamination or underground storage tanks (USTs) are encountered during excavation activities.
- **Section 6.0, Compliance Monitoring.** This section describes the protection, performance, and confirmational monitoring that will be conducted as part of the IAP.
- **Section 7.0, Documentation Requirements.** This section describes the documentation to be provided as part of the interim action, and it includes a discussion of document management, waste disposal tracking, compliance reports, and phased Ecology completion letters.
- **Section 8.0, Limitations.** This section discusses document limitations.
- **Section 9.0, Bibliography.** This section lists the references used to prepare this document.

2.0 BACKGROUND

This section provides a description of the Site features and location; a summary of historical Site use; and a description of the local geology, hydrology, and land use pertaining to the Site. Historical documentation referenced in this section is provided in the RI Report (SoundEarth 2012a).

2.1 SITE LOCATION AND DESCRIPTION

The Site is comprised of two tax parcels and a portion of the Boren Avenue North ROW in the South Lake Union neighborhood of Seattle, Washington (Figure 1). The Site is defined by the extent of contamination caused by the releases of hazardous substances at the Property, as discussed in Section 1.0 above.

The Property and adjoining properties, including the ROW, affected by the release(s) from the Property are described in the following subsections and presented on Figure 2.

2.1.1 The Property

The Property is comprised of two tax parcels (King County parcel numbers 198620-0480 and 198620-0515) that cover approximately 108,571 square feet (2.5 acres) of land. The Property is listed as 307 Fairview Avenue North in Seattle, Washington. Touchstone currently owns the Property.

The Property is improved with three buildings. The 1925-vintage, single-story masonry warehouse building listed at 334 Boren Avenue North (the Boren Investment building; hereafter referred to as the David Smith Building) is used as a sales floor and storage for David Smith

Antiques, a home furnishings retailer and wholesaler. The masonry-framed structure has a tar and gravel roof and is heated by space heaters.

The original 1927-vintage building at 307 Fairview Avenue North (Troy Building) is presently used as storage space for Integrity Interior Solutions, as well as storage for David Smith Antiques. The current, expanded structure was formerly the main location of the Troy Laundry and commercial dry cleaning operations. The masonry-framed structure has a tar and gravel roof and is heated by a hot water furnace. Troy Building additions, which were constructed between 1943 and 1966, were formerly used for industrial laundry, fur storage (Fur Vault), a tumbling and cleaning area on the western portion of the Property, and a two-story reinforced concrete parking garage on the southwestern portion of the Property. The reinforced concrete structure is heated using space heaters.

The 1960-vintage, single-story, masonry-framed structure located at 329 Fairview Avenue North (Mokas Building) has recently been vacated by Mokas Café and Coffee Bar.

Potable water and sewer service are provided to the Property by Seattle Public Utilities. According to side sewer cards maintained by the Seattle Engineering Department, the sanitary sewer was initially connected to the Property between 1899 and 1903. Puget Sound Energy provides natural gas, and Seattle City Light provides electricity to the Property. Solid waste disposal and recycling services are provided by CleanScapes.

Property features are presented in plan view on Figure 3.

2.1.2 West-Adjoining Property

The west-adjoining property, located across the Boren Avenue North ROW at 301 and 345 Boren Avenue North, includes three tax parcels (King County parcel numbers 198620-0410, 198620-0418, and 198620-0420) that cover approximately 42,890 square feet (0.98 acres). A mixed-use development occupies the superblock bound by Terry and Boren Avenues North, and Harrison and Thomas Streets. The development was constructed in 2010 and includes two 12-story office/retail buildings and a 6-story underground parking garage, known as the Phase IV Buildings for the Amazon headquarters. Approximately half of this development extends farther west beyond the west-adjoining property. City Place IV LLC is the current owner of the west-adjoining property.

2.1.3 Boren Avenue North Right-of-Way

According to City of Seattle’s Arterial Classifications Zoning Map, the ROW is zoned as an access street. Boren Avenue North is recently paved with concrete panels and runs north-south. The ROW is comprised of two through lanes and parallel parking lanes on the west and east sides.

2.1.4 Thomas Street Right-of-Way

According to City of Seattle’s Arterial Classifications Zoning Map, the ROW is zoned as an access street. Thomas Street is paved with asphalt and concrete and runs east-west. The ROW is comprised of two through lanes and parallel parking lanes on the north and south sides.

2.2 LAND USE HISTORY OF THE SITE

The historical usage of each affected property, as defined in Section 2.1, is briefly summarized in the following subsections. A more detailed discussion, as well as selected aerial photographs, available King County Archived Records, City of Seattle archived building permit files, and files provided by the former

Property owner (Seattle Times) are provided in the RI Report (SoundEarth 2012a). Relevant historical features of the Property are depicted on Figures 3 and 4.

2.2.1 The Property

The Property was initially developed prior to 1893 with residences. Residences exclusively occupied the Property until 1925, when the David Smith Building was constructed on the northwestern corner of the Property. The Troy Building was constructed between 1926 and 1927 and expanded in the 1940s and the 1960s. The Mokas Building was constructed in 1960. According to historical records, by 1948, the Property operated as one of the Pacific Northwest's largest laundry and dry cleaning facilities. At least 15 USTs containing heating oil, fuel, and dry cleaning solvents, as well as several aboveground storage tanks (ASTs) containing propane, wash water, water-softening agents, dry cleaning solvents, and heating oil, were used on the Property. The dry cleaning and laundry facility was decommissioned in 1985, when the Property was sold to the Seattle Times. During site closure, most of the associated fixtures and waste material were removed from the Property and at least eight USTs were closed in place. Many of the USTs appear to have been removed after 1985, although the dates of their removal could not be confirmed. Seattle Times sold the Property to Touchstone in 2011. Current and historical Property features are presented on Figure 3.

2.2.2 West-Adjoining Property

The west-adjoining property was originally occupied by residences until around 1906, when a Feather Mill was constructed on the southern parcel of the property and then was subsequently used as a metal cleaning shop. The remaining residences were demolished by 1951, and the property was redeveloped with warehouses. All aboveground structures were demolished by 2009. The property was subsequently excavated and the existing Amazon Phase IV building was constructed on the property by 2010.

2.2.3 Boren Avenue North

Boren Avenue North was constructed prior to 1893 as an ungraded dirt road. Between 1893 and 1920, the ROW was regraded to elevations above the surrounding properties, sidewalks were constructed, and the street was paved with concrete. The ROW remained relatively unchanged until between 2007 and 2010, when Boren Avenue North was narrowed and repaved with concrete.

2.2.4 Thomas Street

Thomas Street (formerly Third Street) was constructed before 1893. Concurrent with the surrounding streets, Thomas Street was regraded and lowered in elevation by 25 feet in 1906, and in 1909, wood walkways were constructed along the street. By the early 1920s, the wood walkways were replaced with concrete. By 1922, Thomas Street to the east of Boren Avenue North was paved with asphalt; the Thomas Street/Boren Avenue North intersection and Thomas Street west of the intersection were paved with concrete. In 1925, the eastern half of the asphalt-paved section of Thomas Street bounded by Boren and Fairview Avenues North was repaved with concrete. A City Light transmission line was constructed beneath Thomas Street, east of Boren Avenue North, after 1926. Aerial photographs indicate that Thomas Street remained relatively unchanged between 1937 and 2012.

2.3 FUTURE LAND USE

The Property will be redeveloped into two 12-story office towers. The project will include the construction of a mixed-use development that will extend lot-line to lot-line. Development plans include two multistory towers that have approximately 800,000 square feet of office space, 5,000 square feet of retail space, and belowground parking to accommodate 800 vehicles. The development also includes approximately 1 acre of public open space between the two towers.

SoundEarth reviewed available online permit information for the Property and adjoining properties; the records did not indicate any permitted future land development projects. SoundEarth is unaware of any future land use plans for the adjoining properties or ROWs.

2.4 ENVIRONMENTAL SETTING

This section provides a summary of the environmental setting of the Site.

2.4.1 Meteorology

Climate in the Seattle area is generally mild and experiences moderate seasonal fluctuations in temperature. Average temperatures range from 60s in the summer to 40s in the winter. The warmest month of the year is August, which has an average maximum temperature of 74.90 degrees Fahrenheit (°F), while the coldest month of the year is January, which has an average minimum temperature of 36.00 °F.

The annual average rainfall in the Seattle area is 38.25 inches, with December as the wettest month of the year when the area receives an average rainfall total of 6.06 inches (IDcide 2011).

2.4.2 Topography

The Site and vicinity lie within the Puget Trough or Lowland portion of the Pacific Border Physiographic Province (U.S. Geological Survey [USGS 2011]). The Puget Lowland is a broad, low-lying region situated between the Cascade Range to the east and the Olympic Mountains and Willapa Hills to the west. In the north, the San Juan Islands form the division between the Puget Lowland and the Strait of Georgia in British Columbia. The province is characterized by roughly north-south-oriented valleys and ridges, with the ridges that locally form an upland plain at elevations of up to about 500 feet above mean sea level (amsl). The moderately to steeply sloped ridges are separated by swales, which are often occupied by wetlands, streams, and lakes. The physiographic nature of the Puget Lowland was prominently formed by the last retreat of the Vashon Stade of the Fraser Glaciation, which is estimated to have occurred between 14,000 and 18,000 years before present (Waitt Jr. and Thorson 1983).

The Site is located on a topographically low-lying area within the downtown area of the City of Seattle. Elevations range from 68 feet (northwest corner of the Property) to 105 feet amsl (southeast corner of the Property) and slope toward the northwest (King County iMAP 2011a). Lake Union is located approximately 0.4 miles to the north of the Site, and Elliot Bay is located approximately 1.5 miles to the west of the Site (USGS 1983).

2.4.3 Groundwater Use

A groundwater supply well historically operated on the Property in the vicinity of the water softening equipment in the Troy Building (Figure 3). This well was used to supply the laundry facility with water used in cleaning operations on the Property and was never used as a potable water source. The supply well was decommissioned by Richardson Well Drilling of Puyallup, Washington, on July 26, 2011.

According to the Ecology Water Well Logs database (Ecology 2011d), two water supply wells are located at 100 Fourth Avenue North, approximately 0.6 miles east-southeast of the Site. The two supply wells were installed on the property owned by Fisher Broadcasting in 1999 and 2001. The wells were drilled to depths of 148 and 155 feet below ground surface (bgs). Each well was fitted with 10 feet of screen from the well bottom. These water supply wells reviewed in Ecology's database encountered static water levels between 77 and 80 feet bgs, but appear hydrologically crossgradient from the water-bearing zone encountered in the monitoring wells installed at the Site. The purpose of the wells is unknown, but it is unlikely that they are used as a potable water source.

Seattle Public Utilities (SPU) provides the potable water supply to the City of Seattle. SPU's main source of water is derived from surface water reservoirs located within the Cedar and South Fork Tolt River watersheds. According to King County's Interactive Map for the County's Groundwater Program, there are no designated aquifer recharge or wellhead protection areas within several miles of the Site (King County iMAP 2011b).

2.5 GEOLOGIC AND HYDROGEOLOGIC SETTING

The following sections summarize the geologic and hydrogeologic conditions encountered beneath the Site.

2.5.1 Site Geology

Based on the results of the investigations summarized in later sections of this report, subsurface soil beneath the site consists primarily of Vashon-age glacial deposits, pre-Fraser nonglacial deposits, and possible pre-Fraser glacial deposits. The locations of the borings and wells advanced at the Site are shown on Figure 5. Cross sections depicting subsurface soil characteristics and geologic units encountered in the explorations are presented as Figures 6 and 7. Detailed boring logs with well construction details are included as Appendix E of the RI Report (SoundEarth 2012a) and as an attachment to the Draft—Supplemental Remedial Investigation Report (SoundEarth 2012e).

The subsurface soil beneath the Site is interpreted to consist of the following geologic units from youngest to oldest: Vashon recessional outwash deposits; ice-contact deposits of either Vashon age or pre-Fraser age; and pre-Fraser nonglacial deposits. These units are described in the following sections.

2.5.1.1 Vashon Recessional Outwash (Qvr)

Vashon recessional outwash deposits were encountered in many of the explorations located in the western and northern portions of the Site. The recessional outwash consists primarily of loose to medium dense, gray to brown, poorly graded fine to medium sands and sands with silt, with varying amounts of gravel. Intervals of silty sand and silt of varying thicknesses were observed throughout several of the borings advanced at the Site. Discontinuous deposits of dense to very dense gravel and sand with gravel were also encountered.

The recessional outwash deposits were encountered at the surface in borings located in the central, northern, and western portions of the Site, with thicknesses ranging from less than 10 feet to about 50 feet. The extent and thickness of the recessional outwash deposits appear to define a pre-existing northeast-southwest oriented erosional surface or channel located along the western margin of the Property. The recessional outwash deposits are absent at the surface along the eastern margin of the Site and increase in thickness along the western and northwestern portions of the Site (Figures 6 and 7).

2.5.1.2 Ice-Contact Deposits (Qi)

The dense to very dense, predominantly poorly-graded silty fine sands with varying gravel contents encountered above the pre-Fraser nonglacial deposits in the southern and eastern portions of the Site are interpreted to be ice-contact deposits (Figures 6 and 7). The ice-contact deposits were encountered at the surface, or immediately beneath a thin layer of recessional outwash deposits, and overlie the pre-Fraser nonglacial deposits. The ice-contact deposits ranged from about 10 to 25 feet thick, where encountered, in the borings located along the northern and eastern margins of the Site.

The corresponding age for these deposits could not be confirmed using the available subsurface data. Associated Earth Sciences, Inc., the geotechnical consultant for Touchstone, observed that some of the samples of the ice-contact deposits were effervescent in hydrochloric acid, which is often indicative of a pre-Fraser age for ice-contact deposits or glacial till.

2.5.1.3 Pre-Fraser Nonglacial Deposits (Qpfa)

A thick sequence of undifferentiated pre-Fraser deposits, interpreted to consist primarily of nonglacial alluvial deposits, was encountered beneath the recessional outwash and ice-contact deposits (Figures 6 and 7). The soil associated with the nonglacial alluvial deposits consists of very dense/hard, light brown to gray-brown, predominantly poorly graded fine to medium sands and sands with silts interbedded with silty fine sands. The gravel content in the samples was highly variable, with some discontinuous layers of gravel with sand. The color of these deposits is typically brown to light brown or gray-brown, with distinct, localized horizons of reddish brown oxidation that are semi-continuous across the Site. The physical characteristics observed in the samples indicate that individual layers within these pre-Fraser nonglacial deposits are discontinuous and grade laterally within specific depth intervals across the Site (Figures 6 and 7).

A bed of dark brown to orange to reddish brown silt and silty sand, with local organic-rich zones, was encountered at or near the top of the nonglacial deposits. This layer of organic-rich silt/silty sand is semi-continuous across the Site and appears to mark the interface with the overlying ice-contact or recessional outwash deposits.

The pre-Fraser deposits are at least 80 feet thick beneath the southern portion of the Site. The thickness decreases toward the north and northwest, corresponding to the increased thickness of the overlying recessional outwash deposits (Figure 7). The pre-Fraser nonglacial deposits extend to depths greater than about –21 feet NAVD88 based on the maximum depth explored (boring B31).

2.5.2 Site Hydrology

Two water-bearing zones were encountered during the Site investigations and are discussed below. Considering the significant elevation changes—and associated relative depths below ground surface—across the Site, discussions regarding elevation and depth are presented in elevations above NAVD88.

2.5.2.1 Perched Interval

An upper discontinuous water-bearing zone, referred to as the perched interval, was encountered in only four of the 59 borings advanced at the Property and is generally associated with coarser permeable zones overlying the uppermost dense silt layer in the pre-Fraser nonglacial deposits at elevations of approximately 75 feet above NAVD88. Recharge to the perched interval likely occurs within the vegetated slope in the center of the Property, the bottom of which is elevated just above the location of the perched water encountered during drilling.

2.5.2.2 Primary Water-Bearing Zone

A deeper continuous water-bearing zone, referred to as the primary water-bearing zone, occurs within the recessional outwash deposits and the pre-Fraser nonglacial deposits. The primary water-bearing zone comprises the shallowest contiguous aquifer beneath the Site, with elevations ranging from 15.3 to 18 feet above NAVD88. The primary water-bearing zone is a heterogeneous aquifer consisting of several geologic units that is hydraulically unconfined beneath most of the Site. Based on data obtained from MW16, this zone appears to transition to a semi-confined condition in the southern portion of the Site near Thomas Street. The bottom of the primary water-bearing zone was not encountered during the RI or supplemental RI activities, although an increase in silt content observed near the bottom of monitoring wells MW08, MW09, and MW12 might indicate a transition to an underlying aquitard.

The general direction of groundwater flow in the primary water-bearing zone is toward the southeast (Figures 8, 9, and 10). In December 2012, groundwater elevations ranged from 15.28 to 16.07 feet NAVD88, except in the vicinity of wells MW01, MW04, MW07, and MW15, which are located northwest and west of the Property. The elevations of these four monitoring wells ranged from 17.44 to 18.01 feet above NAVD88 (Figure 10). Average groundwater gradients across the Site were measured to be approximately 0.004 feet per foot toward the southeast and east during the December monitoring event, with steeper gradients in the northwest part of the Site, and flatter gradients in the central and southeast portions of the Site (Figure 10).

Groundwater flow directions and gradients for the primary water-bearing zone have been relatively consistent over all of the monitoring events. The groundwater flow characteristics for the primary water-bearing zone correspond to hydrogeologic conditions encountered at other sites in the South Lake Union area. Lake Union, which is located approximately 0.3 miles north of the Site, is located at an elevation of approximately 18 to 19 feet above NAVD88 (Hart Crowser 2008; King County iMAP application), and the shallow regional aquifer encountered within the South Lake Union area generally flows toward the southeast (Martin 2012). The findings of the Site investigations and the geotechnical findings for the property located adjacent to the west and southwest of the Site confirm that the primary water-bearing zone identified at the Site flows in a general southerly to southeasterly direction, away from Lake Union.

2.6 PREVIOUS INVESTIGATIONS

The following subsections summarize the results of previous investigations conducted at the Site. Sample locations and relevant Property features are presented on plan view on Figure 5. Analytical results are presented in plan and cross section view on Figures 11 through 17.

2.6.1 1986 Seattle Closure Report

Seattle Times prepared a Closure Report to document the decommissioning of the former dry cleaning facility in accordance with Washington's Dangerous Waste Standards for facility closure and post-closure, as described under WAC 173-303-610(a). The purpose of the report was to describe the methods Seattle Times would use to remove or decontaminate the dangerous waste that remained on the Property as a result of the former dry cleaning and laundry operations (Appendix D of the RI Report; SoundEarth 2012a).

The report identified the following chemicals stored on the Property: Stoddard solvents, wastewater and sludge, gasoline, and heating oil. At the time the report was prepared, approximately 5,000 gallons of new and used Stoddard solvents were pumped from the four solvent USTs. The interior USTs were filled with sand and closed in place and the exterior 8,000-gallon UST was removed in 1985.

The concrete floors on both the first (basement) and second stories of the Troy Building contained shallow drainage channels. These channels were used as catchments for fresh water when the Property operated as a dry cleaner and were reportedly connected to a separator pit. Both the first- and second-story channels were sampled. The first-story channels contained dangerous waste residue. The channels were reportedly cleaned and the hazardous material was disposed of at an approved facility.

In addition, the following storage vessels were sampled and/or decommissioned as part of the facility closure:

- **Two concrete pits.** The first concrete pit was presumably the pit that formerly housed the pressurized water tank and contained standing water. The second concrete pit was a separator pit that was used as a laundry wastewater pit and that contained standing water and solid residue. The results of analytical testing indicated that the water present in both pits was not considered dangerous waste and could be disposed of into the sewer system. The solid residue within the separator pit was determined to be nonhazardous and was disposed of at a landfill.

- **A sump, presumably the 6-foot-deep sump inside the 1964-vintage garage addition.** The sump contained an oily residue that was sampled and determined to be a "toxic dangerous waste." The sump and its associated piping were reportedly cleaned and the hazardous material disposed of at an approved facility. The sump was subsequently checked for leaks by Northwest Enviroservices, who reportedly confirmed that no leaks were present.

- **A fiberglass AST measuring 12 feet in diameter and 6 feet tall.** At the time the Closure Report was prepared, the AST contained approximately 5,000 gallons of metal-contaminated water and sludge. The AST was reportedly accepted for disposal at IPEC International of Vancouver. The report did not specify where the AST was located.

- **Four USTs.** Maryatt Industries (Maryatt) decommissioned two 12,000-gallon USTs and one 1,000-gallon UST containing heating oil, which were located in the parking lot to the north of the boiler room; Maryatt also decommissioned an 8,000-gallon UST containing gasoline, located in the parking lot of the Mokas building.

Because no evidence of leaks was observed during the decommissioning of the USTs, ASTs, or sumps discussed above, the report concluded that it was unlikely a release to the subsurface had occurred; therefore, soil and groundwater sampling was unwarranted. A June 25, 1986, letter from Ecology concurred with the report's conclusions.

Data Gaps. No soil or groundwater samples were collected to evaluate whether former dry cleaning operations conducted at the Property had resulted in impacts to the subsurface.

2.6.2 1994 RETEC Groundwater Supply Well Sampling

In October 1994, Remediation Technologies, Inc. (RETEC) sampled the groundwater supply well located inside the Troy Building. The purpose of the sampling event was to evaluate if the well was acting as a conduit for contamination into the subsurface. Prior to purging, water was observed at a depth of 73 feet below the top of the well casing, which extended approximately 1.5 feet above the floor of the building. The total depth of the well was measured at approximately 490 feet bgs. RETEC purged approximately 2,450 gallons of groundwater from the well at a rate of 3.5 gallons per minute. The purge water was discharged through a floor drain at the Property. At the time of sampling, pH was measured to be 9.88. The groundwater sample was submitted to the laboratory for analysis of volatile organic compounds (VOCs); semivolatile organic compounds (SVOCs); total petroleum hydrocarbons (TPH); metals, including arsenic, barium, cadmium, chromium, lead, selenium, silver; and polycyclic aromatic hydrocarbons (PAHs).

Groundwater Results. Concentrations of the VOCs, SVOCs, and PAHs were below the applicable 1989 MTCA Method A cleanup levels. A concentration of TPH of 420 micrograms per liter (µg/L) exceeding the 1989 MTCA Method A cleanup level was detected in the groundwater sample.

Data Gaps. Analytical methods and MTCA cleanup levels have since been modified.

2.6.3 2010 Phase I Environmental Site Assessment

SoundEarth conducted a Phase I Environmental Site Assessment (ESA) of the Property in 2010 (SES 2010a). The purpose of the Phase I ESA was to identify recognized environmental conditions (RECs) associated with the use, manufacture, storage, and/or disposal of hazardous or toxic substances at the properties in question. SoundEarth performed the following activities as part of the Phase I research:

- A review of selected historical sources, where reasonably ascertainable and readily available, was conducted in an attempt to document obvious past land use of the Property and adjoining properties back to 1940 or when the Property was initially developed, whichever is earlier. This included interviews with persons having some knowledge of current and past use of the Property; review of historical aerial photographs and topographic maps of the Property and surrounding area; review of city directories, Sanborn Fire Insurance Maps, county assessor's records, building department records, and information at various local agencies, as available.
- A review of current state and federal databases that list the registered sites with known or potential releases of toxic substances within a 0.5- to 1.0-mile radius from the Property (including the adjoining US Marine Bayliner site).
- A reconnaissance of the Property and vicinity to observe current Property conditions and practices to search for evidence of possible contamination in the

form of soil discoloration, odors, vegetative stress, discarded drums, discarded industrial debris, building construction materials, underground storage tanks, etc.

SoundEarth identified the following RECs associated with the Property:

- The former operation of a dry cleaning facility and large laundry plant on the Property from 1926 until 1985.
- The likely historical use and storage of heating oil in ASTs or USTs at the residences formerly located on the Property.
- The current and historical operation of automotive repair facilities to the south, southeast, and east of the Property.
- The current and historical operation of a large newspaper facility adjoining the south of the Property.

2.6.4 August 2010 GPR Survey, Soil Vapor, and Groundwater Sampling Events

Based on the findings of the Phase I ESA, SoundEarth conducted additional investigations on the Property. These investigations included a ground-penetrating radar (GPR) survey to evaluate the current status of the USTs identified during the Phase I ESA, a sampling event for the on-Property supply well located inside the Troy Building, and a GORE soil vapor survey to evaluate the potential for a release of petroleum hydrocarbons and/or VOCs to the subsurface (SES 2010a). The field activities and results of the investigations are summarized in the following subsections.

2.6.4.1 GPR Survey

On August 11, 2010, SoundEarth and Underground Detection Services, Inc. completed a GPR survey of the Property. The results of the GPR survey confirmed that the 8,000-gallon UST near the loading dock, the four 2,000-gallon gasoline USTs reportedly removed in 1965, the two 12,000-gallon heating oil USTs, and one 1,000-gallon heating oil UST associated with the Troy Building had been removed, as well as the second 8,000-gallon UST in the parking lot of the Mokas Building, However, the GPR survey identified two anomalies indicative of USTs. The first anomaly was located adjoining the southwest corner of Mokas Building. The second anomaly was located in the parking lot between the David Smith and Mokas buildings, in the vicinity of the former residence listed at 1119 Harrison Street and historically heated by an oil-burning furnace. Subsurface piping was observed beneath the parking lot outside of the boiler room of the Troy Building. No apparent USTs were observed, but asphalt patching in the area was indicative of a former UST excavation. The GPR survey confirmed the size of the UST beneath the sidewalk along Boren Avenue North. The fill port was opened and dipped; approximately 1 inch of heating oil was observed floating on approximately 1 foot of water. A second apparent fill port was observed farther south, but while conducting the GPR survey in the vicinity, fiber optic lines obscured the readings.

Two apparent excavation areas were identified north of the Mokas Building. The first excavation area was directly north of the building, and the second was beneath the parking spots to the northwest of the building. The northwesternmost area appears to be subsiding, which may be the result of poor backfill and compaction following excavation activities.

2.6.4.2 Groundwater Sampling Event

On August 26, 2010, a SoundEarth hydrogeologist collected groundwater grab samples from the supply well. Prior to bailing, water was observed at a depth of 75.25 feet below the top of the well casing, which extended approximately 1.5 feet above the floor of the building. The total depth of the well was approximately 498 feet bgs. Groundwater grab samples were collected using bailers at the top and bottom of the water column (75 and 490 feet, respectively). The groundwater samples were submitted to the laboratory for analysis of VOCs, PAHs, pH, GRPH, DRPH, ORPH, and Resource Conservation and Recovery Act (RCRA) 8 metals.

Groundwater Results. Laboratory analytical results indicated that the groundwater samples collected from the well did not contain detectable concentrations of PAHs, VOCs, or GRPH. Slightly elevated concentrations of DRPH and ORPH were detected in the 490-foot sample, but they were below the applicable MTCA Method A cleanup levels for groundwater. Concentrations of arsenic, lead, chromium, cadmium, and mercury were representative of background levels. Barium and pH were elevated slightly but their concentrations did not represent a risk to human health or the environment. The results of sampling conducted at the well demonstrated that the deeper aquifer beneath the Site has not been impacted by a release from the former Property operations.

Data Gaps. None.

2.6.4.3 GORE Soil Vapor Survey

A GORE Soil Vapor Survey was conducted in August 2011 to provide preliminary data regarding the type and sources of contamination suspected to be present beneath the Property. SoundEarth installed 67 passive-sampling GORE-Sorber modules at the Property within 2.5-foot-deep soil borings. The borings were advanced on a predetermined 40-foot grid using hand-held rotary hammer drills. After 7 days of passive sampling, the modules were collected and submitted to GORE for laboratory analysis of VOCs, including PCE; 1,2-dichloroethene (1,2-DCE); TCE, and TPH. Concentrations of the chemicals were plotted on isoconcentration maps for the Property. A copy of the GORE Soil Vapor Survey is provided in Appendix F of the RI Report (SoundEarth 2012a).

Soil Vapor Results. Detectable concentrations of PCE were observed to extend across much of the western half of the block, as shown on Figure 11. Concentrations that correlate with MTCA exceedances in soil observed at other, similar properties covered an area of the Property that measures approximately 60,000 square feet. Highly elevated PCE concentrations (hot spots) were observed near the former loading dock to the dry cleaning area, beneath the Fur Vault, and within the David Smith building, as shown on Figure 11. However, the elevated concentrations observed beneath the Fur Vault were in part due to overlap from extremely high concentrations observed near the loading dock; the model interpreted the highest concentrations to extend to the next sampling point.

TCE and 1,2-DCE, both of which are degradation products of PCE, were also observed on the western half of the block. The highest concentrations were likewise observed near the former loading dock, further indicating that the loading dock area represents the primary source area for the release of chlorinated solvents.

Concentrations of TPH and associated carbon chains were also highest in the vicinity of the former loading dock, and a second potential source area for TPH was identified to the northeast of the Mokas Building.

Data Gaps. The results of the GORE Soil Vapor Survey indicated that both the dry cleaner operations and the use and storage of hazardous materials at the Property had resulted in a release of VOCs and petroleum hydrocarbons beneath much of the Property and may extend beyond the Property boundaries. Additional investigations were necessary to evaluate potential soil and shallow groundwater impacts in the vicinity of soil vapor anomalies identified in the GORE isoconcentration maps.

2.7 SUBSURFACE INVESTIGATIONS

Three subsurface investigations (SIs) have been conducted at the Site since 2010. The locations of soil borings, monitoring wells, and other Property features are shown on Figure 5. The soil and groundwater analytical results are summarized on Figures 11 through 17 and in Tables 1 and 2. For evaluation purposes, those concentrations that exceed the current MTCA Method A or Method B cleanup levels for soil and groundwater are presented in bold red font in the tables. The remainder of this report includes references to cleanup levels; unless otherwise specified, these refer to the 2001 MTCA Method A or 2011 MTCA Method B Cleanup Levels for Unrestricted Land Use for soil and groundwater.

2.7.1 2010 Limited Phase II ESA

SoundEarth conducted a Limited Phase II ESA at the Property in October 2010 (SES 2010c). The purpose of the Phase II ESA was to evaluate the potential source areas identified during the GORE Soil Vapor Survey and Phase I ESA research, as well as the shallow lateral extent of contamination of COCs as indicated by the soil vapor isoconcentration maps provided by GORE. SoundEarth advanced 14 soil borings (P01 through P14) on the Property near the potential source areas to a maximum depth of 23 feet bgs (Figure 5). SoundEarth collected a reconnaissance groundwater sample from boring P10 during drilling activities on October 7, 2010, using a temporary screen installed from 19 to 21 feet bgs.

Selected soil samples and the reconnaissance groundwater sample were submitted for laboratory analysis of chlorinated VOCs (chlorinated volatile organic compounds [CVOCs] including (VC), cis-1,2-DCE and trans-1,2-dichloroethylene [trans-1,2-DCE], 1,2-dichloroethane [EDC], TCE, and PCE) by U.S. Environmental Protection Agency (EPA) Method 8260C; DRPH and ORPH by Northwest Total Petroleum Hydrocarbon (NWTPH) Method NWTPH-Dx; GRPH by Method NWTPH-Gx; and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260C.

Soil Results. Fill material composed of brick debris was encountered in boring P05 at ground surface to a depth of 2.5 feet bgs. PCE concentrations exceeding the applicable cleanup level were detected in soil samples collected from borings P03 and P05 through P11 at depths ranging from 2.5 feet bgs to the maximum depth explored of 23 feet bgs. The PCE concentrations detected in the soil sample collected from P05 at 5 feet bgs also exceeded Washington State's Dangerous Waste Regulations criteria (WAC 173-303). The PCE concentrations detected in soil samples collected from boring P08 at depths between 0 and 10 feet bgs exceeded ten times the Universal Treatment Standard (UTS) for PCE (60 milligrams per kilogram [mg/kg]), defined in Title 40, Chapter 1, Part 268, Subpart D of the Code of Federal Regulations (40 CFR §268.40-48 of Chapter 1). Soil that contains concentrations of PCE exceeding ten times the UTS is banned from land disposal without first being treated (land ban). Soil samples collected from P08 also contained concentrations of TCE exceeding the cleanup level at depths of 3, 7.5, and 10 feet bgs and DRPH and ORPH concentrations exceeding their respective cleanup levels at a depth of 10 feet bgs. GRPH was detected at concentrations exceeding the cleanup level in soil collected from boring P07 at a depth of 11 feet and boring P08 at 3, 7.5, and 10 feet bgs.

Concentrations of COCs were below cleanup levels and/or laboratory reporting limits in soil samples collected from borings P01, P02, P04, P12, P13, and P14. However, concentrations of PCE generally increased with depth in borings P01 and P02. BTEX, VC, cis-1,2-DCE, trans-1,2-DCE, and EDC were not detected at concentrations exceeding applicable cleanup levels or laboratory detection limits.

Groundwater Results. Perched groundwater was encountered in only one boring advanced during the SI. Analytical results indicated that DRPH, TCE, and PCE were present in the reconnaissance groundwater sample collected from P10 at concentrations exceeding applicable cleanup levels. All other COCs were below applicable cleanup levels and/or laboratory detection limits.

Summary. The results of the Limited Phase II ESA confirmed that the former use of the Property as a dry cleaning facility resulted in a release of solvents and petroleum hydrocarbons to the subsurface. The highest concentrations of PCE were confirmed near the loading dock for the Troy Building; soil concentrations in this area exceeded the land ban criteria, and perched groundwater, which was encountered in only one soil boring, also contained elevated concentrations of PCE.

Data Gaps. Neither soil nor groundwater contamination was bound vertically or horizontally.

2.7.2 2010 Subsurface Investigation

AECOM conducted an SI on December 8, 2010, in an effort to further delineate the lateral extent of the dangerous waste concentrations of PCE observed during the October 2010 investigation (AECOM 2011a). AECOM oversaw the advancement of seven soil borings (B01 through B07) during the SI (Figure 5). Borings B01 and B07 were advanced outside of the Troy Building in the vicinity of the loading dock, borings B02 through B05 were advanced in the north interior portion of the 1964-vintage addition of the Troy Building, and B06 was advanced inside the Fur Vault. Borings B01 through B05 were advanced to depths between 18 and 20 feet. Boring B06 was advanced to a depth of 11.5 feet, and B07 was advanced to a depth of 40 feet bgs. AECOM collected a reconnaissance groundwater sample from boring B07 using a temporary screen installed from 23 to 24 feet bgs. Select soil samples from borings B01, B02, and B04 through B07, as well as the reconnaissance groundwater sample, were submitted to the laboratory for analysis of VOCs (including benzene, cis-1-2,-DCE, TCE, and PCE) by EPA Method 8260C, DRPH and ORPH by Method NWTPH-Dx, and GRPH by Method NWTPH-Gx.

Soil Results. Soil samples collected from boring B01 through B07 contained concentrations of PCE exceeding the cleanup level at every interval sampled to the maximum depth of 40 feet bgs. Concentrations of PCE detected in soil samples collected from boring B02 at depths between 7 and 11 feet and from boring B04 at depths between 8 and 10 feet bgs also exceeded Washington State’s Dangerous Waste criteria (WAC-173-303).

Concentrations of TCE, cis-1-2-DCE, and/or benzene were detected in borings B01 through B05 and B07, but were below the applicable cleanup levels. GRPH, DRPH, and ORPH were not detected in any of the borings.

Groundwater Results. Perched groundwater was encountered in only one boring advanced during the SI. Analytical results indicated that concentrations of GRPH, DRPH, TCE, cis-1,2-DCE, and PCE in the reconnaissance groundwater sample collected from B07, which was advanced near the loading dock, exceeded applicable cleanup levels. The concentrations of ORPH and trans-1,2-DCE were below applicable cleanup levels and/or laboratory detection limits. The results for additional analytes were not provided for SoundEarth's review.

Summary. Data collected during the December 2010 SI were consistent with the data collected during the October 2010 SI.

Data Gaps. Soil and groundwater contamination were not bound vertically or horizontally in any direction during the investigation. In addition, as with the previous investigations, the presence of only chlorinated solvents and petroleum hydrocarbons was evaluated. Additional potential COCs may include SVOCs and other VOCs not included within the list of chlorinated VOCs previously analyzed.

2.7.3 May 2011 Supplemental Subsurface Investigation

In May 2011, SoundEarth conducted a supplemental subsurface investigation (SSI) at the Site (SoundEarth 2011a). The purpose of the SSI was to evaluate (1) if the release of dry cleaning solvents and petroleum hydrocarbons confirmed in previous investigations had impacted soil and/or groundwater beyond the Property boundaries, (2) whether any additional constituents contaminated soil or groundwater beneath the Property beyond what was analyzed in previous investigations, and (3) the vertical extent of contamination beneath the Site.

A total of eight soil borings were advanced during the investigation: three within the Harrison Street ROW (B08 through B10), three within the Boren Avenue North ROW (B11, B12, and B15), and two on the Property (B13 and B14) to depths ranging from 61 to 90 feet bgs. Conductor casing was used in borings B13 and B14 at intervals deeper than 20 feet bgs to prevent the vertical migration of contamination from overlying soil. Borings B08 through B13 and B15 were completed as permanent monitoring wells MW01 through MW07, respectively.

On May 26, 2011, SoundEarth collected a reconnaissance groundwater sample from boring B14 using a disposable bailer. On May 25, 26, and 27, 2011, groundwater samples were collected from monitoring wells MW01 through MW07. Select soil and groundwater samples were submitted for laboratory analysis of full-suite VOCs (including VC, cis-1,2-DCE, trans-1,2-DCE, 1,1-DCE, EDC, benzene, TCE, PCE, and BTEX) by EPA Method 8260C; DRPH and ORPH by Method NWTPH-Dx; GRPH by Method NWTPH-Gx; and SVOCs by EPA Method 8270D. Soil samples were also submitted for analysis of total metals, including arsenic, cadmium, chromium, lead, mercury, selenium, barium, and silver (RCRA 8 metals) in accordance with EPA Methods 200.8 and 1631E; and, for the purposes of waste characterization, composite soil samples were submitted for analysis of CVOCs and RCRA 8 metals.

Soil Results. The concentration of PCE detected in boring B12 at 60 feet bgs slightly exceeded the cleanup level. Soil collected from boring B13, which was advanced on the Property to the south of the David Smith Building, contained a concentration of GRPH in excess of the cleanup level at a depth of 49 feet bgs. Soil collected from boring B13 at depths of 24 and 49 feet bgs contained concentrations of PCE in excess of the cleanup level. Soil collected from boring B14, which was advanced approximately 60 feet north of the loading dock on the Property, contained concentrations of PCE in excess of the cleanup level at depths of 30 and 58 feet bgs and concentrations of GRPH in excess of the cleanup level at depths of 30, 33.5, and 58 feet bgs.

Soil samples collected from borings B08 through B11 and boring B15 did not contain detectable concentrations of COCs. Soil collected from boring B12 contained detectable concentrations of PCE at depths between 55 and 70 feet bgs, where groundwater was encountered. The borings (B13 and B14) installed on the Property exhibited two zones of contamination—the first was encountered between 24 and 33.5 feet bgs, and the second was observed between 44 and 61 feet bgs. Soil samples collected above and below these depths did not contain detectable concentrations of chlorinated solvents or petroleum hydrocarbons.

Groundwater Results. Perched groundwater was not encountered during the SSI. Groundwater samples collected from each of the monitoring wells were considered to be representative of the primary water-bearing zone beneath the Site. Concentrations of TCE ranged from nondetect (<1 µg/L in monitoring wells MW01 and MW03) to 16 µg/L (monitoring well MW05). PCE was detected at concentrations exceeding the MTCA Method A cleanup level in the reconnaissance sample collected from B14 (35 µg/L) and the groundwater sample collected from MW05 (39 µg/L). VC and cis-1,2-DCE also were detected above the cleanup level in the groundwater sample collected from MW06.

Summary. Based on the data gathered during the SSI, soil contamination generally appears to be limited to within the Property boundaries; none of the soil samples collected from borings installed within the ROWs contained concentrations of PCE that exceeded the MTCA Method A cleanup level, with the exception of B12/MW05, where a sample collected at a depth of 60 feet contained a concentration of PCE of 0.057 mg/kg.

Groundwater beneath the western half of the Property and within Boren Avenue North exhibited elevated concentrations of PCE, TCE, cis-1,2-DCE, and/or VC. The highest concentration of PCE was 39 µg/L, which was detected in groundwater collected from monitoring well MW05. Monitoring well MW05 was advanced in the Boren Avenue North ROW. With the exception of groundwater collected from well MW05, only TCE was detected above the cleanup level in groundwater collected from the wells in the ROW.

Data Gaps. The lateral and vertical extent of impacts in soil to the south and east of the source area, as well as the eastern, western, and southern extent of contamination in groundwater, remained undefined.

2.8 INTERIM REMEDIAL ACTION

In February 2011, AECOM, on behalf of Seattle Times and Century Pacific, LP, designed and installed a soil vapor extraction (SVE) system at the Property to address the concentrations of PCE in soil that exceeded the dangerous waste threshold of 1.9 mg/kg. A summary of the interim remedial objectives, system design, and results of system operation are described in the following sections.

2.8.1 Interim Remedial Action Objectives

The objective of the SVE system was to eliminate or reduce the generation of dangerous waste as defined by the Washington State Dangerous Waste Regulations (WAC-173-303) by reducing the concentrations of COCs in unsaturated zone soil to below MTCA Method B cleanup levels.

Reducing the concentrations of COCs below MTCA Method B cleanup levels would enable the excavation and offsite disposal of the soil as non-hazardous waste.

2.8.2 System Design and Installation

The system utilized a 500 standard cubic feet per minute positive displacement blower to apply a vacuum to the network of 4-inch-diameter, Schedule 40 polyvinyl chloride (PVC) SVE wells. Five SVE wells were located outside of the Troy Building (wells SVE-1 through SVE-5); and two wells were located inside the building (wells SVE-7 and SVE-8). The interior wells were installed to 23 feet bgs with a 0.010-inch slotted screen section running from 10 feet to 22 feet bgs. The exterior wells were installed to 20 feet bgs with a 0.010-inch slotted screen section running from 7 feet to 19 feet bgs. The vacuum pressure created by the blower drew air into the well casing from the vadose zone. The extracted vapor traveled aboveground to the remediation compound through horizontal 2-inch-diameter header pipes. Inside the remediation compound, the vapor stream passed through a 50-gallon vapor/liquid separator (knockout tank) to remove moisture and particulates. Liquids and particulates were pumped from the knockout tank into a 5,000-gallon holding tank. The vapor then passed through 1,000-pound capacity primary and secondary granular activated carbon canisters to remove VOCs, and was then discharged into the atmosphere. Both the knockout and holding tanks were equipped with secondary containment controls. The SVE wells were equipped with sample ports to allow field personnel to collect performance vapor samples. The SVE system as-built diagrams are presented in Appendix G of the RI Report (SoundEarth 2012a).

2.8.3 Operation and Maintenance Activities

AECOM conducted monthly operation and maintenance (O&M) activities for the SVE system between February and December 2011. AECOM provided SoundEarth with a summary of monthly O&M results conducted between February and October 2011. The available reported data includes the flow rate, loading rate, estimated mass of total VOCs extracted, and laboratory analytical results of vapor samples collected from each of the seven SVE wells analyzed by modified EPA Method TO-15. The results of the analyses were summarized by AECOM in tabular and graphic form, a copy of which is provided in Appendix H of the RI Report (SoundEarth 2012a). Monthly O&M reports were prepared by AECOM and submitted to Century Pacific, LP, and Seattle Times under separate cover.

2.8.4 Post-Interim Action Confirmation Soil Sampling

On January 16, 2012, AECOM oversaw the decommissioning of the SVE wells and the installation of ten soil borings (B39 through B48) within the anticipated radius of influence of the SVE system (Figure 18). Soil samples collected from borings B39 through B45 were analyzed for the presence of solvents in accordance with EPA Method 8260C. The results of the confirmational soil sampling event indicated that concentrations of PCE in soil that previously exceeded the land ban criteria (60 mg/kg) had dropped to below the land ban criteria; however, the analytical results of soil samples collected from borings B39, B44, and B45 indicated that concentrations of PCE in excess of the dangerous waste criteria of 1.9 mg/kg remained beneath a small portion of the Site (Figure 18; Table 1). A copy of the data set provided by AECOM is presented in Appendix H of the RI Report (SoundEarth 2012a).

2.9 SUMMARY OF THE REMEDIAL INVESTIGATION

SoundEarth conducted an RI at the Site in September and October 2011. The objectives of the RI included the following:

- Address on-Property data gaps for soil and groundwater.
- Evaluate, to the extent possible, the extent of groundwater contamination to the south, east, and west of the source area.
- Evaluate the vertical gradient of contamination in groundwater.
- Analyze standing water remaining within pipes, sumps, and trenches inside the Troy Building for waste characterization purposes.
- Collect sufficient data to conduct a feasibility study (FS) and ultimately develop a cleanup action plan for the Site.

As indicated above, soil boring and monitoring well locations were selected to address the data gaps identified during previous investigations. Properties adjoining the ROWs include lot-line to lot-line buildings, structures with up to six levels of belowground parking, and ongoing construction activities. The physical limitations associated with drilling west of the groundwater contamination previously confirmed in Boren Avenue North precluded additional investigation of the western bound of contamination.

2.9.1 Soil Boring Advancement and Sampling

The drilling and well installation activities conducted as part of this RI were performed from September 26 to October 19, 2011. Drilling activities were conducted under the supervision of a SoundEarth geologist. Twenty-three borings (B16 through B38) were advanced at the Site to a maximum depth of 110 feet bgs. The borings were advanced by Cascade Drilling, LP, of Woodinville, Washington, using either full-size, truck-mounted hollow-stem auger (HSA) or limited-access HSA drill rigs. Conductor casing was installed in two borings (B30/MW11 and B31/MW12). Conductor casing was installed from 0 to 20 feet bgs in B30/MW11 to prevent the downward migration of contaminated perched groundwater encountered at 18 feet bgs. Casing also was installed from 0 to 70 feet bgs in B31/MW12 to provide a barrier between the top of the primary water-bearing zone and the lower portion of the primary water-bearing zone in an effort to mitigate downward migration of contamination through the water table.

After the maximum depth was achieved in each sample interval, relatively undisturbed, discrete soil samples were collected from each soil boring at 5-foot intervals throughout the maximum depth explored. Soil samples were collected from the center of the core sample to avoid cross-contamination. The soil was classified using the Unified Soil Classification System. Soil characteristics, including moisture content, relative density, texture, and color, were recorded on boring logs, provided in Appendix E of the RI Report (SoundEarth 2012a). The depths at which changes in soil lithology were observed and where groundwater was first encountered are also included on the boring logs. Selected portions of recovered soil core samples were placed in a plastic bag so the presence or absence of VOCs could be quantified using a photoionization detector (PID). Soil samples were selected for analysis based on previous data, field indications of potential contamination, including visual and olfactory notations, PID readings, and/or the location of the sample proximate to the soil-groundwater interface.

After collection, soil samples were labeled with a unique sample ID, placed on ice in a cooler, and delivered to Friedman & Bruya, Inc. of Seattle, Washington, under standard chain-of-custody protocols for laboratory analysis. Select soil samples were submitted for laboratory analysis of CVOCs by EPA Method 8260C. In addition, samples exhibiting elevated PID readings and odor indicative of Stoddard solvents were analyzed for GRPH by Method NWTPH-Gx and BTEX by EPA Method 8021B.

Photographs taken during the RI pre-field and field activities are included as an attachment to the RI Report (SoundEarth 2012a).

2.9.2 Monitoring Well Installation

Borings B26, B27, B28, B30, B31, B37, and B38 were completed as monitoring wells MW08 through MW14, respectively. Each monitoring well was constructed of 2-inch-diameter blank PVC casing, flush-threaded to 0.010-inch slotted well screen. The bottom of each of the wells was fitted with a threaded PVC bottom cap, and the top of each well was fitted with a locking compression-fit well cap. The annulus of the monitoring wells was filled with #10/20 silica sand to a minimum height of 1 foot above the top of the screened interval. A bentonite seal with a minimum thickness of 1 foot was installed above the sand pack. The wells were completed at the surface with a flush-mounted, traffic-rated well box set in concrete. The well completion details are presented in Table 2 and in the boring logs, which are provided in Appendix E of the RI Report (SoundEarth 2012a).

Two water-bearing zones were identified during drilling activities: a discontinuous perched zone at depth of approximately 18 to 25 feet bgs (depending on location on the Site) and a laterally continuous, deeper zone at depths between 60 and 95 feet bgs (depending on the location of the well/boring on the Site); the Property elevation drops approximately 35 feet from the southeast corner to the northwest corner of the Property. During drilling activities, the perched zone was only encountered in borings B20, B21, and B30/MW11 and, with the exception of B30/MW11, did not produce sufficient water to sample. Because the perched zone is discontinuous, all monitoring wells installed during the RI were screened in the primary water-bearing zone. As with the wells installed at the Site in May 2011, monitoring wells MW10, MW11, MW13, and MW14 (shallow wells) were constructed with 15 feet of screen set at approximately 5 feet above the water table (as observed during drilling) and 10 feet below the water table.

Monitoring wells MW08, MW09, and MW12 (deep wells) were completed to between 30 and 35 feet below the water table (as observed during drilling) and constructed with 5 feet of screen at the bottom of the well in an effort to assess any vertical differences in groundwater chemistry 30 to 35 feet below the top of the primary water-bearing zone.

2.9.3 Groundwater Monitoring Event

A groundwater monitoring event was conducted on at the Site in October 2011, and included the collection of groundwater measurements and samples from monitoring wells MW01 through MW14. Due to street use limitations, wells located within the City of Seattle’s ROWs had to be sampled in three phases so as not to disrupt traffic flow surrounding the Property. Groundwater samples were collected from monitoring wells MW01, MW02, and MW03 on October 11; monitoring wells MW04 through MW07 and MW10 on October 12; monitoring wells MW08, MW09, and MW11 on October 13; monitoring well MW12 on October 17; and monitoring wells MW13 and MW14 on October 20, 2011. Groundwater samples were collected from each monitoring well in accordance with EPA's Low Flow (Minimal Drawdown) Ground-Water Sampling Procedures (April 1996) at least 24 hours following well development. Groundwater measurements were collected from all of the wells on October 20, 2011, relative to the top of well casings to an accuracy of 0.01 feet using an electronic water meter. Purging and sampling of each well was performed using a bladder pump and dedicated polyethylene tubing. During purging, water quality parameters that were monitored and recorded included temperature, pH, specific conductivity, dissolved oxygen, turbidity, and oxidation-reduction potential. Each well was purged until, at a minimum, pH, specific conductivity, and turbidity or dissolved oxygen stabilized. Samples were placed directly in to clean, laboratory-prepared containers.

After collection, groundwater samples were labeled with a unique sample ID, placed on ice in a cooler, and delivered to Friedman & Bruya, Inc. under standard chain-of-custody protocols for laboratory analysis. Groundwater samples were submitted for laboratory analysis of CVOCs by EPA Method 8260C (unpreserved sample containers were used for VC analyses), GRPH by Method NWTPH-Gx, DRPH and ORPH by Method NWTPH-Dx, and BTEX by EPA Method 8021B.

2.9.4 Remedial Investigation Results

Analytical results for soil and groundwater samples collected during the RI are presented on Figures 11 through 17 and in Tables 1 and 2. Laboratory analytical reports are included as Appendix I of the RI Report (SoundEarth 2012a).

2.9.4.1 Soil Results

The following is a summary of the soil analytical data generated during the RI conducted by SoundEarth in September and October 2011:

Troy Building

- PCE was detected at concentrations exceeding the cleanup level in soil samples collected from boring B16, which was advanced within the 1964-vintage addition, at depths of 6, 16, 23.5, 25, and 50 feet bgs. Concentrations of PCE below the cleanup level were detected to the maximum depth explored of 70 feet bgs.
- PCE was detected at concentrations exceeding the cleanup level in the soil boring B17, which was advanced within the 1964-vintage addition, at depths of 11, 16, 40, 45, 50, 55, 60, and 65 feet.
- PCE was detected at concentrations exceeding the cleanup level in boring B18, which was advanced within the 1964-vintage addition, at depths between 25 and 65 feet bgs. PCE was also detected in the soil sample collected from boring B18 at a depth of 70 feet, but the concentration was below the cleanup level.
- PCE was detected at concentrations exceeding the cleanup level in soil samples collected from borings B19 at 25 feet, B20 at 15 feet, and B21 at 5 feet, each of which were advanced within the 1964-vintage addition, and B36 at 40 feet bgs. Samples collected from boring B36 at depths of 15 and 30 feet bgs contained low but detectable concentrations of PCE.

- With the exception of borings B16 and B18, concentrations of PCE did not exceed the laboratory detection limits in samples collected from any of the borings at depths greater than 65 feet bgs.
- GRPH and total xylenes were detected at concentrations exceeding the cleanup level in the soil sample collected from boring B20 at depths of 15 and 25 feet bgs. Boring B20 was advanced in the 1964-vintage addition.

David Smith Building

- A low but detectable concentration of PCE was observed in boring B34 at a depth of 50 feet bgs.
- Soil samples collected from borings B33 and B35 did not contain detectable concentrations of any COCs.

Exterior Borings

- Concentrations of PCE were detected in soil samples collected from boring B30, which was advanced to the north of the loading dock, at a depth of 18 feet bgs. However, the concentrations were below the applicable cleanup level.
- A concentration of GRPH exceeding the cleanup level was detected in the soil sample collected from boring B30 at a depth of 40 feet bgs. The 40-foot sample collected from boring B30 also contained detectable concentrations of ethylbenzene and total xylenes, but the concentrations were below the applicable cleanup levels. The GRPH exceedances are attributed to Stoddard solvent contamination (Figure 14).

Benzene, toluene, VC, cis-1,2-DCE, trans-1,2-DCE, EDC, and TCE were not detected at concentrations above their respective laboratory detection limits in any of the soil samples collected as part of the RI. Soil samples collected from borings B22 through B29, B31, B33, B35, B37, and B38 did not contain any detectable concentrations of COCs.

2.9.4.2 Groundwater

The following is a summary of the groundwater analytical results generated during the RI:

Shallow Wells

- Concentrations of PCE exceeded the cleanup level in groundwater samples collected from monitoring wells MW05 (29 µg/L), MW11 (21 µg/L), and MW13 (5.1 µg/L, which is only 0.1 µg/L above the cleanup level). Concentrations of PCE that did not exceed the cleanup level were detected in groundwater samples collected from monitoring wells MW06 and MW07.
- Concentrations of TCE exceeding the cleanup level were detected in groundwater samples collected from monitoring wells MW04 (15 µg/L), MW05 (14 µg/L), MW06 (11 µg/L), and MW07 (11 µg/L). TCE concentrations were also detected in groundwater samples collected from monitoring wells MW02, MW11, and MW13, but were below the cleanup level. These data suggest that natural attenuation of the PCE is occurring at the Site.

- Concentrations of VC (0.76 µg/L) and cis-1,2-DCE (120 µg/L) exceeded the applicable cleanup levels in the groundwater sample collected from MW06. Detectable concentrations of cis-1,2-DCE were observed in groundwater samples collected from monitoring wells MW05 and MW11 but were below cleanup levels. VC was not detected in groundwater samples collected from MW01 through MW05, and MW07 through MW14. These data suggest that natural attenuation of the PCE is occurring at the Site.
- Concentrations of DRPH below the cleanup level were detected in groundwater samples collected from monitoring wells MW06, MW07, MW09, MW10, MW11, MW13, and MW14. The concentrations of DRPH observed in these groundwater samples were flagged by the laboratory, indicating that the DRPH concentrations detected in the groundwater samples were likely a result of overlap from another fuel type (e.g., aged Stoddard solvents). DRPH was not detected in groundwater samples collected from monitoring wells MW01 through MW05.
- Concentrations of ORPH, benzene, toluene, trans-1,2-DCE, and EDC were not detected in any of the groundwater samples collected as part of the RI.
- Groundwater samples collected from monitoring wells MW01 and MW03, which are located in the Harrison Street ROW to the north of the Property, did not contain any detectable concentrations of COCs.

Deep Wells

- Concentrations of GRPH (1,400 µg/L), TCE (16 µg/L), and cis-1,2-DCE (22 µg/L) exceeding the applicable cleanup levels were detected in the groundwater sample collected from monitoring well MW09.
- Concentrations of DRPH, ethylbenzene, and total xylenes were detected in the groundwater sample collected from monitoring well MW09 but were below the applicable cleanup levels. The DRPH result was flagged as overlap from another fuel type (e.g., aged Stoddard solvents).
- Groundwater collected from monitoring well MW12 contained a concentration of TCE (19 µg/L) that exceeded the cleanup level.
- Groundwater samples collected from monitoring well MW08 did not contain any detectable concentrations of COC.

2.9.5 Remedial Investigation Conclusion

The borings and monitoring wells advanced and/or installed as part of this RI represent SoundEarth's reasonable efforts to evaluate the Site under the access limitations typical of a dense urban environment. However, following the completion of the RI, empirical data gaps remain for the Site and include the following:

- The lateral extent of groundwater contamination beyond Boren Avenue North to the west of the Site; however, data collected from wells completed along the west side of the Boren Avenue North ROW indicate that the concentrations of solvents in the groundwater are relatively low and limited in extent. To further validate this expectation, the Site data was input to a model that applied the most conservative, worst-case assumptions. As a result of the analysis, the contaminated groundwater plume appears to extend a maximum of 40 feet upgradient to crossgradient beneath the west-adjoining property.

- The lateral extent of groundwater contamination to the south of monitoring well MW09; however, data collected from MW09 indicate that the concentrations of contaminants in the groundwater are relatively low and limited in extent. To further validate this expectation, the Site data was input to a model that applied the most conservative, worst-case assumptions. As a result of the analysis, the contaminated groundwater plume does not appear to extend beneath the south-adjoining property.

The objective of addressing the data gaps is to provide empirical data to the extent possible to demonstrate an accurate site boundary to the south and west. Considering the technical limitations associated with acquiring empirical data to closely define the Site, a detailed, Site-specific mathematical model was developed to address the data gaps in areas where empirical data could not be collected (SoundEarth 2012a) and in an effort to ensure that the cleanup proceeds in a timely manner (WAC 173-340-350[6]). Considering the volume and quality of data gathered during the RI, the conceptual site model (CSM) developed as a result of the RI is considered sufficient to develop and evaluate permanent and practicable cleanup alternatives, which will include full source removal and large-scale groundwater treatment, as discussed in later sections of this report.

2.10 SUMMARY OF THE SUPPLEMENTAL REMEDIAL INVESTIGATION

SoundEarth conducted supplemental RI activities at the Site in December 2012 following the sampling procedures and protocols outlined in the Addendum to the Draft Remedial Investigation Report and Draft Feasibility Study prepared by SoundEarth and dated October 9, 2012 (SoundEarth 2012c), and an opinion letter from Ecology dated November 7, 2012 (Ecology 2012). The objectives of the supplemental RI included the following:

- Evaluate the western extent of groundwater impacted by the solvent release associated with the Site.
- Evaluate the southern extent of groundwater impacted by the solvent release associated with the Site.

Monitoring well locations were selected based on the objectives above and accessibility. The physical limitations associated with drilling on the west-adjoining property required the installation of the westernmost well (MW15) approximately 1 block west of the Site within the Terry Avenue North ROW. Monitoring well MW16 was completed just south of the centerline of Thomas Street (Figure 5).

2.10.1 Soil Boring Advancement and Sampling

The drilling and well installation activities conducted as part of this supplemental RI were performed from December 5 through 7, 2012. Drilling activities were conducted under the supervision of a licensed SoundEarth geologist. Two borings, B49 and B50, were advanced to maximum depths of 56 and 106 feet bgs, respectively. The borings were advanced by Boart Longyear of Fife, Washington, using a full-size sonic drill rig.

After the maximum depth was achieved in each sample interval, relatively undisturbed, discrete soil samples were collected from each soil boring at 5-foot intervals throughout the maximum depth explored. Soil samples were collected from the center of the core sample to avoid cross-contamination. The soil was classified using the Unified Soil Classification System. Soil characteristics, including moisture content, relative density, texture, and color, were recorded on boring logs, provided in Attachment A of the Draft Addendum—Supplemental Remedial Investigation Report (SoundEarth 2012e). The depths at which changes in soil lithology were observed and where groundwater was first encountered are also included on the boring logs. Selected portions of recovered soil core samples were placed in a plastic bag so the presence or absence of volatile organic compounds could be quantified using a PID. Soil samples were selected for analysis based on previous data, field indications of potential contamination, including visual and olfactory notations, PID readings, and/or the location of the sample proximate to the soil-groundwater interface.

After collection, soil samples were labeled with a unique sample ID, placed on ice in a cooler, and delivered to Friedman & Bruya, Inc. of Seattle, Washington, under standard chain-of-custody protocols for laboratory analysis. Select soil samples were submitted for laboratory analysis of CVOCs by EPA Method 8260C. In addition, samples exhibiting odor indicative of Stoddard solvents were analyzed for GRPH by NWTPH Method NWTPH-Gx and for BTEX by EPA Method 8260C. Laboratory analytical reports are provided in Attachment B of the Draft Addendum—Supplemental Remedial Investigation Report (SoundEarth 2012e).

2.10.2 Monitoring Well Installation

Borings B49 and B50 were completed as monitoring wells MW15 and MW16, respectively. Both monitoring wells were constructed of 2-inch-diameter blank PVC casing, flush-threaded to 0.010-inch slotted well screen. The bottom of each of the wells was fitted with a threaded PVC bottom cap, and the top of each well was fitted with a locking compression-fit well cap. The annulus of the monitoring wells was filled with #10/20 silica sand to a minimum height of 1 foot above the top of the screened interval. A bentonite seal with a minimum thickness of 1 foot was installed above the sand pack. The wells were completed at the surface with a flush-mounted, traffic-rated well box set in concrete. The well completion details are presented the boring logs, which are provided in Attachment A of the Draft Addendum—Supplemental Remedial Investigation Report (SoundEarth 2012e). Consistent with the other wells installed at the Site (with the exception of deep wells MW08, MW09, and MW12), wells MW15 and MW16 were constructed with 15 feet of screen set at approximately 5 feet above and 10 feet below the water table (as observed during drilling).

2.10.3 Monitoring Well Development

The monitoring wells were developed with the use of a Grundfos submersible pump. Monitoring well development consisted of surging and purging the wells until a minimum of 10 well volumes were removed and, with the exception of MW16, the groundwater no longer appeared turbid. Turbidity was measured visually by field personnel conducting development activities. Turbidity within MW16 could not be effectively reduced within the available timeframe; however, the well will be redeveloped prior to any subsequent sampling events.

2.10.4 Groundwater Monitoring

A groundwater monitoring event was conducted at the Site on December 10 and 21, 2012, and included the collection of depth-to-groundwater measurements from monitoring wells MW01 through MW07, MW10, MW11, and MW13 through MW16. Groundwater samples were collected from monitoring wells MW15 and MW16 in accordance with EPA's Low Flow (Minimal Drawdown) Ground-Water Sampling Procedures (April 1996) at least 24 hours following well development. During purging, water quality parameters that were monitored and recorded included temperature, pH, specific conductivity, dissolved oxygen, turbidity, and oxidation-reduction potential. Each well was purged until, at a minimum, pH, specific conductivity, and turbidity or dissolved oxygen stabilized. Samples were placed directly into clean, laboratory-prepared containers.

After collection, groundwater samples were labeled with a unique sample ID, placed on ice in a cooler, and delivered to Friedman & Bruya, Inc. under standard chain-of-custody protocols for laboratory analysis. Groundwater samples were submitted for laboratory analysis of CVOCs and BTEX by EPA Method 8260C (unpreserved sample containers were used for VC analyses), and GRPH by Method NWTPH-Gx.

2.10.5 Well Survey

Subsequent to completing well installation activities, on December 10, 2012, Triad Associates mobilized to the Site and surveyed the horizontal and vertical monitoring well locations and top of casing and monument elevations for the purposes of calculating groundwater flow gradient and direction. Elevations were surveyed relative to the North American Vertical Datum of 1988 (NAVD88) using City of Seattle Benchmark No. 36690702 as the source benchmark and incorporated into the previous survey conducted at the Site in October 2011.

2.10.6 Supplemental Remedial Investigation Results

Analytical results for soil and groundwater samples collected during the supplemental RI are presented on Figures 11 through 17 and in Tables 1 and 2. Laboratory analytical reports are provided in Attachment B of the Draft Addendum—Supplemental Remedial Investigation Report (SoundEarth 2012e).

2.10.6.1 Soil Results

Boring B49, which was advanced within the Terry Avenue North ROW, was completed to 56 feet bgs on December 5, 2012. Soil types encountered during drilling generally consisted of silty sand or interlayered silty sand and silt in the upper 27 feet. A prominent silt layer was noted at approximately 12 to 16 feet bgs. Sand was encountered from approximately 27 feet to 53 feet bgs. Gravelly sand was encountered from 53 feet bgs to 56 feet bgs. Moist to wet soil was encountered at approximately 42 feet bgs, and soil was saturated below approximately 51 feet bgs. None of the soil samples collected from boring B49 contained detectable concentrations of COCs.

Boring B50, which was advanced within the Thomas Street ROW, was completed to 106 feet bgs on December 7, 2012. Soil types encountered during drilling generally consisted of silty sand with interbedded layers of fine sand or medium sand. A prominent silt layer was noted at approximately 28 to 32 feet bgs. A moist but non-saturated sand unit with a strong petroleum/solvent odor with elevated PID readings (up to 588 parts per million by volume) was encountered at approximately 83 to 84 feet bgs, underlain by moist, silty sand that exhibited a moderate petroleum/solvent odor and elevated PID readings to approximately 87 feet bgs. Analytical results are presented in Table 1 and are summarized below and on Figures 11 through 17:

- Samples collected at 84 and 86 feet bgs (B50-84 and B50-86) contained concentrations of GRPH of 2,500 mg/kg and 170 mg/kg, respectively, which exceed the MTCA Method A cleanup level of 100 mg/kg.
- Samples collected at 84 and 86 feet bgs (B50-84 and B50-86) contained concentrations of PCE of 2.3 and 0.14 mg/kg, respectively, which exceed the MTCA Method A cleanup level of 0.05 mg/kg.
- The sample collected at a depth of 84 feet contained a concentration of TCE of 0.10 mg/kg that exceeded the MTCA Method A cleanup level of 0.03 mg/kg.
- Samples collected at depths of 6, 11, 81, and 91 feet bgs did not contain detectable concentrations of CVOCs or GRPH.

2.10.6.2 Groundwater Results

Groundwater elevations in the wells surveyed ranged from 15.28 feet (monitoring well MW13) to 18.01 feet (monitoring well MW15) NAVD88. Groundwater beneath the Site and vicinity was measured to flow generally toward the southeast, consistent with the data collected during the three previous monitoring events (Figures 8, 9, and 10). The groundwater elevation measured in MW15, which is located approximately 300 feet west of the Property, was 2 to 3 feet higher than the elevations measured on the Property. Monitoring wells MW13, MW03, and MW05 exhibited the lowest elevations measured at the Site (15.28, 15.44 and 15.50 feet NAVD88, respectively).

Table 2 presents the groundwater results, which are summarized below and on Figure 15:

- The sample collected from well MW15 contained a concentration of TCE of 7.2 µg/L, which exceeds the MTCA Method A cleanup level of 5 µg/L.
- No detectable concentrations of any of the remaining constituents were detected in the groundwater sample collected from MW15.
- Concentrations of VC (0.69 µg/L), cis-1,2-DCE (220 µg/L), TCE (12 µg/L), and PCE (16 µg/L) exceeded their respective MTCA Method A (and B, as applicable) cleanup levels in the groundwater sample collected from MW16.
- GRPH and total xylenes were detected at concentrations below their respective MTCA Method A cleanup levels in the sample collected from MW16.

2.11 PRELIMINARY CONCEPTUAL SITE MODEL

This section provides a conceptual understanding of the Site derived primarily from the results of the historical research and subsurface investigations performed at the Site. Included is a discussion of the confirmed and suspected source areas, the chemicals and media of concern, the fate and transport characteristics of the release of hazardous substances, the potential exposure pathways, and the definition of the Site. The CSM serves as the basis for developing technically feasible cleanup alternatives and selecting a final cleanup action. The CSM is considered to be dynamic and may be refined throughout the cleanup action process as additional information becomes available.

This section discusses the components of the CSM developed for the Site based on the completion of multiple phases of investigation conducted by SoundEarth and others. Figure 19 provides visual representations of the information presented below.

2.12 CONFIRMED AND SUSPECTED SOURCE AREAS

The following subsections provide a summary of the likely sources of the COCs identified during the RI and supplemental RI (SoundEarth 2012a and 2012e).

2.12.1 TCE in Groundwater

TCE was detected in groundwater samples collected from MW02, MW04, and MW15; however, unlike the contaminated groundwater identified in association with the Site, the TCE was not observed in conjunction with PCE or any of its degradation products, including cis-1,2-DCE and VC (Figure 20). The TCE detected in these three wells, located north and west of the Site, is not attributed to the Site for the following reasons:

- The wells are located hydrologically upgradient of the Site.
- Sources of TCE in groundwater are typically attributed to two scenarios: (1) as a pure TCE source, or (2) as a degradation product of PCE, in which case PCE and cis-1,2-DCE, at a minimum, would also be present (EPA 1998, Conrad 2012, McLoughlin 2012). No PCE or associated PCE degradation products other than TCE have been detected in samples collected from wells MW02, MW04, or MW15.
- Wells MW02, MW04, and MW15 exhibit relatively low concentrations of TCE in an aerobic subsurface environment; dissolved oxygen levels measured in these wells in December 2012 range from approximately 4 to 6 milligrams per liter (mg/L). The low concentrations of TCE can therefore only be attributed to reduction via dilution and not as a result of degradation (Conrad 2012). PCE cannot degrade in aerobic environments, and the degradation of TCE in aerobic environments tends to poison the microorganisms responsible for the degradation, invariably causing a stall in the degradation process (Stroo 2010). If PCE was the original source compound for the TCE identified upgradient of the Site, then it would also be present.
- If PCE was the original source of the TCE detected in these three wells, then cis-1,2-DCE also would be present. Anaerobic dechlorination can stall at cis-1,2-DCE, but has not ever been demonstrated to stall at TCE (e.g., Naval Facilities Engineering Command 2003, Cox et al. 2012). In addition, incomplete dechlorination would result in a buildup of degradation products (commonly referred to as “DCE stall”), none of which were detected in monitoring wells MW02, MW04, or MW15 (Figure 20).

Considering the significant differences between the contaminants identified on and upgradient of the Site, SoundEarth conducted a preliminary historical review of nearby and upgradient properties in an effort to identify potential sources of the TCE detected in wells MW02, MW04, and MW15. Although TCE is the most frequently detected groundwater contaminant in the United States as a result of its widespread use in industrial cleaning solutions and as a degreasing agent (EPA 1992, Fischer et al. 1987), it has primarily been used in both small- and large-scale industrial degreasing operations to clean metal parts (World Health Organization 2005, EPA 2012). Therefore, SoundEarth focused primarily on former or current manufacturers, metal works, and automotive repair facilities, all of which were common as part of the former industrial nature of the South Lake Union neighborhood. Based solely on a review of Sanborn Fire Insurance maps, at least 15 additional nearby (i.e., within 2 or 3 blocks) and/or upgradient facilities likely to use TCE in their regular operations were identified (Figure 21). Reviewing additional resources, including archived tax records, reverse city directories, and state and federal environmental databases, will likely identify several more potential sources of TCE in the area.

2.12.2 Chlorinated and Stoddard Solvents in Soil and Groundwater

The results of the investigations conducted at the Site suggest that the solvent impacts confirmed in soil and groundwater beneath the Property and portions of the adjoining ROWs are primarily the result of a release from the laundry and dry cleaning facility that operated on the Property from 1927 through 1985. Dry cleaners began using Stoddard solvents in 1928, and it was the predominant dry cleaning solvent used in the United States through the late 1950s (State Coalition for the Remediation of Drycleaners 2009). By 1962, however, PCE surpassed Stoddard solvents as the primary dry cleaning agent. At the time, 90 percent of PCE consumed in the United States was used for dry cleaning (Chemical Engineering News 1963). Considering the scale of the laundry and dry cleaning operations conducted at the Property, it is reasonable to expect that the use of dry cleaning solvents at the Property reflected that of the rest of the country.

Although the type and location of dry cleaning operations conducted on the Property prior to 1964 could not be confirmed, historical building plans indicated that the bulk of the dry cleaning operations after the mid-1960s were conducted on the southwest portion of the Property (Figure 3). Consistent with this information, the highest concentrations of chlorinated solvents are located near the center of the Property by the loading dock; the highest concentrations of Stoddard solvents were observed to the south of the three closed-in-place USTs inside the building. The distribution of solvents in soil and groundwater suggest that the primary source of the release is located in these two areas, although additional, smaller releases may have contributed to shallow solvent contamination elsewhere on the Property.

Naturally occurring biodegradation of PCE has been documented in the primary water-bearing zone beneath the Site. Biodegradation is confirmed through the presence of TCE, cis-1,2-DCE, and VC, each of which is a subsequent degradation product. Biodegradation through reductive dechlorination is facilitated by relatively low dissolved oxygen concentrations in the groundwater beneath the Site, ranging from approximately 0.5 to 3 mg/L.

The source(s) of the soil and groundwater contaminants detected in MW16, located in the Thomas Street ROW, has not been identified. Well MW16 is the only exploration completed to date that encountered a zone of contamination at an elevation of approximately 15 feet NAVD88 (Figure 17). Based on the land use history of the Property, the possibility exists that this soil contamination may result from an as-yet-unconfirmed release from the Property, in which case a release of solvents sank vertically through the soil. The solvents would continue to sink until they reached a preferential pathway (e.g., the sand lens identified in B50 at 84 feet) or until they hit groundwater. However, the laboratory analyses, review of Gas Chromatograph/Flame

Ionization Detector (GC/FID) traces, and a library search of tentatively identified compounds (TICs) indicated that the contamination identified in B50/MW16 may be a result of an off-Site source and/or commingling of multiple potential contaminant sources:

- When comparing GC/FID traces between groundwater collected from MW16 and the on-Property groundwater samples from B14 and MW06, neither B14 nor MW06 contain the chlorinated solvent-type material that elutes from mainly the n-C8 to n-C12 hydrocarbon fractions in MW16, suggesting that a different chemical than those identified on the Property may be impacting the groundwater within Thomas Street.
- When comparing the gasoline- and diesel-range detections in groundwater collected from B14, MW06, and MW16, the detections (flagged in the laboratory reports as not being indicative of diesel) in the groundwater collected from on-Property wells appear to be a result of a number of compounds that differ from the detection in Thomas Street, which is a complex mixture of thousands of compounds.
- When comparing the soil samples collected from B20 at 15 feet (located near the three closed-in-place USTs inside the building) and from B50 at 84 feet, each of which is impacted by a variety of chlorinated and hydrocarbon constituents, significant variations between the specific suite of compounds present were observed.

The TIC search for B20-15 identified 39 TICs with a subset of 8 TICs that have a Q value of 85 or higher1. Within the subset, the 3 TICs found at the highest concentration are 2,6-dimethylnonane, undecane, and cis-octahydro-indene.

- The TIC search for B50-84 identified 24 TICs with a subset of 13 TICs that have a Q value of 85 or higher. Within the subset, the 3 TICs found at the highest concentration are 1-ethyl-2-methyl benzene, octohydro-2-methyl pentalene, and 1,2-diethylbenzene.
- Only 1 of the TICs with a qualifier greater than 85 and identified in B50-84 was also identified in the TIC results for B20-15. If qualifiers are ignored, comparison between the samples identifies 5 out of 24 TICs present in B50-84 that are also present in B20-15. This level of correlation is poor (Friedman & Bruya, Inc. 2012).
- Upon cursory review by the laboratory, the substantial variability in both the suite and relative abundance of the chlorinated and hydrocarbon constituents between the samples reviewed do not appear to be solely attributable to weathering considerations and instead indicate that either multiple sources or one highly variable source has impacted these locations. Further testing would be required to identify the currently unknown source of the contamination in B50 at 84 feet (Friedman & Bruya, Inc. 2012).

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[1] A tentatively identified compound (TIC) is any non-surrogate organic compound that is not included in the target compound list analyzed for via EPA Method 8260 but that is tentatively identified via a forward search of the NIST/EPA/NIH mass spectral library (i.e., a library search). If the “Q” value of the search is greater than or equal to 80%, the compound will be reported as a TIC. (Scientific Engineering Response and Analytical Services, *Standard Operating Procedures, Volatile Organic Compound Analysis by GC/MS [EPA/SW-846 Method 8000B and 8260B] 2006).*

Based on the laboratory review of the above data, it appears probable that multiple releases have impacted the Site. Although the Property is the only facility in the immediate vicinity with a confirmed or reported release of chlorinated solvents and petroleum hydrocarbons to the subsurface, it is possible that other nearby sources exist. The most likely alternative source for the contamination within the Thomas Street ROW is the Seattle Times facility. The Seattle Times facility includes a 1930-vintage, four-story plant building; two 1968-vintage, three- and four-story office buildings with 1978-vintage building additions; and a 1948-vintage, one-story garage and automotive repair building that faces Thomas Street. Potential sources of contamination resulting from the operation of the Seattle Times are discussed in the Draft RI Report (SoundEarth 2012a) and include the following:

- The 1930-vintage structure included a basement and sub-basement, paper warehouse with rooftop parking, a press room, and a linotyping/printing/engraving area.
- Between 1948 and 1957, three USTs with capacities of 550, 1,000, and 3,000 gallons were installed between the existing repair garage and the original Seattle Times Building. Fuel delivery lines connected these USTs to a fuel-dispensing pump island located inside the garage.
- In 1964, two concrete-walled ink tanks lined with galvanized steel were installed within the basement of the Seattle Times Building in the approximate center of the property. A gasoline UST with an unknown capacity was also installed on the property during this time.
- In 1974, three 12,000-gallon USTs were installed on the property: two gasoline USTs and one diesel UST (which remain operational) were installed between the Seattle Times Building and garage along Thomas Street. The side sewer was rerouted because of the proposed location of the USTs, and the 550-gallon UST was converted to a waste oil UST. The third 12,000-gallon UST contained heating oil and was located in the southwest portion of the property beneath the parking lot outside of press room building along John Street.
- In 1978, one of the 1964-vintage concrete ink tanks underwent repairs to the damaged containment walls.
- In 1981, the 1964-vintage ink tanks were abandoned and a new aboveground ink tank system was installed in the southern portion of the garage addition. The system was comprised of two 10,000-gallon and five 500-gallon ASTs, a recycled ink AST, and a used ink AST.
- According to Ecology records, a 550-gallon waste oil UST was installed beneath the property in 1986 and an 8,000-gallon gasoline UST replaced the 3,000-gallon UST in 1989.
- In 1990, a flammable storage area was constructed on the property to the south of the garage. The storage area included drum storage, mixing, and plate cleaning rooms on the first floor, and a kerosene AST room on the ground floor.

2.12.3 CHEMICALS OF CONCERN

Based on the findings of the RI, the primary COCs at the Site are PCE and TCE (a natural degradation product of PCE) located beneath the western half of the Property and portions of the Boren Avenue North and Thomas Street ROWs. Although an elevated concentration of TCE (5.2 µg/L) was detected in groundwater collected from monitoring well MW02 in Harrison Street in May 2011, the concentration in groundwater has since dropped below the cleanup level.

Secondary COCs identified for the Site include cis-1,2-DCE, VC, GRPH (as Stoddard solvents), DRPH, ORPH, and associated compounds located beneath the Property.

2.12.4 MEDIA OF CONCERN

Soil, soil vapor, and groundwater have been confirmed as affected media at the Site. Indoor air has been retained as potential media of concern based on the elevated concentrations of PCE in soil and groundwater beneath the Site.

2.12.5 PRELIMINARY CONCEPTUAL SITE MODEL SUMMARY

A summary of the geologic, hydrogeologic, and laboratory analytical data are presented on Figure 19, which display a conceptual model of Site conditions. As shown on Figures 6 and 7, the stratigraphy at the Site is distinguished by three distinct geologic units (Vashon recessional outwash deposits [Qi], ice-contact deposits [Qvr], and pre-Fraser nonglacial deposits [Qpfa]). In addition, a discontinuous perched groundwater interval occupies portions of the center of the Site, and the primary water-bearing zone is present beneath the Site at elevations of approximately 15 to 18 feet above NAVD88.

The soil analytical data collected during the investigations conducted at the Site indicate that GRPH as Stoddard solvents and chlorinated solvent concentrations were highest in the center of the Property near the loading dock, which is the probable source area. A second zone of soil containing high concentrations of PCE and Stoddard solvents was observed at depths between 84 and 86 feet during the installation of B50/MW16 within the Thomas Street ROW. The source for this second zone of contamination remains unknown.

The high concentrations of PCE in soil and perched groundwater in the vadose zone are inferred to be evidence of a release from the former dry cleaning facility that operated on the Property. Concentrations of COCs in the soil decrease rapidly—both horizontally and vertically—with distance from the source area. Beyond the high source area concentrations, which are limited vertically by a dense silt layer that appears to have restricted vertical contaminant migration, the vertical and lateral distribution of PCE concentrations is relatively consistent throughout the southwestern portion of the Property. The widespread extent of PCE in soil exhibiting relatively low concentrations is indicative of a long-term release via vapor-phase diffusion. The soil contamination appears to be limited to within the Property boundaries.

Impacts to groundwater within the primary water-bearing zone as a result of the release from the Troy Laundry property extend approximately 390 north-south and up to 240 feet east-west, generally trending west-southwest from the source area. Concentrations of chlorinated solvents within the groundwater are relatively low; the highest on-Property concentration of PCE in groundwater (21 µg/L) was collected from MW11, which was installed near the source area. Groundwater collected from the two impacted deep wells (MW09 and MW12) did not contain detectable concentrations of PCE, which is consistent with the peripheral degradation of chlorinated solvents within the primary water-bearing zone.

Data collected from wells north of the Property confirm that no risks to surface water or sediment exist as a result of the release at the Property, and that ongoing risks to human health and the environment as a result of vapor intrusion will be mitigated following excavation of the source area, as discussed in the proceeding sections. The evaluation of the vertical distribution of contamination in groundwater was conducted by sampling the former supply well on the Property, which was installed to a depth of approximately 498 feet bgs. The results of sampling conducted at the well demonstrated that the deeper aquifer beneath the Site has not been impacted by a release from the former property operations.

In summary, the following exposure pathways are of concern for future human health exposure at the Site:

- **Soil Pathway.** Direct contact via dermal contact and/or ingestion by construction workers encountering contaminated soil during future construction activities on the Site. However, the soil pathway is not considered complete under the planned future use of the Property. Additional discussion of soil pathways is included in Section 6.6.1 of the RI Report (SoundEarth 2012a).
- **Groundwater Pathway.** Direct contact via dermal contact and/or ingestion by construction workers encountering contaminated perched groundwater during future construction activities on the Site. Human health exposure via ingestion of groundwater as a potable drinking water supply is not considered to be a complete exposure pathway. Additional discussion of groundwater pathways is included in Section 6.6.2 of the RI Report (SoundEarth 2012a).
- **Vapor Pathway.** A screening level VI evaluation suggests that there is the potential for an unacceptable VI risk from contaminants in soil and/or groundwater intruding into existing structures at the Site, as well as short-term inhalation of volatilized contaminants by construction workers during future construction activities on the Site. However, the VI pathway is not considered complete under the planned future use of the Property. Additional discussion of the vapor pathway is included in Section 6.6.3 of the RI Report (SoundEarth 2012a).

3.0 TECHNICAL ELEMENTS

RAOs were used to define the technical elements evaluated to select a remedial alternative. The technical elements include ARARs, COCs, media of concern, and cleanup standards.

3.1 REMEDIAL ACTION OBJECTIVES

RAOs are statements of the goals that a remedial alternative should achieve in order to be retained for further consideration as part of the FS. The purpose of establishing RAOs for a site is to provide remedial alternatives that protect human health and the environment (WAC 173-340-350). In addition, RAOs are designated in order to:

- Implement administrative principles for cleanup (WAC 173-340-130).

- Meet the requirements, procedures, and expectations for conducting an FS and developing cleanup action alternatives as discussed in WAC 173-340-350 through 173-340-370.
- Develop cleanup levels (WAC 173-340-700 through 173-340-760) and remedial alternatives that are protective of human health and the environment.

In particular, RAOs must address the following threshold requirements from WAC 173-340:

- Protect human health and the environment.
- Comply with cleanup levels.
- Comply with applicable state and federal laws.
- Provide for compliance monitoring.

The overall RAO is to treat the primary source area and reduce COC concentrations in soil and groundwater to below the applicable cleanup levels at the points of compliance proposed in Section 3.4.2. In addition to mitigating risks to human health and the environment, achieving the RAO ultimately will allow Ecology to issue a Covenant Not to Sue for the Site.

In consideration of the anticipated future use of the Property, specific objectives for the preferred remedy include the following:

- Excavate on-Property soil containing PCE and other COCs at concentrations that present a risk to human health and the environment.
- Use in situ treatment methods to reduce COCs in groundwater to avoid conflicts with future planned land use.
- Prevent further off-Property migration of COCs in groundwater at concentrations exceeding cleanup levels.
- Provide engineering controls to prevent the unacceptable risks to human health posed by COCs in groundwater until cleanup levels are achieved.
- Acquiring phased approval of interim actions conducted at the Site.
- To facilitate a Consent Decree at the Site, including a Covenant Not to Sue and contribution protection.

3.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Under WAC 173-340-350 and 173-340-710, ARARs include regulatory cleanup standards, standards of control, and other environmental requirements, criteria, or limitations established under state or federal law that specifically address a contaminant, remedial action, location, or other circumstances at a site.

MTCA defines relevant and appropriate requirements as:

> Those cleanup action standards, standards of control, and other human health and environmental requirements, criteria or limitations established under state and federal law that, while not legally applicable to the hazardous substance, cleanup action, location, or other circumstances at a site, the department determines address problems or situations sufficiently

> similar to those encountered at the site that their use is well suited to the particular site. The criteria specified in WAC 173-340-710(3) shall be used to determine if a requirement is relevant and appropriate.

Remedial actions conducted under MTCA must comply with the substantive requirements of the ARARs but are exempt from their procedural requirements (WAC 173-340-710[9]). Specifically, this exemption applies to state and local permitting requirements under the Washington State Water Pollution Control Act, Solid Waste Management Act, Hazardous Waste Management Act, Clean Air Act, State Fisheries Code, and Shoreline Management Act.

ARARs were screened to assess their applicability to the Site. The following table summarizes the preliminary ARARs.

PRELIMINARY ARARs FOR THE SITE

Preliminary ARAR	Citation or Source
MTCA	Chapter 70.105 of the Revised Code of Washington (RCW)
MTCA Cleanup Regulation	Washington Administrative Code (WAC 173-340)
Ecology, Toxics Cleanup Program – Guidance To Be Considered	*Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, Review DRAFT, October 2009, Publication No. 09-09-047
State Environmental Policy Act	RCW 43.21C
Washington State Shoreline Management Act	RCW 90.58; WAC 173-18, 173-22, and 173-27
The Clean Water Act	33 United States Code (USC) 1251 et seq.
Comprehensive Environmental Response, Compensation, and Liability Act of 1980	42 USC 9601 et seq. and 40 CFR 300
The Fish and Wildlife Coordination Act	16 USC 661-667e; the Act of March 10, 1934; Ch. 55; 48 Stat. 401
Endangered Species Act	16 USC 1531 et seq.; 50 CFR 17, 225, and 402
Native American Graves Protection and Repatriation Act	25 USC 3001 through 3013; 43 CFR 10 and Washington's Indian Graves and Records Law (RCW 27.44)
Archaeological Resources Protection Act	16 USC 470aa et seq.; 43 CFR 7
Washington Dangerous Waste Regulations	WAC 173-303
Solid Waste Management Act	RCW 70.95; WAC 173-304 and 173-351
Occupational Safety and Health Administration Regulations	29 CFR 1910, 1926
Washington Department of Labor and Industries Regulations	WAC 296
Water Quality Standards for Surface Waters of the State of Washington	RCW 90.48 and 90.54; WAC 173-201A
Water Quality Standards for Ground Water	WAC 173-200

Preliminary ARAR	Citation or Source
Department of Transportation Hazardous Materials Regulations	40 CFR 100 through 185
Washington State Water Well Construction Act	RCW 18.104; WAC 173-160
City of Seattle regulations, codes, and standards	All applicable or relevant and appropriate regulations, codes, and standards
King County regulations, codes, and standards	All applicable or relevant and appropriate regulations, codes, and standards

3.3 MEDIA AND CHEMICALS OF CONCERN

The Site development plan involves excavating to elevations between approximately 18 and 38 feet above NAVD88 for multilevel subgrade parking. The depth of the planned excavation is expected to incorporate all soil that exhibits COC concentrations exceeding applicable cleanup levels. The soil will be transported off the Site for disposal at an appropriate land disposal site. Although soil is currently the primary media of concern, upon the excavation and removal of the contaminated soil, groundwater will become the primary media of concern. Secondary media of concern include soil vapor and indoor air by virtue of vapor transport from groundwater. The primary and secondary media and associated COCs are shown in the table below.

Media of Concern	Chemicals of Concern
Soil	PCE, TCE, and GRPH (Stoddard Solvent constituents)
Groundwater	PCE; TCE; cis-1,2-DCE; VC; and GRPH (Stoddard Solvent constituents)
Soil Vapor, Indoor Air	PCE; TCE; cis-1,2-DCE; VC; and GRPH (Stoddard Solvent constituents)

3.4 CLEANUP STANDARDS

Although the interim action described herein has been developed to remediate the portions of the Site that have been confirmed to be impacted as a result of the release at the Property, the interim action also has been developed to be consistent with the requirements of a cleanup action (WAC 173-340-360 through 400) to the extent possible. Therefore, the selected cleanup alternatives must comply with the MTCA cleanup regulations specified in WAC 173-340 and with applicable state and federal laws. The cleanup levels selected for the Site are consistent with the RAOs, which state that the remedial objective is to reduce concentrations of COCs in soil and/or groundwater to below the MTCA Method A (or B, as applicable) cleanup levels in order to mitigate risks to human health and the environment. The associated media-specific cleanup levels for the identified COCs are summarized in Sections 3.4.1 and 3.4.2 below.

3.4.1 Cleanup Levels

The cleanup levels for the media and COCs are tabulated below, including the source of the standard. The proposed cleanup levels for the Site are the MTCA Method B cleanup levels for PCE and TCE in soil, which are protective of the direct-contact pathway, and the MTCA Method A cleanup levels for GRPH in soil. The MTCA Method A cleanup levels are proposed for COCs in groundwater. If no promulgated MTCA Method A cleanup level exists for a given chemical or medium, the proposed cleanup level is the MTCA Method B Standard Formula Value for carcinogenic or noncarcinogenic compounds, depending upon the carcinogenic properties of the compound.

Proposed Cleanup Levels for Soil

COC	Cleanup Level (mg/kg)	Source
PCE	1.9	MTCA Method B Calculation; WAC 173-340-740 (3)(b)(iii)(B)(II) Equation 740-2
TCE	11	MTCA Method B Calculation; WAC 173-340-740(3)(b)(iii)(B)(II) Equation 740-2
GRPH	100	MTCA Method A, Unrestricted; WAC 173-340-740(2)(b)(i)

Proposed Cleanup Levels for Groundwater

COC	Cleanup Level (µg/L)	Source
GRPH	1,000	MTCA Method A, Table Value; WAC 173-340-720(3)(b)(i)
PCE	5	MTCA Method A, Table Value; WAC 173-340-720(3)(b)(i)
TCE	5	MTCA Method A, Table Value; WAC 173-340-720(3)(b)(i)
Cis-1,2-DCE	16	MTCA Method B, Standard Formula; WAC 173-340-720(4)(b)(iii)(A) (noncarcinogenic)
VC	0.2	MTCA Method A, Table Value; WAC 173-340-720(3)(b)(i)

Proposed Cleanup Levels for Soil Gas

COC	Cleanup Level[1] (µg/m^3)	Source
GRPH[2]	1,400/14,000	"Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action", Review DRAFT, October 2009, Publication No. 09-09-047; Appendix B, Method B
PCE	4.2/42	
TCE	1/10	
Cis-1,2-DCE	160/1,600 (NC)	
VC	2.8/28	

NOTES:

[1] The first value is the screening level for sub-slab measurements; the second value is the screening level for deep (> 15 feet below ground surface) soil gas measurements.

[2] This is the lowest (most conservative) of the three screening level values for air-phase petroleum hydrocarbon fractions.

µg/m^3 = micrograms per cubic meter
NC = noncarcinogenic

Proposed Cleanup Levels for Indoor Air

COC	Cleanup Level ($\mu g/m^3$)	Source
GRPH[1] PCE TCE Cis-1,2-DCE VC	140 0.42 0.1 16 (NC) 0.28	*Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, Review DRAFT, October 2009, Publication No. 09-09-047; Appendix B, Method B

NOTES:

[1] This is the lowest of the three screening level values for air-phase petroleum hydrocarbon fractions.

NC = noncarcinogenic

3.4.2 Points of Compliance

The point of compliance is the location where the enforcement limits that are set in accordance with WAC 173-200-050 will be measured and cannot be exceeded (WAC 173-200-060). Once the cleanup levels have been attained at the defined points of compliance, the impacts present beneath the Property will no longer be considered a threat to human health or the environment. In situations where achieving the standard point of compliance is not practicable, conditional points of compliance can be implemented under the expectation that the persons responsible for undertaking the cleanup action shall demonstrate that all practical methods of treatment will be used in the Site cleanup (WAC 134-340-720[8][c]).

3.4.2.1 Point of Compliance for Groundwater

In accordance with WAC 173-340-720(8)(a)(b), the point of compliance for groundwater is defined as the uppermost level of the saturated zone extending vertically to the lowest depth that potentially could be impacted by the COCs throughout the Site. Groundwater cleanup levels shall be attained in all groundwater from the point of compliance to the outer boundary of the hazardous substance plume.

3.4.2.2 Point of Compliance for Soil

In accordance with WAC 173-340-740(6)(b-d), the point of compliance for direct contact exposure is throughout the Property from the ground surface to 15 feet bgs, which is a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of development activities. All soil containing concentrations of COCs above the direct-contact threshold will be overexcavated and removed from the Site.

In order to be protective of groundwater, all on-Property soil containing known concentrations of PCE above the cleanup level of 0.05 mg/kg (Table 740-1 of WAC 173-340) will be overexcavated. Contaminated soil will be disposed of at a permitted facility in accordance with a contained-in determination issued by Ecology.

3.4.2.3 Point of Compliance for Soil Gas

Cleanup standards and points of compliance for soil gas have not been promulgated as of the date of this document, although soil gas screening levels have been published as draft guidance by Ecology (Ecology 2009b) and are included as ARARs for this document. The points of compliance for soil gas are identified in the referenced guidance for both sub-slab gas (soil gas encountered just beneath a building) and deeper soil gas (defined as equal to, or greater than, 15 feet bgs).

3.4.2.4 Point of Compliance for Indoor Air

Cleanup standards and points of compliance for indoor air have not been promulgated as of the date of this document, although indoor air cleanup levels have been published as draft guidance (Ecology 2009b) and are included as ARARs for this document. The points of compliance will be the standard point of compliance per WAC 173-340-750(6), which is ambient air throughout the Property.

4.0 INTERIM ACTION

The following sections (1) summarize the feasible remedial alternatives that were developed for the Property and the portions of the adjoining Boren Avenue North and Thomas Street ROWs affected by the release from the Property, and (2) outline the components associated with the selected interim action activities.

4.1 EVALUATION OF FEASIBLE REMEDIATION TECHNOLOGIES

Remedial components (technologies) were evaluated in the FS with respect to the degree to which they comply with the cleanup requirements set forth in MTCA. According to MTCA, a cleanup alternative must satisfy all of the following threshold criteria as specified in WAC 173-340-360(2):

- Protect human health and the environment.
- Comply with cleanup standards.
- Comply with applicable state and federal laws.
- Provide for compliance monitoring.

These criteria represent the minimum standards for an acceptable cleanup action.

WAC 173 340-360(2)(b) also requires the cleanup action alternative to:

- Use permanent solutions to the maximum extent practicable.
- Provide for a reasonable restoration time frame.
- Consider public concerns on the proposed cleanup action alternative.

Using the above criteria, several remedial technologies were evaluated and screened for effectiveness, implementability, and relative cost to produce a short list for further inclusion in the development of alternatives. Table 3 of the Draft Feasibility Study Report (FS Report) (SoundEarth 2012b) summarizes the remedial component screening process. The remedial components that passed the screening process and will be implemented during the interim action are summarized in the following subsections.

4.1.1 Excavation and Land Disposal of Contaminated Soil (Source Removal)

Essentially the entire Property will be excavated from lot-line to lot-line, as discussed in greater detail below. For the purposes of this IAP, the portions of the Property with soil containing concentrations of COCs in excess of their respective cleanup levels will be referred to as the

Remedial Excavation Area. The Remedial Excavation Area is defined as the vertical and horizontal limit of the soil exhibiting contamination above cleanup levels within the Property boundary (Figures 22 through 25). In addition, because the interim action will be conducted as part of a larger redevelopment project, all buildings on the Property will be demolished prior to beginning shoring and excavation. The excavation of contaminated soil from the Property is anticipated to result in the complete removal of the ongoing source of COCs to the groundwater (Figures 22 through 25). Land disposal is the act of removing contaminated soil from an uncontrolled condition and placing it in a controlled condition where it will produce fewer adverse environmental impacts. A controlled condition generally refers to engineered landfills that feature low permeability liners, witness systems, and leachate collection systems to prevent the disposed soil from leaching into the environment and mitigate future liability associated with the contamination. The costs for each alternative include the removal and disposal of all soil within the Remedial Excavation Area to an approximate elevation of 19 feet above NAVD88 (Figures 22 through 25). Although cleanup levels protective of direct contact are proposed for soil across the Site, on-Property soil containing known concentrations of PCE above the MTCA Method A cleanup level will be overexcavated in an effort to remove the ongoing source of contamination to groundwater and provide a reasonable restoration time frame.

The Remedial Excavation Area covers approximately 1 acre of land. Assuming an excavation elevation of 19 feet above NAVD88, the volume of soil within the Remedial Excavation Area would be approximately 97,540 tons. Based on soil analytical data collected through the RI phase of work, approximately 340 tons of soil would require land disposal as dangerous waste classified as EPA Waste Code F002. The actual amount of material requiring disposal as land-ban or dangerous waste would ultimately be based on additional soil confirmational sampling conducted prior to and during excavation. The balance of the excavated material (approximately 97,200 tons) would be managed as nondangerous waste under a contained-in determination and contingent management option as determined by Ecology. Soil would be excavated within the confines of the shoring as designed by the civil engineer and would be directly loaded into trucks for off-Property treatment and land disposal in accordance with the contained-in determination issued by Ecology.

4.1.2 Dewatering during Excavation (Source Removal)

Dewatering is the process of pumping the localized, shallow perched groundwater prior to excavating through the dense silt layer, which will prevent contamination of underlying soil by eliminating the potential for soil contact with contaminated perched groundwater. As the excavation proceeds, the discontinuous but contaminated perched groundwater that was observed near the center of the Property may be encountered. The perched groundwater appears to be associated with a small vegetated slope that facilitates localized recharge (Figure 19). The excavation will be coordinated to first address the contaminated soil near the center of the source area in an effort to segregate the dangerous waste and remove the contaminated perched water prior to excavating through the dense silt layer.

4.1.3 Soil Vapor Extraction

SVE is the process of inducing an air pressure and concentration gradient in the subsurface to cause volatile compounds, including PCE, TCE, and GRPH, to desorb from the soil and flow with the vapor stream to a common collection point for discharge or treatment. As discussed in preceding sections of this IAP, SVE was previously applied at the Site in an effort to reduce concentrations of PCE to below dangerous waste criteria prior to excavation and land disposal.

Soil contamination was observed at an interval of 84 to 86 feet bgs during the installation of B50/MW16. If the contaminated soil identified in the Thomas Street ROW resulted from a release at the Property, an SVE system will be installed along the southern Property boundary to address the contaminated soil. The SVE system will be designed to target this zone of contaminated soil by applying a vacuum via horizontal wells that would extend beneath the Thomas Street ROW to induce the flow of air and enhance the recovery of VOCs from the soil. The vacuum pressure created by the blower draws air from the vadose zone into the well casing. The extracted vapor would travel back to the remediation compound through the subsurface piping. The recovered vapors from the system would be monitored to assess the effectiveness of the remediation system and mass recovery. The lateral extent of the system would be based upon the width of the contaminated soil zone. The full lateral extent of both the contaminated soil and the associated remediation system is anticipated to be identified immediately prior to or during on-Property contaminated soil excavation activities.

4.1.4 Reductive Dechlorination (Anaerobic Bioremediation)

Reductive dechlorination is a proven remedial technology for addressing chlorinated solvents in groundwater and is a biotic process completed by anaerobic bacteria. The fermentation of edible oil by indigenous microorganisms injected into the groundwater produces a rapid and significant reduction in dissolved oxygen concentrations in the saturated zone. This provides the strongly negative oxidation/reduction potential necessary to treat the target COCs by reductive dechlorination. Complete dechlorination of PCE produces nontoxic chloride and carbon dioxide.

The anaerobic zone extends far beyond the radius of influence of the edible oil itself, enhances attenuation of contaminants both upgradient and crossgradient of the active treatment zone, and serves as a barrier around the periphery of the treatment system/groundwater plume, thereby preventing recontamination of groundwater beneath the Property and adjoining ROWs.

4.1.5 Passive Vapor Barrier

Passive vapor barriers exhibit very low vapor flow permeability and can prevent the intrusion of vapor-phase VOCs into the interior of the building. The removal of all soil contamination via excavation, the substantial thickness of the proposed foundation, as well as the belowground parking structure and venting system, would mitigate the potential for intrusion and/or collection of unsafe levels of COC vapors into the parking garage and above-grade building. The foundation of the future development will include the floor and walls of a multilevel, belowground parking garage. The foundation will be comprised of several feet of concrete, which would form a permanent vapor barrier to contaminant migration.

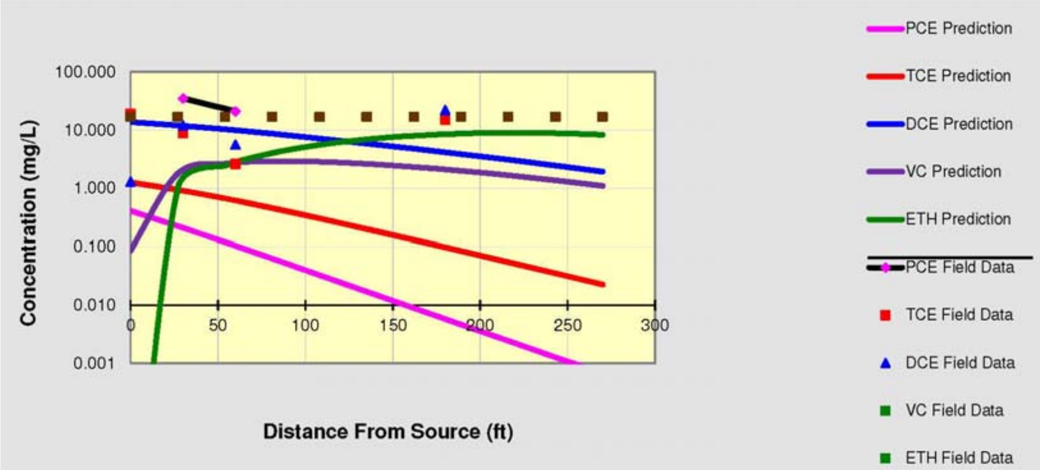
4.1.6 Monitored Natural Attenuation

Monitored natural attenuation refers to the methods used to evaluate whether natural attenuation processes are effectively remediating a contaminant plume, and if so, at what rate. Contaminants released to the environment in concentrations that pose risks to human health or the environment are subject to natural degradation processes such as volatilization, diffusion, biotic and abiotic reactions, and dilution. These naturally occurring attenuation processes are distinguished from an engineered remedy employed to increase the rate of remediation above the rate observed through these "natural" processes. In many cases, natural attenuation is the most cost effective means for achieving cleanup levels.

Monitored natural attenuation is retained as a complimentary remedial component to other engineered remedial components rather than as a stand-alone or sole remedial component to be consistent with the expectations for natural attenuation stipulated under MTCA. Under MTCA, monitored natural attenuation can be considered an active remedial measure if site conditions conform to the expectations listed in WAC 173-340-370(7), as follows:

- Source control (including removal and/or treatment of hazardous substances) has been conducted to the maximum extent practicable.
- Leaving contaminants in place during the restoration time frame does not pose an unacceptable threat to human health or the environment.
- There is evidence that natural biodegradation or chemical degradation is occurring and will continue to occur at a reasonable rate at the site.
- Appropriate monitoring requirements are conducted to ensure that the natural attenuation process is taking place and that human health and the environment are protected.

While the active groundwater treatment area was designed to include the worst-case, maximum extent of the plume, natural attenuation would effectively address any residual contamination located beyond and within the proposed conditional points of compliance. To evaluate the long-term impacts on chlorinated solvent concentrations assuming no active groundwater remediation, the Site-specific data was entered into the BIOCHLOR model, a copy of which is provided in Appendix A of the FS Report (SoundEarth 2012b). Because the model output, which assumes a decaying single planar source, suggests that natural attenuation will occur over a longer period of time (25 years), it is reasonable to expect that, following complete source removal and groundwater treatment, PCE and TCE concentrations will decrease more rapidly than the modeling estimate.



Graph 1. BIOCHLOR Model of natural attenuation of chlorinated solvents at the Site after 25 years. Model assumptions require an ongoing source; however, because the source will be excavated and removed from the Site, it is reasonable to anticipate a more rapid degradation rate than modeled, with or without treatment.

Concentrations of 1,2-cis-DCE and VC would be expected to increase slightly, but not to the magnitude predicted by the model because the source area (contaminated soil) would be removed. However, the zone where natural attenuation will, if necessary, supplement active groundwater treatment is upgradient and crossgradient of the treatment area (south and west of the proposed conditional points of compliance), and any generated cis-1,2-dichloroethylene and VC would ultimately be consumed within the anaerobic dechlorination zone.

4.1.7 Shoring

Shoring is required to protect the safety of personnel working in the excavation, as well as the surrounding properties, from damage due to slope failure. For the purpose of estimating the remedial cost for each alternative, it is assumed that shoring is a development-related cost and is therefore not included in the cost estimates provided in the FS Report (SoundEarth 2012b).

For illustration purposes, it is anticipated that the shoring would be installed around the entire perimeter of the redevelopment. Footing drains would be completed along the exterior perimeter of the foundation to collect any groundwater that may come into contact with the structure; however, considering the anticipated depth of the shoring and excavation project (approximately 50 to 85 feet bgs northwest to southeast, or a maximum of 18 feet above NAVD88) and the primary water-bearing zone relative to the depth of the excavation (approximately 2 feet below the final grade), any groundwater collected at the footing drains would likely be limited in volume.

4.2 INTERIM ACTION OBJECTIVES

As discussed above, the objectives of the interim action for the Site have been established in consideration of the future redevelopment and land use of the Property and include the following:

- Excavate on-Property soil containing PCE and other COCs at concentrations that present a risk to human health and the environment.
- Apply in situ treatment methods to reduce COCs in groundwater during redevelopment to take advantage of the efficiencies available during ongoing excavation activities and to avoid conflicts with future planned land use.
- Prevent further off-Property migration of COCs at concentrations exceeding cleanup levels.
- Provide engineering controls to prevent the unacceptable risks to human health posed by COCs in groundwater until cleanup levels are achieved.
- Acquire phased completion letters from Ecology indicating the successful implementation of the interim action.
- To facilitate a Consent Decree at the Site, including a Covenant Not to Sue and contribution protection.

5.0 INTERIM ACTION IMPLEMENTATION PLAN

This section provides a description of the interim action components that will be implemented in order to remediate soil and groundwater beneath the Site containing concentrations of COCs exceeding the cleanup levels.

5.1 INTERIM ACTION IMPLEMENTATION DOCUMENTS

A detailed Sampling and Analysis Plan (SAP) and Health and Safety Plan (HASP) were prepared as part of the IAP and are appended to this report. The purpose of the SAP is to ensure that the sample collection, handling, and analysis conducted after completion of the interim action will result in data that meet the data quality objectives for the interim action at the Site. The SAP includes requirements for sampling activities, including sampling frequency and location, analytical testing, documentation, and quality assurance/quality control for compliance monitoring. The SAP also defines the data quality objectives and standard operating procedures for the interim action, as well as includes details regarding sample collection and analysis, including sample collection procedures, analytical methods, quality assurance/quality control procedures, and data quality reviews (Appendix A).

The purpose of the HASP is to outline the Site-specific health and safety requirements for the interim action. The HASP will include guidelines to reduce the potential for injury during implementation of the interim action, as well as incident preparedness and response procedures, emergency response and evacuation procedures, local and project emergency contact information, appropriate precautions for potential airborne contaminants and Site hazards, and expected characteristics of the waste generated by the proposed work (Appendix B).

5.2 CONSTRUCTION ACTIVITY SUMMARY—EXCAVATION AND LAND DISPOSAL OF CONTAMINATED SOIL

The following sections summarize the construction activities and procedures included in the interim action. The excavation contractor will mobilize to the Property and set up operational areas necessary to implement the interim action. The limits of the remedial excavation are depicted on Figures 22 through 26J, and Site work will generally proceed as described in the following sections.

5.2.1 Site Preparation and Mobilization

Prior to initiating construction activities, temporary erosion and sediment control (TESC) measures will be established as part of the larger construction excavation project. Once all TESC measures are implemented in accordance with the construction project plan, construction equipment and supplies will be mobilized to the Site.

5.2.2 Well Decommissioning

Monitoring wells within the footprint of the excavation area, including MW06 and MW08 through MW12, will be decommissioned by a licensed well driller or under the supervision of a professional engineer in accordance with the Ecology Water Well Construction Act (1971), RCW 18.104 (WAC 173-160-460). The wells will be decommissioned in place using bentonite clay.

5.2.3 Shoring Installation

Shoring will be installed around the entire perimeter of the redevelopment and will consist of soldier piles, lagging, and tie backs. The shoring design will be incorporated into the future development plans and are not presented in this draft IAP. Shoring will be installed in 5- to 10-foot increments as the excavation proceeds to facilitate the safe excavation of contaminated soil to the required depth. The shoring installation will proceed in a clockwise manner around the perimeter of the Property.

5.2.4 Shoring and Excavation Sequence

The interim action involves excavating contaminated soil within the Remedial Excavation Area and transporting the excavated material off the site for land disposal. The bulk excavation will commence after the completion of the following items:

- Acquiring a contained-in determination and profiling for waste disposal from Ecology.
- Installing TESC measures.
- Establishing site security and fencing.
- Demolishing existing buildings.
- Preparing ingress and egress pathways.
- Decommissioning monitoring wells within the Remedial Excavation Area.
- Installing the shoring system.
- Setting up a storage tank to contain groundwater removed from the shallow perched area, surface water runoff/infiltration, and construction dewatering for off-site treatment and disposal.

Existing soil analytical data would be used to direct the real-time segregation and loading of haul trucks based on the following categories:

- **Dangerous Waste Soil Suitable for Land Disposal.** Soil exhibiting PCE concentrations greater than 1.9 mg/kg but less than 60 mg/kg is designated as dangerous waste that is suitable for land disposal in an approved RCRA Subtitle C facility without further treatment. The 1.9 mg/kg value is considered protective of the direct contact pathway (Appendix B of the FS Report, SoundEarth 2012b). The estimated quantity of this material, based on existing analytical data, is 340 tons (SoundEarth 2012b).
- **Nondangerous Soil.** Soil exhibiting PCE concentrations below the MTCA Method B cleanup level of 1.9 mg/kg but above the laboratory detection limit (0.025 mg/kg) as sourced from an F-listed waste material requires disposal as RCRA hazardous waste. In accordance with Ecology’s concurrence, the soil could potentially be disposed of at a Subtitle D landfill as nonhazardous waste following Ecology’s contained-in determination. The estimated quantity of this material based on existing analytical data and incorporating approximate clean overburden calculations is 97,200 tons (SoundEarth 2012b).
- **Clean Fill.** Soil that does not contain detectable concentrations of PCE will be considered clean fill material and is excluded from the remedial cost estimates.

The excavation contractor will use a soil management grid, which breaks the entire Remedial Excavation Area into 10-foot by 10-foot grid cells (Figures 26A through 26J), to readily identify and classify each grid cell for proper off-Site disposal and establish a trucking and disposal approach in accordance with the pre-classification of the soil that was developed based on the analytical data acquired during Site investigation activities. A soil management and disposal table that identifies each grid cell and the corresponding soil disposal classification is provided in Appendix C.

The excavation will be coordinated to first address the contaminated soil near the center of the source area in an effort to segregate and manage the dangerous waste. Excavation of the soil in this area will be carefully managed to ensure that the impermeable layer that the contaminated, perched water-bearing zone overlies is not penetrated. Any perched water encountered within the dangerous waste excavation area will be removed from the excavation via dewatering wells and stored in baker tanks pending laboratory analysis and proper disposal.

Once performance samples show that all of the PCE-contaminated soil above 1.9 mg/kg has been removed, the excavation of the remainder of the Remedial Excavation Area will commence in a clockwise fashion. The excavation will progress from the perimeter of the Property inward and will follow the shoring installation and progress in 10-foot lifts. In an effort to minimize the cross-contamination of clean soil, the contractor may use a conveyor belt system to transport excavated material to the truck staging area to be directly loaded and minimize tracking of soil across the site; establish an exclusion zone and place site controls such as tire and truck wash stations at the edge of the exclusion zone; limit the excavation on a daily or weekly basis to only remove contaminated soil to ensure proper decontamination of equipment prior to excavating clean soil; and line the truck and trailers with disposable liners.

In the event that the contamination within the Thomas Street ROW resulted from a release on the Property, the source of the contamination will be identified fairly quickly during excavation activities because the source area would likely be the closed-in-place USTs or a sewer leak, both of which would be encountered/removed at a fairly shallow depth. If such contaminated material is encountered, a mobile laboratory will be used to document soil concentrations and designate the soil for waste disposal according to the contaminant characteristics and in accordance with the contained-in determination that will be acquired for the Property prior to beginning excavation activities. Soil samples will be collected on a grid and will provide confirmation that all soil containing concentrations of PCE in excess of 1.9 mg/kg have been removed from the Property.

5.2.4.1 Contingency Plan to Address Unknown Contamination

The presence of aesthetic impacts and conditions encountered by site employees and equipment operators during the construction excavation activities at the Site may be indicative of conditions associated with contaminated media. Equipment operators will be instructed to use these criteria to alert the site superintendent and construction manager of potential issues of previously unidentified contamination at the Site in accordance with the communication plan (Figure 27). Any of the following occurrences are considered common sense criteria that may require a mitigation or remediation response. These criteria include, but are not limited to:

- Obvious petroleum staining, sheen, or colored hues in soil or standing water.
- The presence of petroleum products or leachate of other chemicals.
- The presence of utility pipe lines with sludge or trapped liquid indicating petroleum or chemical discharge sludge.
- The presence of buried pipes, conduits, tanks, or unexplained metallic objects or debris.

- Materials with a granular texture that suggests industrial origin.
- Vapors causing eye irritation or nose tingling or burning.
- White, chalky compounds or fine particulate soil layers.
- Presence of gasoline- or oil-like vapor or odor.
- Burnt debris or the presence of slag-like material.

Any criteria identified by on-Site personnel will be evaluated and, as appropriate, a sampling plan will be developed to properly characterize and manage the material in accordance with state and federal regulations.

Several subsurface anomalies were observed during the GPR survey conducted at the Property in 2010. In the event that a UST is encountered during the course of the excavation activities, a UST site assessment will be conducted under the oversight of a Washington state-certified UST site assessor, and the UST will be removed in accordance with the *Guidance for Site Checks and Site Assessment for Underground Storage Tanks* (Ecology 2003), *Underground Storage Tank Regulations* (WAC 173-360), and *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology 2011b). In the event that impacts to soil are observed, performance and confirmational soil samples will be collected and analyzed to ensure that the contaminated soil is removed and properly characterized prior to disposal.

5.2.5 Construction Dewatering

As discussed above, the contaminated perched groundwater that was observed near the center of the Property will be dewatered prior to starting the excavation activities. This will be accomplished by advancing two to three dewatering wells within the perched zone and pumping the water down until the wells are dry. The water generated will be transferred to a 6,800-gallon polyethylene AST. The storage tank will be located in an area that is accessible for a vacuum truck service to remove the contaminated water and transport it for treatment and disposal off the Site.

Water that is generated from surface water runoff due to precipitation events and any groundwater encountered during the course of the excavation will be gathered at a low point in the excavation as determined by the contractor and pumped to the AST prior to off-Site treatment and disposal. As discussed above, the final elevation of the excavation is anticipated to be between approximately 18 and 38 feet above NAVD88, or approximately 2 to 20 feet above the top of the primary water-bearing zone; therefore, extensive dewatering is not anticipated.

5.2.6 Parking Structure

Construction of the subgrade parking structure will commence after the excavation is completed. Architectural details for the project are not currently available; however, preliminary plans are to construct 4 to 5 levels of below-grade parking and a sub-grade retention basin. Footing drains will be completed along the exterior perimeter of the foundation to collect any groundwater that may come into contact with the structure. Considering the depth of the excavation (between approximately 18 and 38 feet above NAVD88), as well as the location of the primary water-bearing zone (approximately 16 feet above NAVD88), any groundwater collected at the footing drains is likely to be limited in volume.

The concrete shoring and foundation system will be constructed to act as a barrier to recontamination and vapor intrusion from the groundwater plume within the ROWs. Any vapor intrusion into the subgrade parking structure will be further mitigated by the venting system typically incorporated into such structures to avoid buildup of carbon monoxide and petroleum fumes generated by running vehicle engines.

5.3 CONSTRUCTION ACTIVITY SUMMARY—SOIL VAPOR EXTRACTION SYSTEM

If the source of the soil contamination observed in boring B50/MW16 at approximately 84 to 86 feet bgs is encountered during on-Property excavation activities, an SVE system will be installed to address the soil contamination within the ROW. As illustrated on Figures 28 through 32, horizontal SVE wells would be advanced under Thomas Street ROW to enhance the recovery of VOCs from the soil. Considering the depth of the contamination, the extent of any necessary SVE system was estimated based on a single data point and would be modified based on observations made during excavation activities. The following sections describe the preliminary SVE system design, well installation, O&M, and well and system decommissioning activities. A more detailed description of the design, installation, and operation of the SVE system to be conducted in conjunction with the Property redevelopment will be presented in the Engineering Design Report (EDR) that will be submitted to Ecology for review and approval prior to implementing system installation activities.

5.3.1 Soil Vapor Extraction System Design

The SVE system would utilize a 600 standard cubic feet per minute (cfm) positive displacement blower to apply a vacuum to a network of 2-inch-diameter extraction wells (Figures 28 and 29). The SVE system would apply approximately 50 cfm to each extraction well. The air flow recovery and vacuum applied to each well would be controlled using a manifold located in the equipment enclosure (Figures 30 and 31). The system would be designed to treat vapor-phase COCs that are recovered by the SVE blower using granular activated carbon to reduce vapor concentrations for discharge to the atmosphere. Any moisture recovered by the SVE system would be separated from the vapor stream by two moisture separators in series. Recovered water would be sampled and characterized for proper disposal.

5.3.2 Soil Vapor Extraction Well Installation

The preliminary SVE well design and specifications are presented on Figure 32. Approximately 11 horizontal extraction wells would be installed and advanced to an approximate distance of 45 to 50 feet beneath the Thomas Street ROW (Figures 28 and 29). The wells would be installed on 15-foot centers and, based on the geologic conditions encountered within the contaminated sand lense, assume an approximate radius of influence of 20 feet. All wells would be completed by a licensed well driller and comply with the requirements of WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.

Each extraction well would be constructed of 2-inch-diameter blank stainless steel casing, flush-threaded to 0.020-inch slotted well screen. The bottom of each of the wells would be fitted with a threaded stainless steel bottom cap, and the top of each well would be fitted with a PVC couple to transition from steel to PVC then connected to a 2-inch-diameter PVC conveyance pipe. Each extraction well would have a dedicated conveyance pipe that connects the extraction well head to the system piping manifold at the system enclosure (Figures 30 and 31). The manifold would allow for the individual control of vacuum and air flow to each SVE well.

Each extraction well would be completed with a bentonite seal extending down from the top of casing to 2 to 3 feet above the well screen. The annulus of the injection wells would be filled with #10/20 silica sand extending from the bottom of the bentonite seal to a total length of 45 to 50 feet. The well completion would be recorded in boring logs, examples of which are provided in Attachment A of the SAP.

Upon completion of drilling and extraction well installation activities, a survey of extraction well locations would be performed and top of casing elevations will be surveyed by Triad Associates for the purposes of providing an as-built for the SVE system well configuration. Elevations would be surveyed relative to the North American Vertical Datum of 1988 (NAVD88) using City of Seattle Benchmark No. 36690702 as the source benchmark. The extraction well locations and elevations would be surveyed prior to covering the extraction well points and conveyance piping beneath the mat slab foundation the wells.

The installation of the extraction wells and system piping would be completed concurrently with construction activities and prior to the installation of the mat slab foundation. The estimated remedial time frame for the SVE system is 3 years following the soil excavation activities.

5.3.3 Soil Vapor Extraction System Operation and Maintenance

Monthly vapor samples would be collected pre- and post-carbon treatment to evaluate mass removal and evaluate whether off-gas treatment is necessary prior to discharging to the atmosphere. Maintenance of the SVE blower and system optimization will be performed monthly. The SVE system would be set up with an autodialer to inform the operator when the system has a failure or has shut down as a result of system alarm conditions.

5.3.4 Monitoring Well and System Decommissioning

Upon completion of the required confirmational monitoring and Ecology’s issuance of an Interim Remedial Action completion letter, the soil vapor extraction wells would be decommissioned in accordance with the Ecology Water Well Construction Act (1971), RCW 18.104 (WAC 173-160-460). The wells would be decommissioned in place using bentonite clay. The SVE system would be decommissioned and all the associated equipment and aboveground piping would be removed from the Property.

5.4 CONSTRUCTION ACTIVITY SUMMARY—GROUNDWATER INJECTION SYSTEM

Once the final limits of the excavation are reached and prior to the completion of the mat slab foundation floor, the in situ groundwater treatment system will be installed (Figures 32 through 37). The following sections describe the groundwater injection system design, well installation, injection and bioaugmentation, and well decommissioning. A more detailed description of the groundwater injection system and its associated design details will be provided in the EDR.

5.4.1 Groundwater Injection System Design

After the final grades are achieved and prior to installing the building foundation, the remedial infrastructure required to treat the groundwater contamination plume using in situ reductive dechlorination will be installed. A barrier-type edible oil substrate (EOS) design will be applied at the Site with a series of five transects spaced approximately 75 feet apart (a distance equivalent to the estimated distance travelled by the Site groundwater over 3 years) and perpendicular to the groundwater flow direction for the purpose of injecting an EOS and *Dehalococcoides* genus bacteria (DHC) to treat the extent of the confirmed solvent plume (Figure 33). EOS will be used as a carbon source to deplete dissolved oxygen present in the aquifer, generate free hydrogen, and sustain a robust anaerobic dechlorinating microbial population. The indigenous microbial population will consume oxygen and generate an anaerobic environment, which is needed for DHC-mediated reductive dechlorination to occur. Reductive dechlorination of CVOCs occurs under strictly anaerobic conditions; unlike in aerobic conditions, where bacteria obtain energy by oxidizing reduced compounds (i.e., petroleum) while utilizing oxygen as the electron acceptor, reductive dechlorination is mediated by anaerobic bacteria (e.g., DHC), which obtain energy by oxidizing hydrogen and utilizing the CVOC as the electron acceptor. Through this process, chlorine atoms within the solvent molecules are replaced by hydrogen one by one. As such, PCE is reduced to TCE, which is reduced to cis-1,2-DCE, which is reduced to VC, and VC is reduced to ethane as a detoxified final degradation product. The presence of degradation products in groundwater across the Site confirms that Site conditions are conducive to reductive dechlorination, and enhancing this naturally occurring process with EOS and DHC will significantly reduce the remedial time frame.

Each of the five transects will span the width of the groundwater plume beneath the Property and will include approximately 46 injection wells placed on 15-foot centers with an overlapping radius of influence of 10 feet. The layout of the system will serve as a barrier to both on- and off-Site migration of contaminated groundwater. To address the groundwater plume beneath the Boren Avenue North and Thomas Street ROWs, approximately 12 angled injection wells will be installed beneath the ROWs; the base of the injection wells will be located at the western and southern boundaries, respectively, of the ROWs (Figure 33).

The relatively wide spacing of the injection wells along each transect is based on soil bulk density estimates developed by EOS Remediation, LLC, as well as the relatively permeable soil texture. This information was used to develop the approximate volume of EOS necessary to support a zone of anaerobic dechlorination sufficient to degrade the chlorinated solvents within groundwater beneath the Site (Appendix E of the FS Report; SoundEarth 2012b). Because of the upgradient TCE source, the amount of EOS that will be injected will increase from 75,000 pounds to 95,000 pounds in an effort to strengthen the remedial barrier within Boren Avenue North; the revised volume will ensure that a large quantity of EOS will remain in the subsurface for several years (the EOS remains in the subsurface until it is consumed by the microbial population), thus maintaining a long-term reducing environment to remediate any solvents entering the ROW from an upgradient, off-site source.

Approximately 1,600 pounds of EOS will be injected into each injection well over an estimated 5 week period. Pure EOS is usually diluted to 10 percent prior to the injection; the EOS emulsion will be mixed using a temporary injection system and pumped via a manifold into multiple injection wells simultaneously, allowing for the delivery of up to 3,700 pounds per day (Figures 36 and 37). Actual injection rates will vary from well to well and will be monitored individually.

The zone where natural attenuation may supplement active groundwater treatment is upgradient and crossgradient of the treatment area (south and west of the proposed conditional points of compliance), and any generated degradation products would likely be consumed within the anaerobic dechlorination zone.

5.4.2 Injection Well Installation

The preliminary injection well design and specifications are presented on Figure 32. There will be approximately 58 injection wells: 46 vertical injection wells will be advanced to a depth of 35 feet below the saturated zone and 12 angled injection wells will be advanced beneath the ROW to a total vertical depth of 35 feet bgs. The angle and placement of the angled injection wells will vary by location to maximize the distribution of EOS beneath the Boren Avenue North and Thomas Street ROWs (Figures 33 through 35). The wells will be installed in an alternating fashion with the building footings, which will allow the contractor to work from the Remedial Excavation Area outward as the groundwater treatment system is installed. All wells will be completed by a licensed well driller and comply with the requirements of WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.

Each injection well will be constructed of 2-inch-diameter blank PVC casing, flush-threaded to 0.020-inch slotted well screen. The bottom of each of the wells will be fitted with a threaded PVC bottom cap, and the top of each well will be fitted with a PVC reducer bushing and connected to a 1-inch-diameter PVC conveyance pipe. Each injection well will have a dedicated conveyance pipe that connects the injection well head to the system piping manifold at the system enclosure (Figures 32, 36, and 37).

Each injection well will be completed with a bentonite seal extending down from the top of casing, which will be the approximate elevation at the base of the excavation. The annulus of the injection wells will be filled with #10/20 silica sand extending from the bottom of the bentonite seal to total depth. The well completion will be recorded in boring logs, examples of which are provided in Attachment A of the SAP.

Upon completion of drilling and injection well installation activities, a survey of injection well locations will be performed and the wells will be developed. The horizontal and vertical injection well locations and top of casing elevations will be surveyed by Triad Associates for the purposes of providing an as-built for the injection system well configuration. Elevations will be surveyed relative to the North American Vertical Datum of 1988 (NAVD88) using City of Seattle Benchmark No. 36690702 as the source benchmark. The injection well locations and elevations will be surveyed prior to covering the injection well points and conveyance piping beneath the mat slab foundation the wells.

The injection wells will be developed by SoundEarth field staff with the use of a Grundfos submersible pump and will consist of surging and purging until a minimum of five well volumes are removed and the groundwater no longer appears turbid. Turbidity will be measured visually by field staff conducting development activities. The installation of the injection wells and system piping will be completed concurrently with construction activities and prior to the installation of the mat slab foundation. The estimated remedial time frame for groundwater restoration is 5 years following the initial EOS injection event.

5.4.3 Injection and Bioaugmentation

Each injection well will be equipped with a pipe that runs beneath the foundation slab from the well head to the injection manifold, which will be housed in either a system piping enclosure or sub-grade vault. A temporary injection system will be used to introduce EOS and DHC into each of the injection wells (Figures 36 and 37). The temporary injection system will connect directly to the manifold piping to avoid the need for permanent injection equipment to be maintained within the parking garage. The injection manifold will be readily accessible for both the initial and future injection events if necessary.

The EOS will be applied at a pressure ranging from 5 to 15 pounds per square inch. Approximately 1,600 pounds of EOS will be applied to each injection well over a 5-week time frame.

Bioaugmentation will be implemented if compliance groundwater monitoring indicates that the native population of DHC needs to be supplemented. One of the proprietary DHC groups, KB1 or SB9, will be injected.

Prior to injecting at the Site, the individual injection wells will be registered with Ecology's Underground Injection Control Program.

5.4.4 Injection Well Decommissioning

Upon completion of the Ecology-required confirmational monitoring and Ecology's issuance of an Interim Remedial Action completion letter, the injection wells will be decommissioned in accordance with the Ecology Water Well Construction Act (1971), RCW 18.104 (WAC 173-160-460). The wells will be decommissioned in place using bentonite clay.

6.0 COMPLIANCE MONITORING

There are three types of compliance monitoring identified for remedial cleanup actions performed under MTCA (WAC 173-340-410): protection, performance, and confirmational monitoring. A paraphrased definition for each is presented below (WAC 173-340-410[1]). Additional details regarding procedures for sample collection, handling, and quality assurance procedures are included in the SAP and HASP, which are attached to this report as Appendices A and B, respectively.

- **Protection Monitoring**—To evaluate whether human health and the environment are adequately protected during construction and the O&M period of an interim action or cleanup action.
- **Performance Monitoring**—To document that the interim action or cleanup action has attained cleanup standards.
- **Confirmational Monitoring**—To evaluate the long-term effectiveness of the interim action or cleanup action once cleanup standards or other performance standards have been attained.

6.1 PROTECTION MONITORING

A HASP has been prepared for the interim action that meets the minimum requirements for such a plan identified in federal (29 CFR 1910.120, and 1926) and state regulations (WAC 296). The HASP identifies all known physical, chemical, and biological hazards; hazard monitoring protocols; and administrative and engineering controls required to mitigate the identified hazards (Appendix B).

6.2 PERFORMANCE MONITORING

Performance monitoring includes the collection of soil samples from the sidewalls and floor of the dangerous waste excavation, the collection of soil samples during excavation and removal of any previously unidentified contamination, and the collection of quarterly groundwater samples from the points of compliance.

6.2.1 Vapor Performance Monitoring

To evaluate the effectiveness of the SVE system (if installed) in remediating the soil and soil gas beneath the Thomas Street ROW, vapor performance monitoring will be conducted monthly during O&M of the remediation system using vapor samples collected from the remediation system's influent and effluent stacks. Concentrations of COCs in the influent performance vapor samples will be plotted as a function of time to evaluate mass removal rates. When the mass removal rate reaches an asymptotic level and concentrations of COCs in the influent vapor samples drop to below laboratory reporting limits, the vapor samples will be considered confirmational and the remediation system will be shut down.

6.2.2 Soil Performance Monitoring

The limits of the excavation were modeled using the existing soil analytical data and the results of the model are shown on Figures 26A through 26J. Performance samples will be collected and analyzed using a mobile laboratory to confirm that all of the dangerous waste soil (e.g., soil exhibiting concentrations of PCE above 1.9 mg/kg) has been removed. Post-excavation soil sampling will not be conducted along the bottom or sidewalls within the Remedial Excavation Area because the soil analytical data collected at the Site are sufficient to provide a bound for contaminated soil.

A contingency for performance samples will be retained in the event that an unknown condition is encountered during the course of the excavation, such as a UST. In this case, performance monitoring for soil will be conducted and the analytical results will direct the advancement of the excavation and characterize the soil for disposal.

Soil samples will be collected directly from the sidewalls and/or bottom of the dangerous waste excavation using either stainless steel or plastic sampling tools. Soil samples collected at depths of less than 4 feet bgs will be collected manually. Samples collected at depths below 4 feet bgs will be collected with the backhoe bucket unless engineering controls are in place that allow for manual sample collection at depths greater than 4 feet bgs. All non-dedicated sampling equipment will be decontaminated between uses. A detailed scope for monitoring and sampling contaminated soil is discussed in the SAP (Appendix A). The samples will be submitted for laboratory analysis and the analytical results will be used to assess when the points of compliance for soil have been achieved within the dangerous waste excavation area.

6.2.3 Groundwater Performance Monitoring

Upon completion of the excavation and the initial EOS and DHC injection event, the treated groundwater will be monitored for an estimated period of 5 years. The existing network of groundwater monitoring wells around the perimeter of the Property and five proposed monitoring wells/compliance points will be sampled quarterly to evaluate the progression of reductive dechlorination in groundwater beneath the Property and adjoining ROWs. The proposed monitoring well construction details and specifications are presented on Figure 32, and the proposed groundwater monitoring well locations/compliance points are shown on Figure 38 and summarized below. Actual depths and screen intervals will be determined based on groundwater conditions observed during drilling.

Each monitoring well will be constructed of 2-inch-diameter blank PVC casing, flush-threaded to 0.010-inch slotted well screen. The bottom of each of the wells will be fitted with a threaded PVC bottom cap, and the top of each well will be fitted with a locking compression-fit well cap.

The annulus of the monitoring wells will be filled with #10/20 silica sand to a minimum height of 1 foot above the top of the screened interval. A bentonite seal with a minimum thickness of 1 foot will be installed above the sand pack. The wells will be completed at the surface with a flush-mounted, traffic-rated well box set in concrete. The well completion will be recorded in boring logs, examples of which are provided in Attachment A of the SAP.

Upon completion of drilling and monitoring well installation activities, a survey of Property features and monitoring well locations will be performed, and the wells will be developed. The horizontal and vertical monitoring well locations and top of casing and monument elevations will be surveyed by Triad Associates for the purposes of calculating groundwater flow gradient and direction. Elevations will be surveyed relative to NAVD88 using City of Seattle Benchmark No. 36690702 as the source benchmark.

The monitoring wells will be developed by SoundEarth field staff with the use of a Grundfos submersible pump and will consist of surging and purging until a minimum of five well volumes are removed and the groundwater no longer appears turbid. Turbidity will be measured visually by field staff conducting development activities. Groundwater samples will be collected and handled in accordance with the 1996 EPA guidance document, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures* at least 24 hours following well development.

Groundwater samples will be submitted to the laboratory and analyzed for chlorinated solvents and petroleum hydrocarbons. The analytical results will be used to assess when the points of compliance for groundwater have been achieved, which is anticipated to be following the collection of four consecutive quarters of compliant groundwater results.

6.2.4 Waste Profiling

Wastes generated during the interim action require analytical testing before disposal. Generally, the treatment, storage, and disposal facility (TSDF) receiving the waste specifies the minimum number of samples and analyses before accepting wastes from a site; at the Site, data generated during the RI activities is sufficient to develop a waste profile. Wastes that will be generated from the remedial action and destined for off-Site disposal include:

- Soil contaminated with PCE and its degradation products, GRPH (as Stoddard solvents), DRPH, ORPH, and associated compounds
- Contaminated groundwater from excavation dewatering
- Contaminated personal protective equipment
- Decontamination solutions
- Miscellaneous solid wastes

Each waste stream will be profiled separately in accordance with the minimum waste analyses requirements of the respective permitted TSDF. Excavated contaminated soil will be handled according the soil management grid (Figures 26A through 26J) and corresponding soil disposal and classification table (Appendix C). If unforeseen soil conditions are encountered, additional waste profiling may be required to ensure proper classification and disposal.

6.3 CONFIRMATIONAL MONITORING

Confirmational monitoring will commence after the analytical data from the performance monitoring indicates that cleanup objectives have been achieved.

6.3.1 Vapor Confirmation Monitoring

Vapor samples collected from the influent during monthly O&M activities that do not contain detectable concentrations of COCs will be used to confirm the effectiveness of the SVE system on remediating soil and soil gas beneath the Thomas Street ROW. Vapor samples will be collected monthly, as described in Section 6.2.1, or more frequently if necessary, to comply with the Puget Sound Clean Air Agency Regulation 1, Section 6.03(c)(94), which limits the discharge mass to less than 15 pounds per year of benzene or VC, 500 pounds per year of PCE, and 1,000 pounds per year of toxic air contaminants.

6.3.2 Soil Confirmational Monitoring

Existing sample results will be used for soil confirmational monitoring. With the exception of the dangerous waste excavation area and any additional source areas identified during excavation activities, no further confirmational soil monitoring is proposed for the Remedial Excavation Area because the excavation plan includes removal of all contaminated soil from the Site. The excavated soil will be handled according to the soil management grid (Figures 26A through 26J).

Confirmational monitoring may be required if unforeseen soil conditions are encountered during the course of the excavation. In the event that unanticipated conditions are encountered and confirmational soil samples are required, samples will be collected from the bottom and the sidewalls of the excavation to confirm that cleanup levels have been achieved.

6.3.3 Groundwater Confirmational Monitoring

It is anticipated that the Site groundwater quality will be improved by virtue of removing the source area from the Property; any residual contamination will be addressed by in situ reductive dechlorination. To confirm the effectiveness of the interim action on groundwater quality, groundwater samples will be collected on a quarterly basis from the monitoring wells MW01 through MW05, MW07, MW13, MW14, MW15, and MW16 and three new monitoring wells located on the Property (Figure 38). These wells are considered representative of groundwater conditions within and downgradient of the source area. Once four quarters of clean (e.g., concentrations of COCs are below their respective cleanup levels), post-remediation groundwater analytical data are achieved, the groundwater beneath the Site will be considered to be compliant with MTCA.

7.0 DOCUMENTATION REQUIREMENTS

Documentation of the interim action is necessary to meet MTCA requirements. The applicable and relevant documentation generated for the interim action will be submitted to Ecology for review and approval in accordance with the conditions set forth in the Amended Agreed Order No. DE 8996. Copies of the documents will be retained for a minimum of 3 years after completion of the interim action.

7.1 DOCUMENTATION MANAGEMENT

An established document control system to be implemented during the interim action includes the following elements, as appropriate: field report forms, excavation logs, sample summary forms, material import and export summary forms, groundwater purge and sample forms, sample chain of custody forms, waste inventory documentation, waste management labels, and sample labels. Disposal manifests for the waste generated during the interim action will be maintained and submitted with the project documentation.

7.2 WASTE DISPOSAL TRACKING

Specific documentation requirements will be met for transportation and disposal of the contaminated soil and groundwater during the excavation activities to ensure compliance with state and federal regulations. The waste disposal tracking documentation includes analytical data, waste profiles, waste manifests, and bills of lading.

7.3 COMPLIANCE REPORTS

An Interim Action Progress Report will be prepared following completion of the excavation activities to demonstrate compliance for soil at the points of compliance defined for the Site. At a minimum, the report will include the following:

- A description of the excavation and construction activities and the installation and operation of the injection system and associated piping.
- Documentation of waste disposal tracking for the excavated soil, generated wastewater, and other associated materials.
- A figure depicting the final limits of the remedial excavation and the soil sample locations, as applicable.
- A summary of compliance monitoring analytical results.
- A description of planned work and deliverables for the confirmational monitoring elements of the interim action.

An Interim Action Closure Report will be prepared following completion of the final quarterly groundwater monitoring event. The Closure Report will include the following:

- A description of the quarterly groundwater monitoring activities.
- A summary of the compliance sampling analytical results for groundwater for samples collected during quarterly groundwater monitoring, including summary tables.
- A figure depicting primary Site features and points of compliance/monitoring well locations.
- SoundEarth's conclusions pertaining to the interim action following the completion of four consecutive quarters of confirmational groundwater monitoring.

When the compliance reports have been finalized, the reports will be submitted to Ecology for review and approval.

7.4 INTERIM ACTION COMPLETION LETTERS

Upon completion of the excavation and system installation activities, SoundEarth will prepare and submit to Ecology an Initial Interim Action Completion Report detailing the excavation of all contaminated soil from the Property and the as-builts of the remediation system(s) installed at the Property and adjoining Boren Avenue North and Thomas Street ROWs. Upon review and approval of the report, Ecology will submit a letter confirming successful removal of contaminated soil from the Property.

Upon collection of confirmational groundwater and (if applicable) soil vapor samples from the Property and adjoining ROWs, SoundEarth will prepare and submit to Ecology an Interim Action Closure Report detailing the results of the interim action. Upon review and approval of the report, Ecology will submit a letter confirming that the interim action successfully remediated the Property and adjoining ROWs, and that no further remedial action will be required at the Property.

8.0 LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, expressed or implied, is made. These services were performed consistent with our agreement with Touchstone. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

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FIGURES

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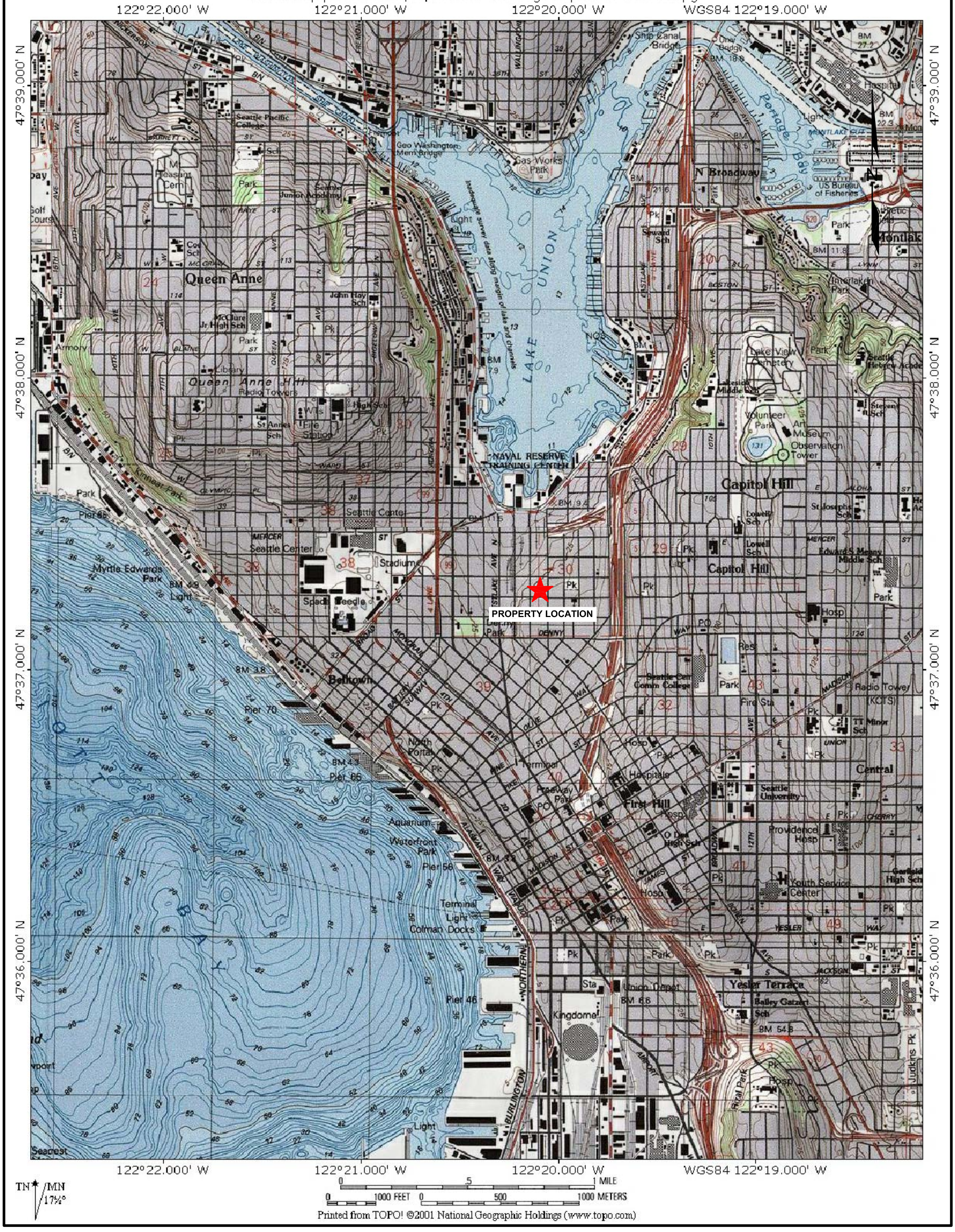

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PROJECT NUMBER: 0731-004-04
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

FIGURE 1

PROPERTY
LOCATION MAP

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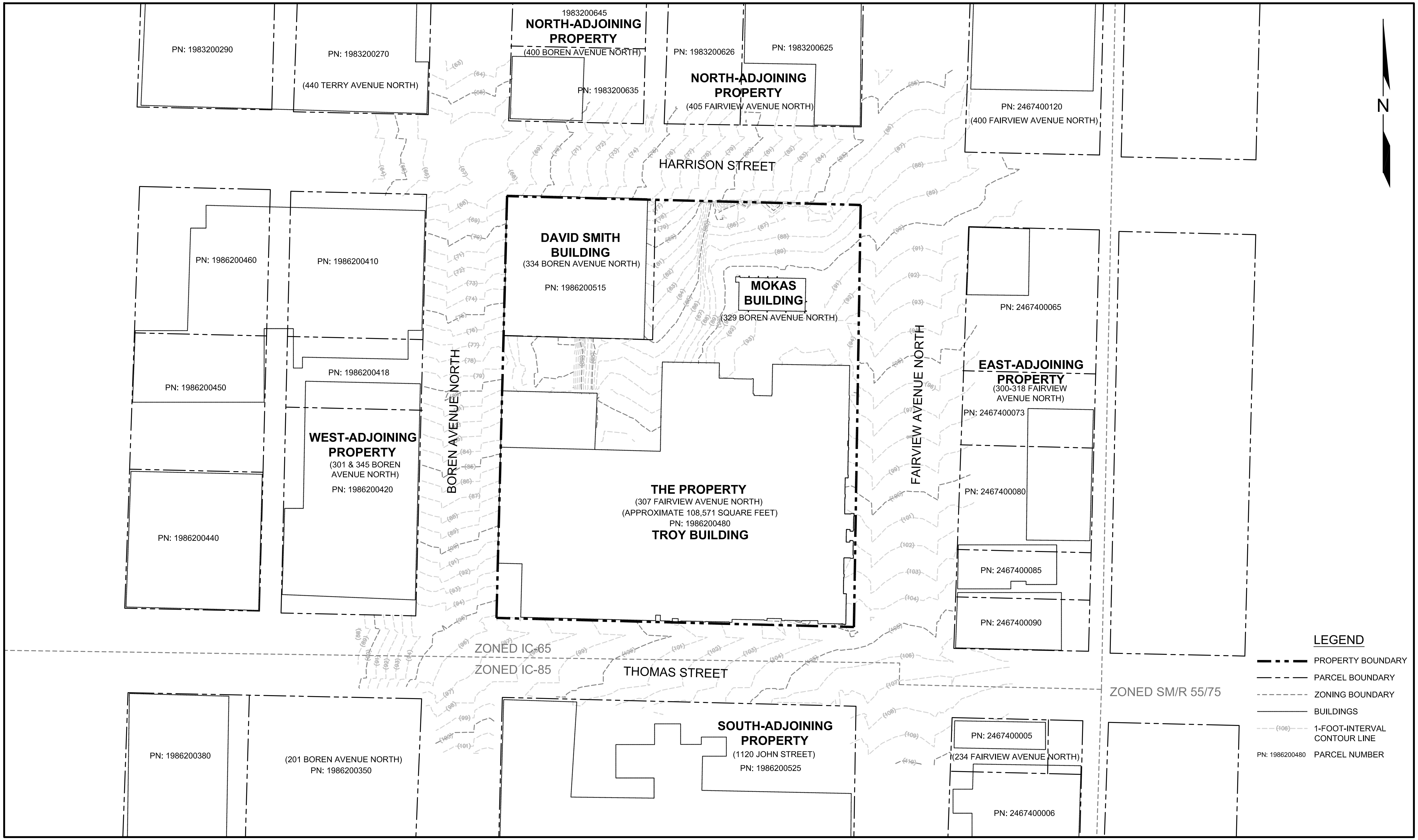

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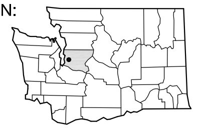

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APPROXIMATE SCALE IN FEET

FIGURE 2

SITE LOCATION MAP

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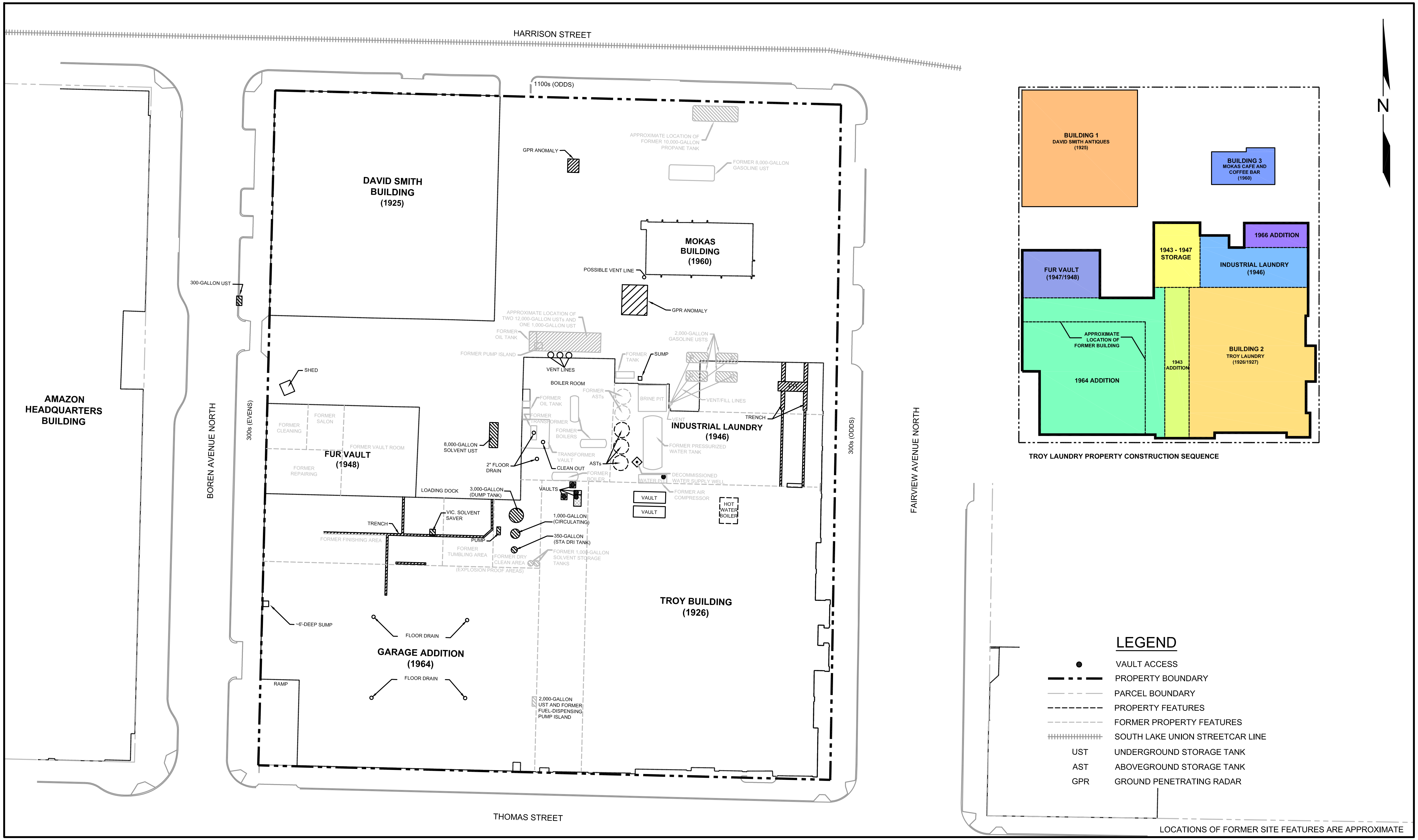

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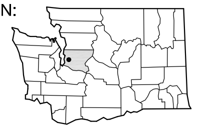

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APPROXIMATE SCALE IN FEET

FIGURE 3
PROPERTY PLAN

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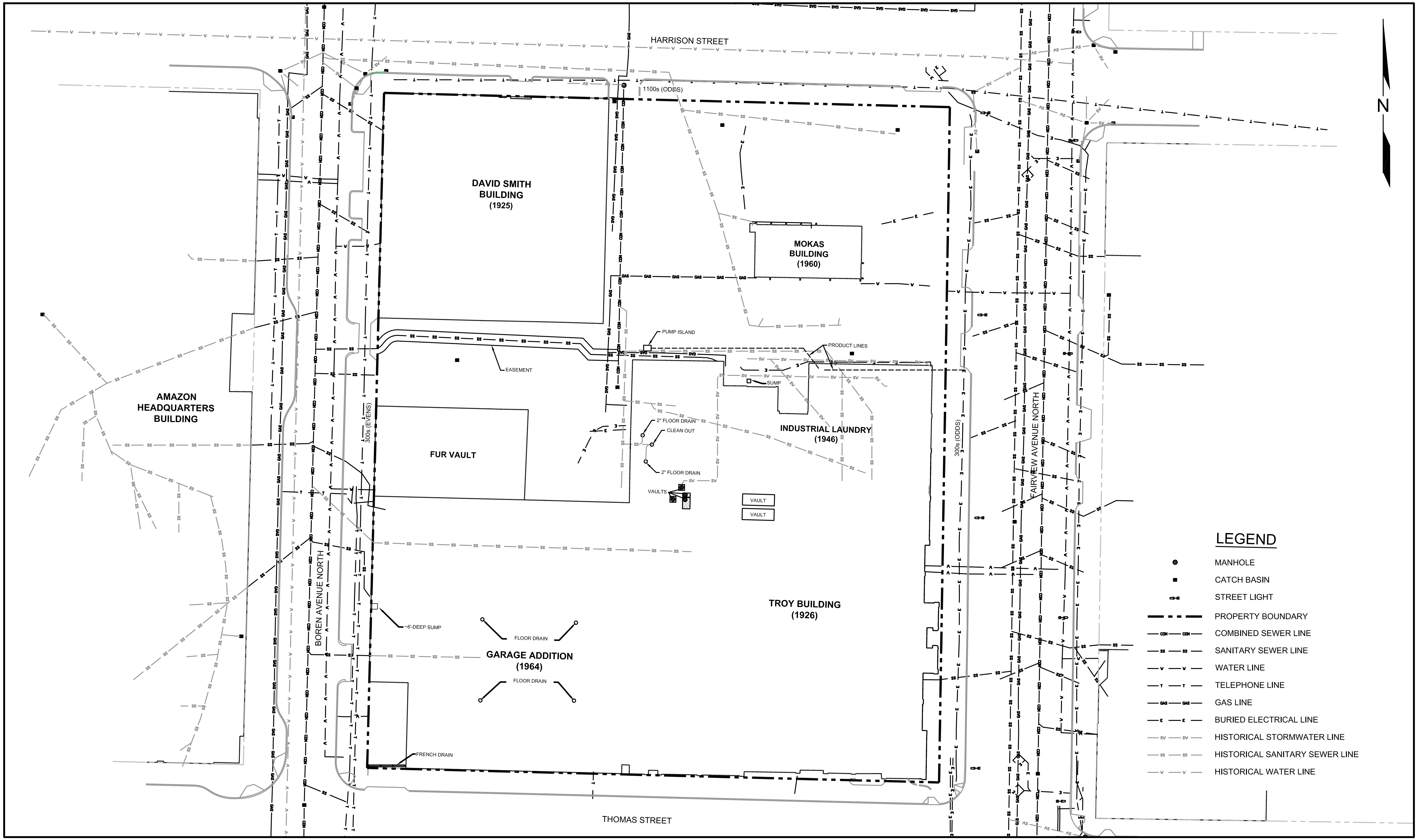

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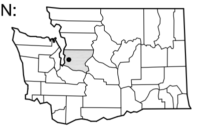

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APPROXIMATE SCALE IN FEET

FIGURE 4
SUBSURFACE UTILITIES MAP

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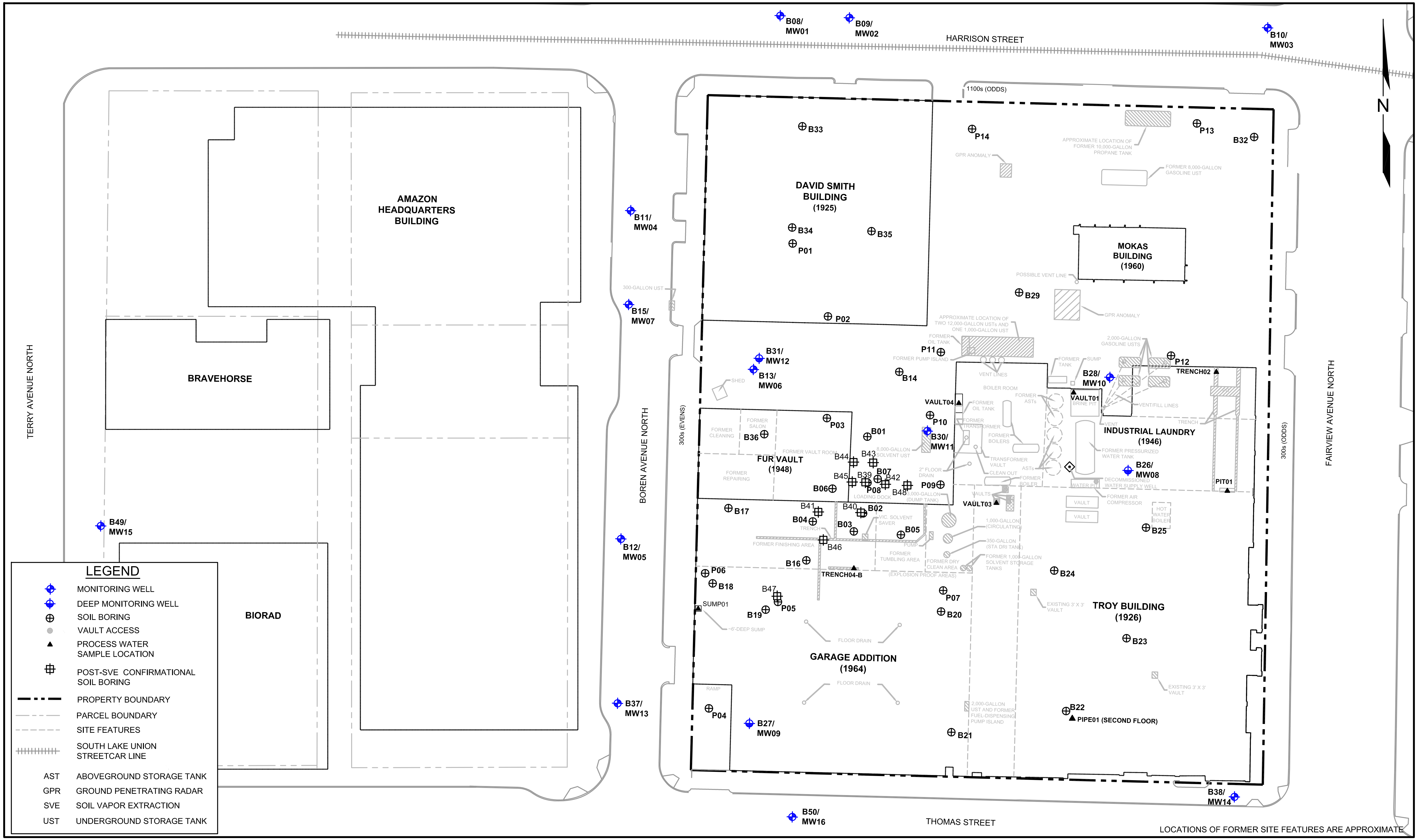

LOCATIONS OF FORMER SITE FEATURES ARE APPROXIMATE

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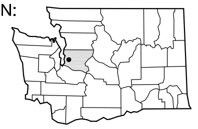

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APPROXIMATE SCALE IN FEET

FIGURE 5
EXPLORATION LOCATION PLAN

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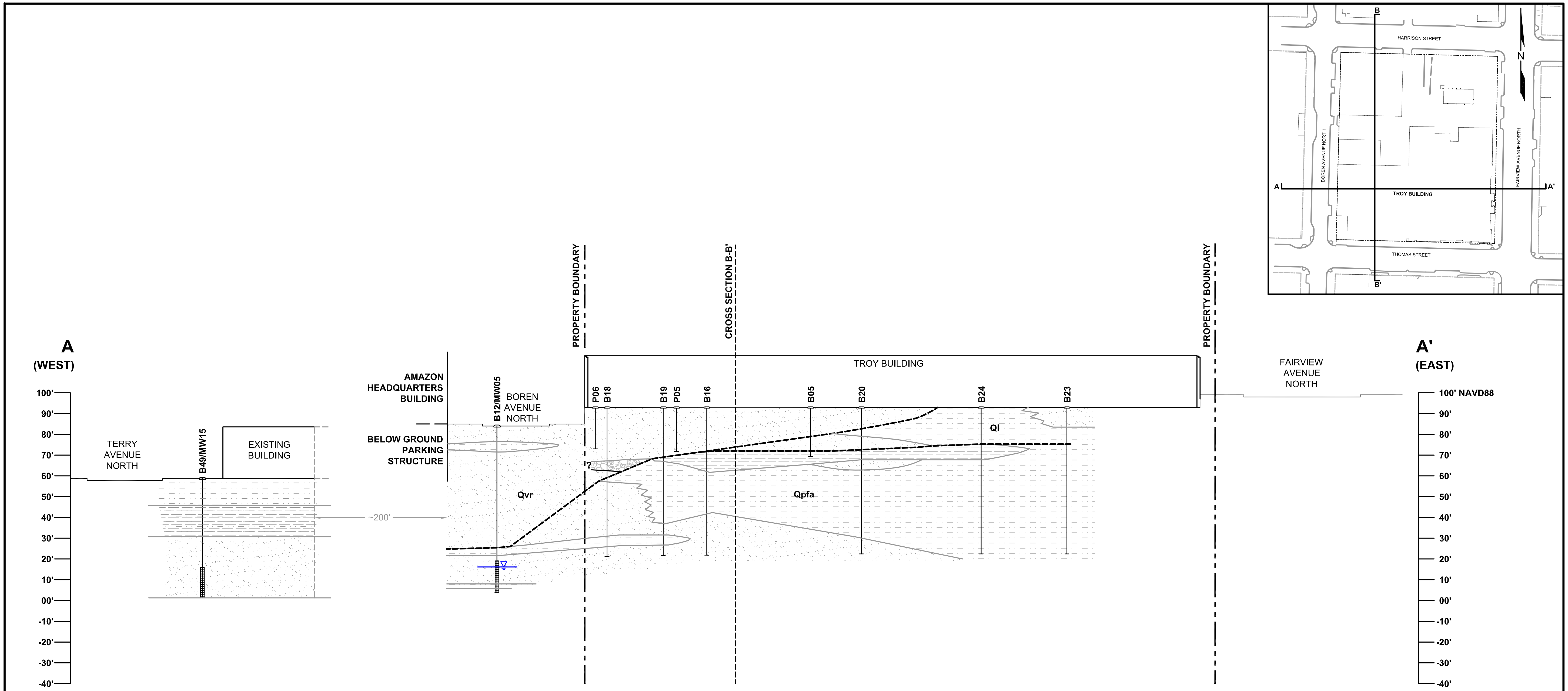

LEGEND

MONITORING WELL

SCREEN INTERVAL

GROUNDWATER LEVEL (OCTOBER 20, 2011)

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS):

░	SP AND SP-SM: MOSTLY FINE TO MEDIUM-GRAINED SANDS AND SANDS WITH SILTS, WITH VARYING AMOUNTS OF GRAVEL.
░	SM: SILTY FINE TO MEDIUM SANDS WITH VARYING AMOUNTS OF GRAVEL.
▤	ML AND SM: SILTS AND SANDY SILTS, GRADING TO SILTY SANDS. MAY LOCALLY CONTAIN VARIOUS AMOUNTS OF COARSE SAND, GRAVEL AND COBBLES.
▨	GP: GRAVEL WITH SAND AND VARYING AMOUNTS OF SILT. SOME COBBLES. HORIZONTALLY DISCONTINUOUS.

Qvr	VASHON RECESSIONAL OUTWASH DEPOSITS: PREDOMINANTLY LOOSE TO MEDIUM DENSE, FINE TO MEDIUM-GRAINED SANDS AND SANDS WITH SILTS, WITH VARYING GRAVEL CONTENTS. LOCALIZED DEPOSITS OF GRAVEL AND/OR GRAVEL RICH SANDS. TYPICALLY GRAY TO GRAYISH-BROWN OR LIGHT BROWN. MINOR, DISCONTINUOUS INTERBEDS OF SILTY SAND AND SILT.
Qi	ICE-CONTACT DEPOSITS: PREDOMINANTLY VERY DENSE, SILTY FINE SANDS WITH VARYING GRAVEL CONTENTS, BROWN TO DARK BROWN OR GRAYISH-BROWN IN COLOR.
Qpfa	PRE-FRASER NONGLACIAL DEPOSITS: PREDOMINANTLY VERY DENSE, FINE TO MEDIUM SANDS AND SANDS WITH SILTS, INTERBEDDED WITH AND GRADING LATERALLY INTO SILTY FIND SANDS. GRAVEL CONTENT VARIES. LOCALIZED DEPOSITS OF GRAVEL AND/OR GRAVEL-RICH ZONES. TYPICALLY BROWN TO LIGHT BROWN OR GRAY-BROWN, WITH LOCAL HORIZONS OF REDDISH-BROWN OXIDATION. AN UPPER LAYER OF DARK BROWN OXIDAL ORGANIC-RICH SILT AND SILTY SAND EXTENDS ACROSS A PORTION OF THE SITE.

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CITY,STATE: SEATTLE, WASHINGTON

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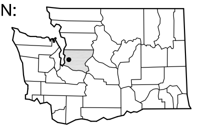

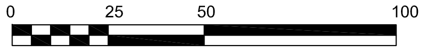

APPROXIMATE SCALE IN FEET

FIGURE 6
GEOLOGIC CROSS SECTION A-A'

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_XAA_F.DWG

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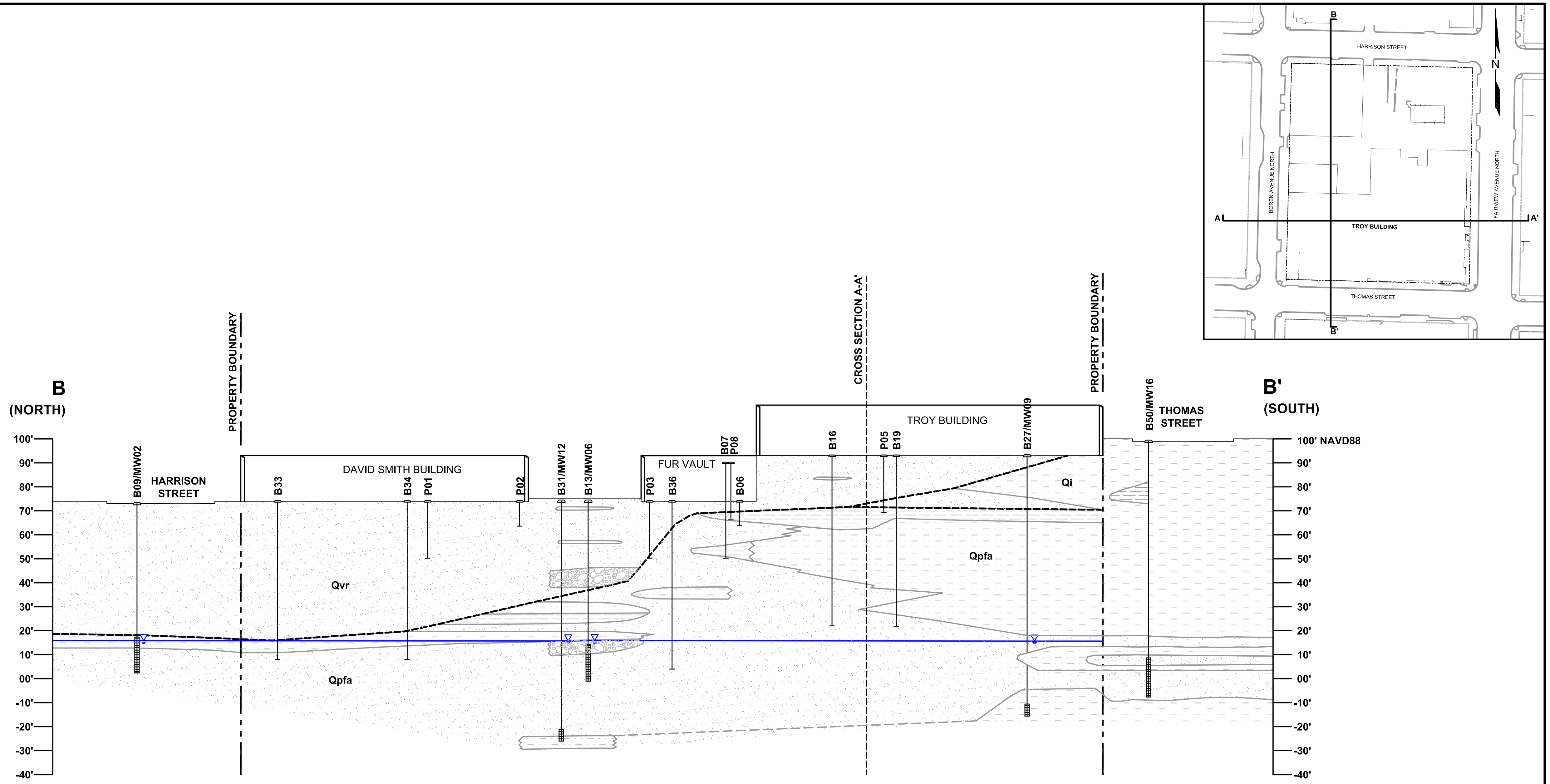

LEGEND

MONITORING WELL
SCREEN INTERVAL
GROUNDWATER LEVEL (OCTOBER 20, 2011)

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS):

▨	SP AND SP-SM: MOSTLY FINE TO MEDIUM-GRAINED SANDS AND SANDS WITH SILTS, WITH VARYING AMOUNTS OF GRAVEL.
▨	SM: SILTY FINE TO MEDIUM SANDS WITH VARYING AMOUNTS OF GRAVEL.
▨	ML AND SM: SILTS AND SANDY SILTS, GRADING TO SILTY SANDS. MAY LOCALLY CONTAIN VARIOUS AMOUNTS OF COARSE SAND, GRAVEL AND COBBLES.
▨	GP: GRAVEL WITH SAND AND VARYING AMOUNTS OF SILT. SOME COBBLES. HORIZONTALLY DISCONTINUOUS.

Qvr	VASHON RECESSIONAL OUTWASH DEPOSITS: PREDOMINANTLY LOOSE TO MEDIUM DENSE, FINE TO MEDIUM-GRAINED SANDS AND SANDS WITH SILTS, WITH VARYING GRAVEL CONTENTS. LOCALIZED DEPOSITS OF GRAVEL AND/OR GRAVEL RICH SANDS. TYPICALLY GRAY TO GRAYISH-BROWN OR LIGHT BROWN. MINOR, DISCONTINUOUS INTERBEDS OF SILTY SAND AND SILT.
Qi	ICE-CONTACT DEPOSITS: PREDOMINANTLY VERY DENSE, SILTY FINE SANDS WITH VARYING GRAVEL CONTENTS, BROWN TO DARK BROWN OR GRAYISH-BROWN IN COLOR.
Qpfa	PRE-FRASER NONGLACIAL DEPOSITS: PREDOMINANTLY VERY DENSE, FINE TO MEDIUM SANDS AND SANDS WITH SILTS, INTERBEDDED WITH AND GRADING LATERALLY INTO SILTY FIND SANDS. GRAVEL CONTENT VARIES. LOCALIZED DEPOSITS OF GRAVEL AND/OR GRAVEL-RICH ZONES. TYPICALLY BROWN TO LIGHT BROWN OR GRAY-BROWN, WITH LOCAL HORIZONS OF REDDISH-BROWN OXIDATION. AN UPPER LAYER OF DARK BROWN OXIDIZED ORGANIC-RICH SILT AND SILTY SAND EXTENDS ACROSS A PORTION OF THE SITE.

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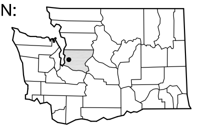
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 7
GEOLOGIC CROSS SECTION B-B'

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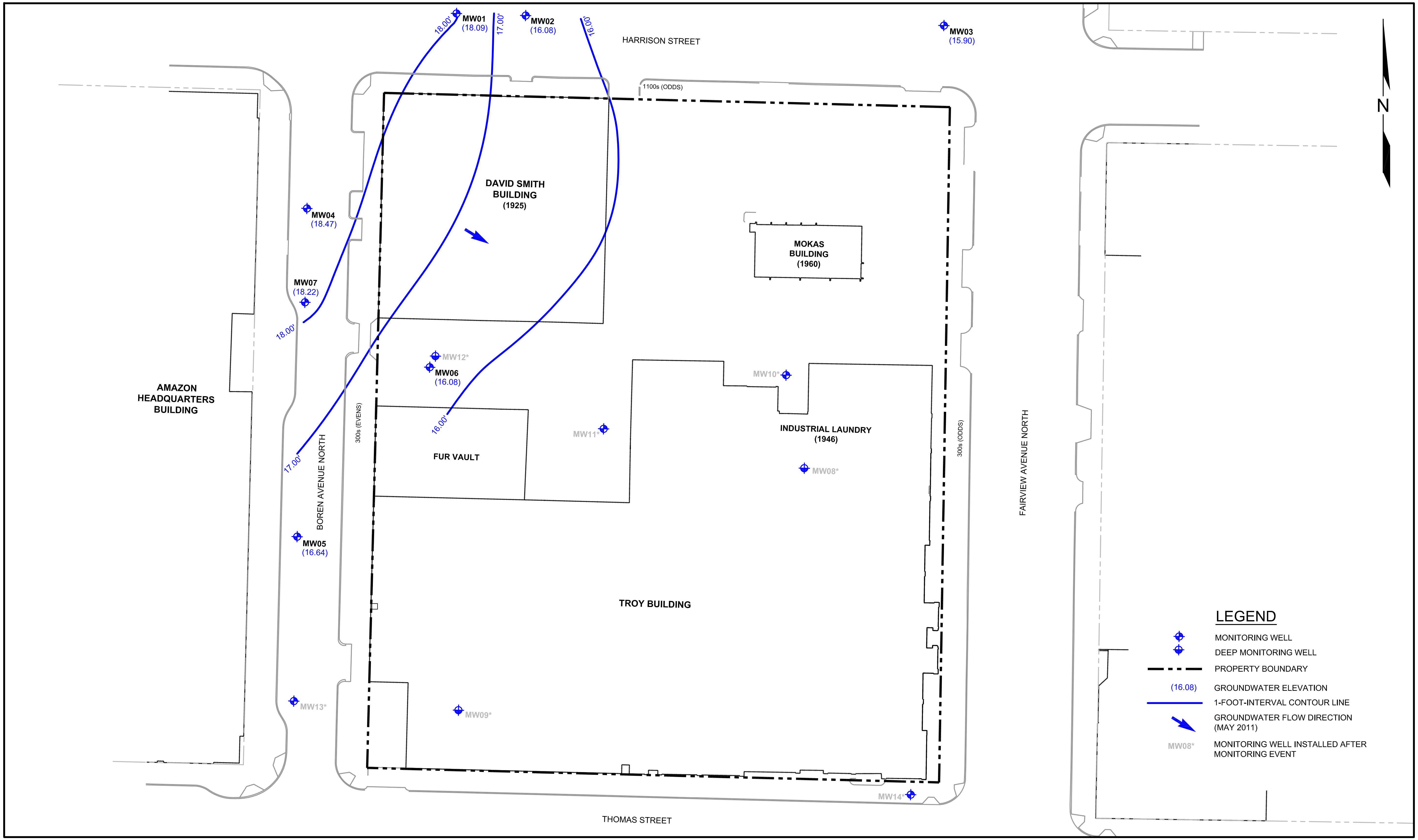
P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2012CAP_CM1_F.DWG



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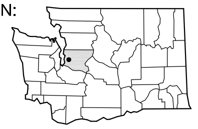
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:

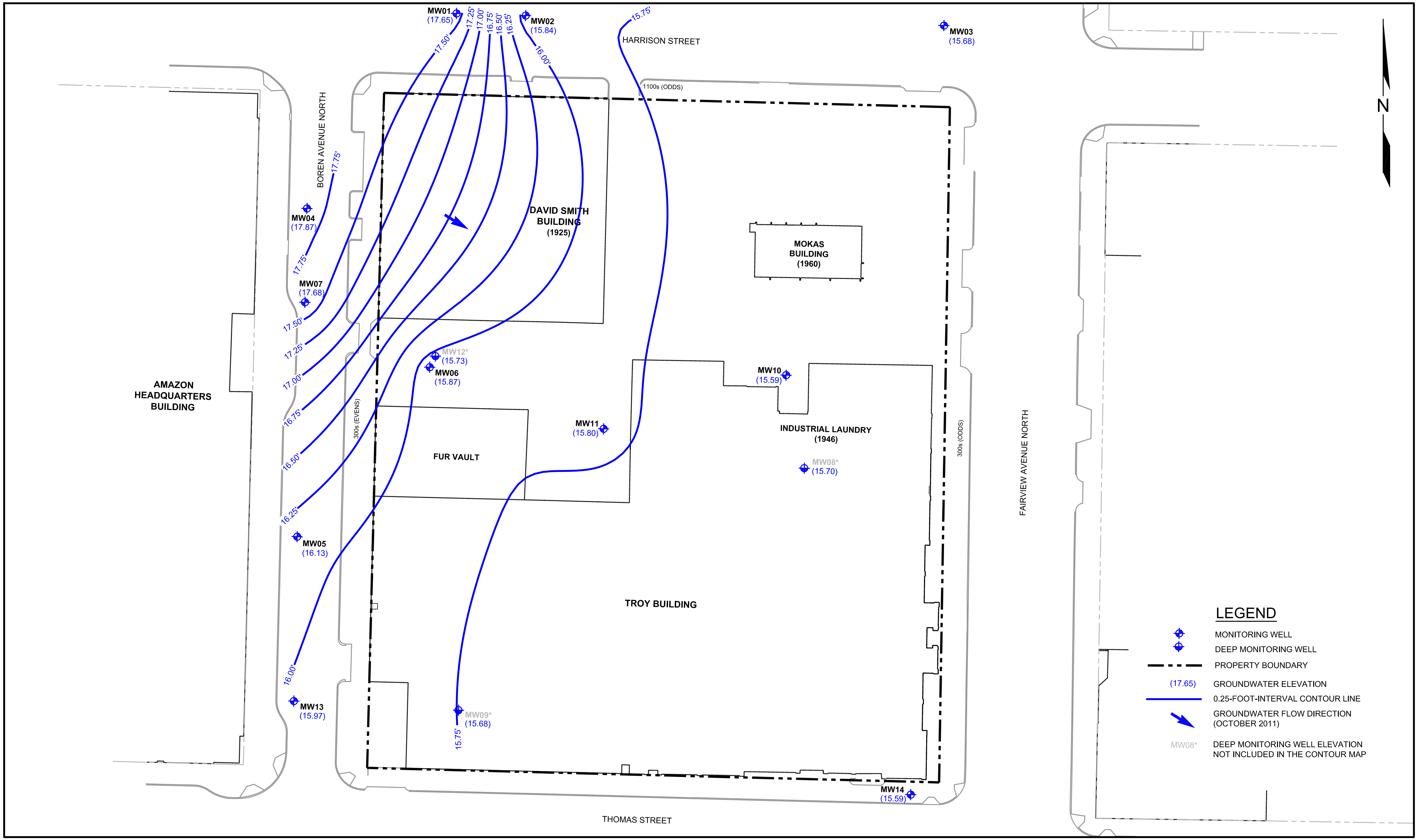


0 25 50 100

APPROXIMATE SCALE IN FEET

FIGURE 8

GROUNDWATER CONTOUR MAP
(MAY 2011)



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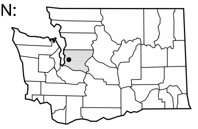
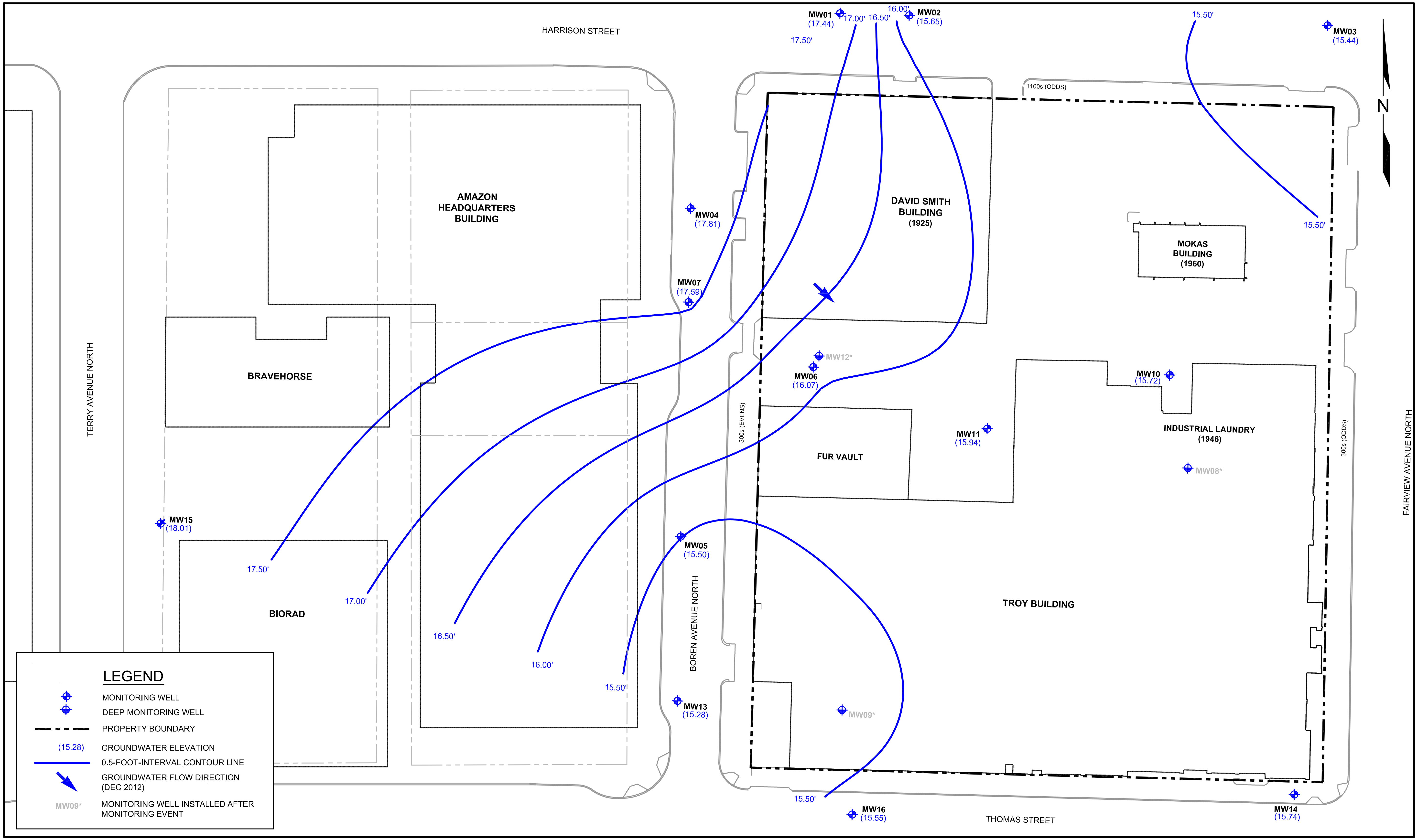
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 9
GROUNDWATER CONTOUR MAP
(OCTOBER 2011)



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DRAWN BY: JQC
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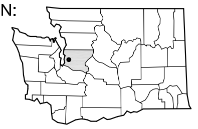
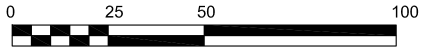
CAD FILE: 0731-004_2013ICAP_CM3

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET

FIGURE 10
GROUNDWATER CONTOUR MAP
(DECEMBER 2012)

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_CM3_F.DWG

1/16/2013

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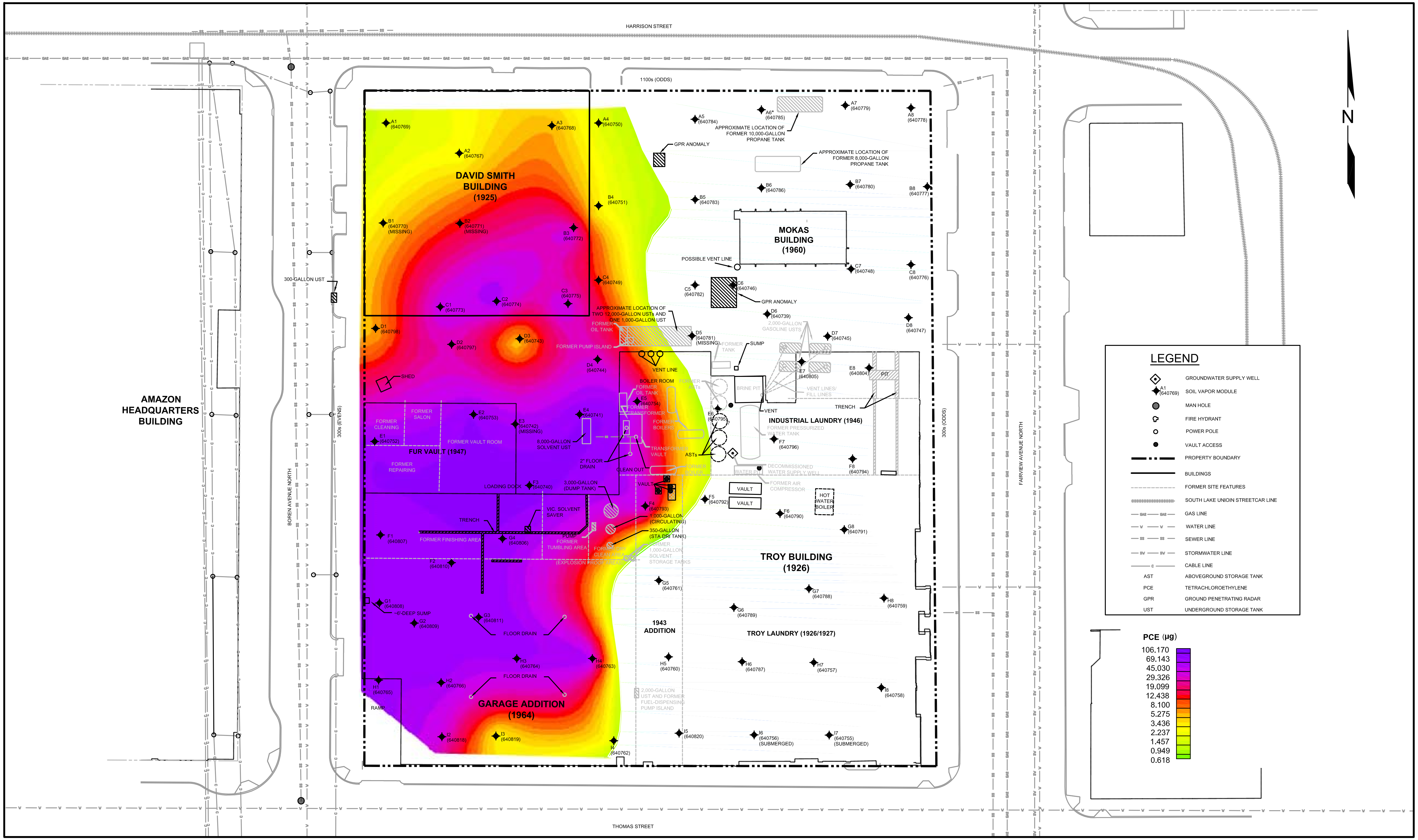

1/17/2013

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_PCE_F.DWG

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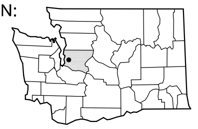
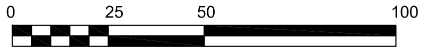
DATE: 12/02/11
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0731-004_2013ICAP_PCE

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET

FIGURE 11
PCE IN SOIL VAPOR

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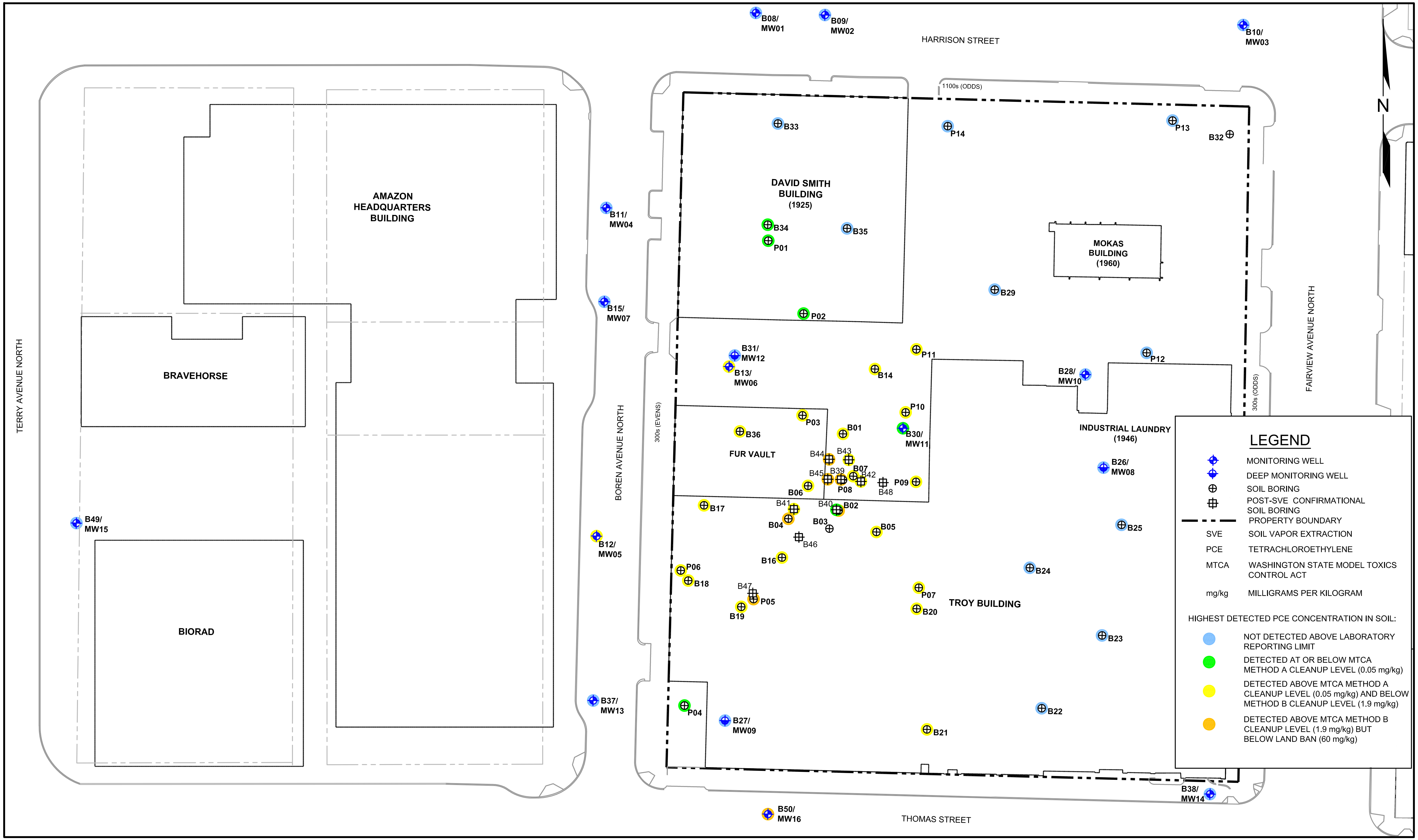

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DATE: 12/12/12
DRAWN BY: NAC/JQC
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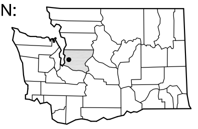
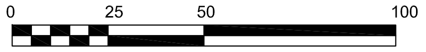
CAD FILE: 0731-004_2013ICAP_SD_PCE

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:

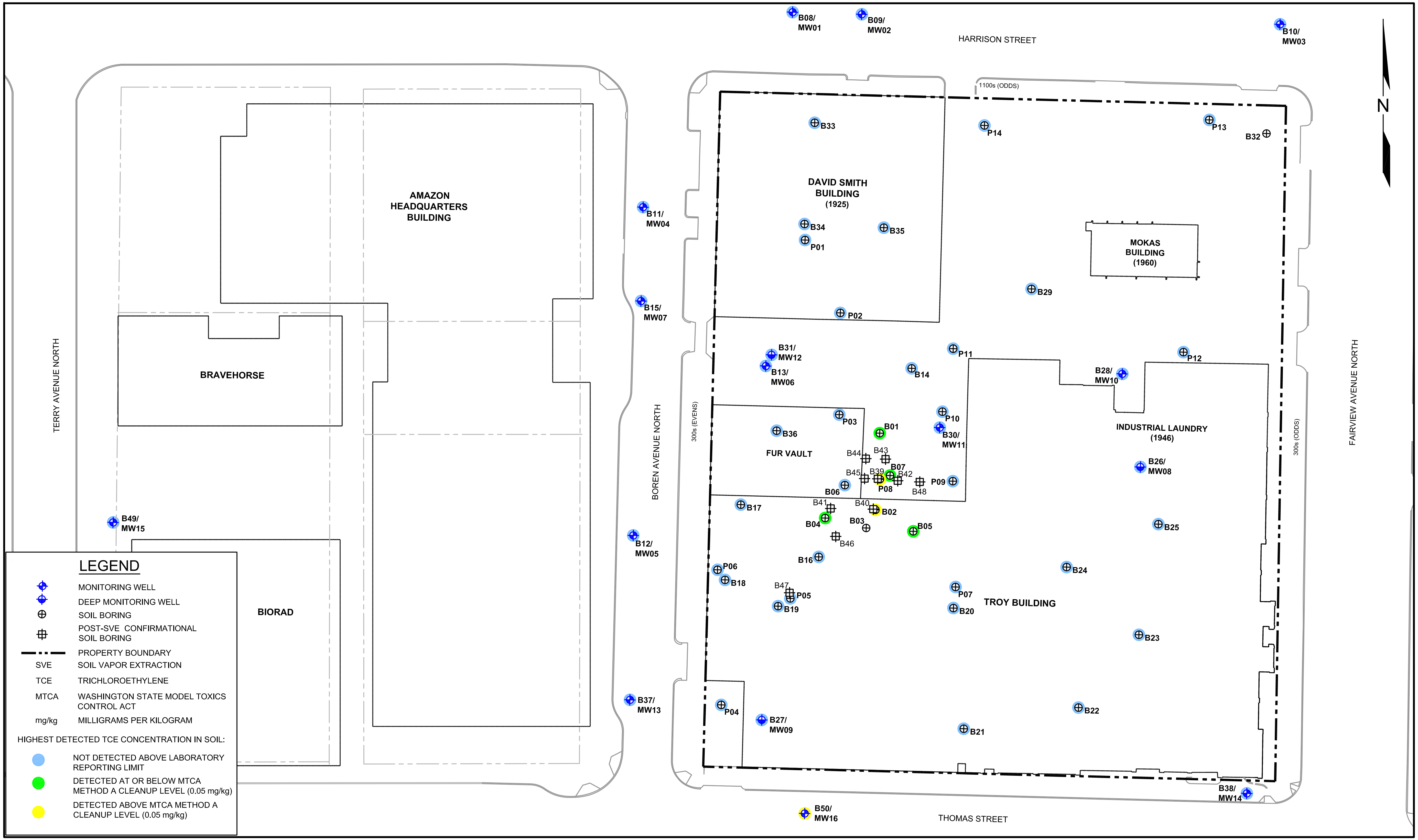




APPROXIMATE SCALE IN FEET

FIGURE 12
SOIL ANALYTICAL RESULTS FOR PCE

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_SD_PCE_F.DWG
1/16/2013



LEGEND

✦	MONITORING WELL
✦	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
SVE	SOIL VAPOR EXTRACTION
TCE	TRICHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM

HIGHEST DETECTED TCE CONCENTRATION IN SOIL:

●	NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
●	DETECTED AT OR BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)
●	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)

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DATE: 12/13/12
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0731-004_2013ICAP_SD_TCE

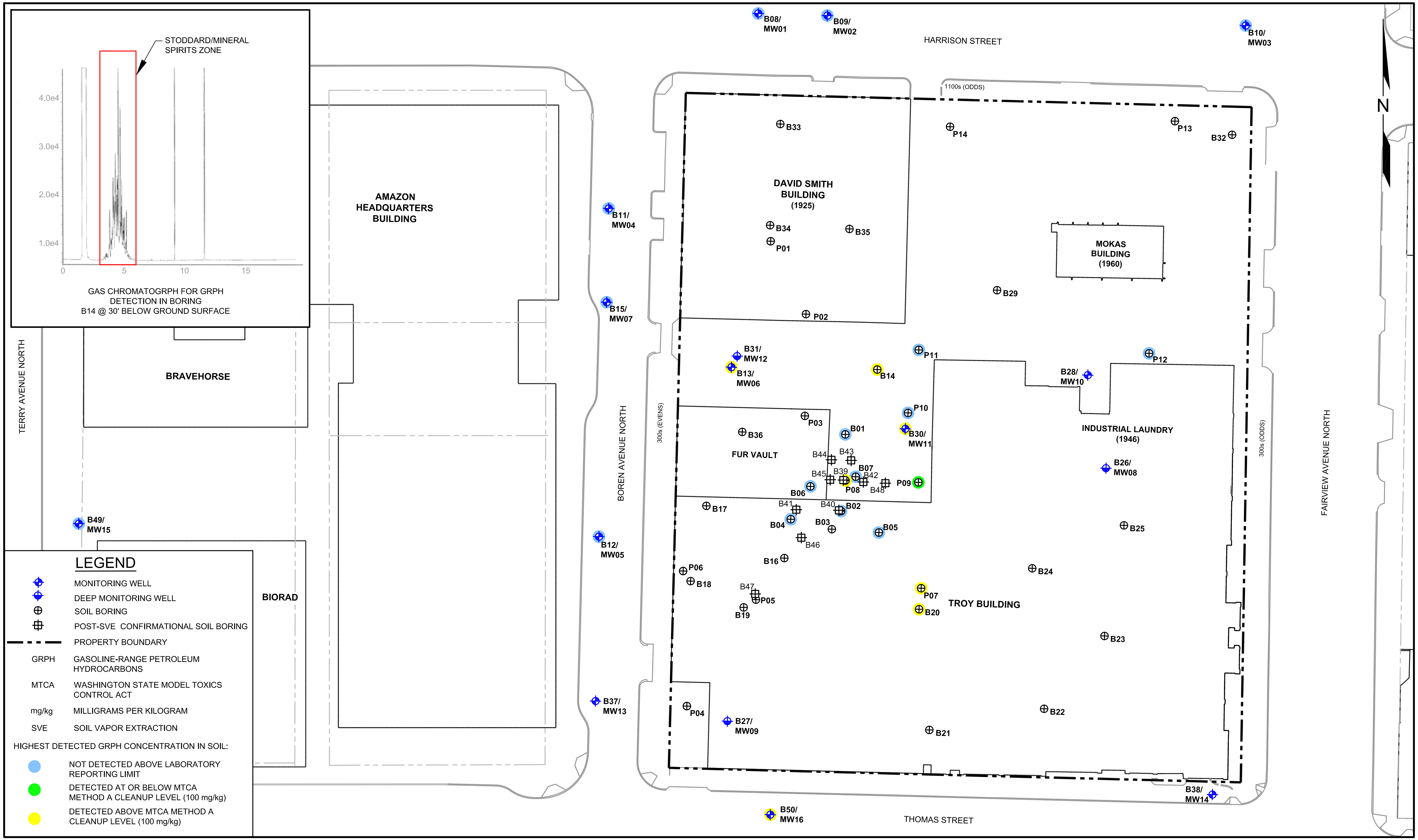
PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 13
SOIL ANALYTICAL RESULTS FOR TCE

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_SD_TCE_F.DWG 1/16/2013



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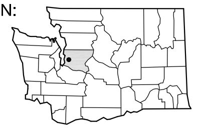
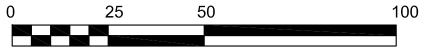
DATE: 12/13/12
DRAWN BY: NAC
CHECKED BY: EKR
CAD FILE: 0731-004_2013ICAP_SD_GRPH

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET

FIGURE 14
SOIL ANALYTICAL RESULTS FOR GRPH AS STODDARD SOLVENTS

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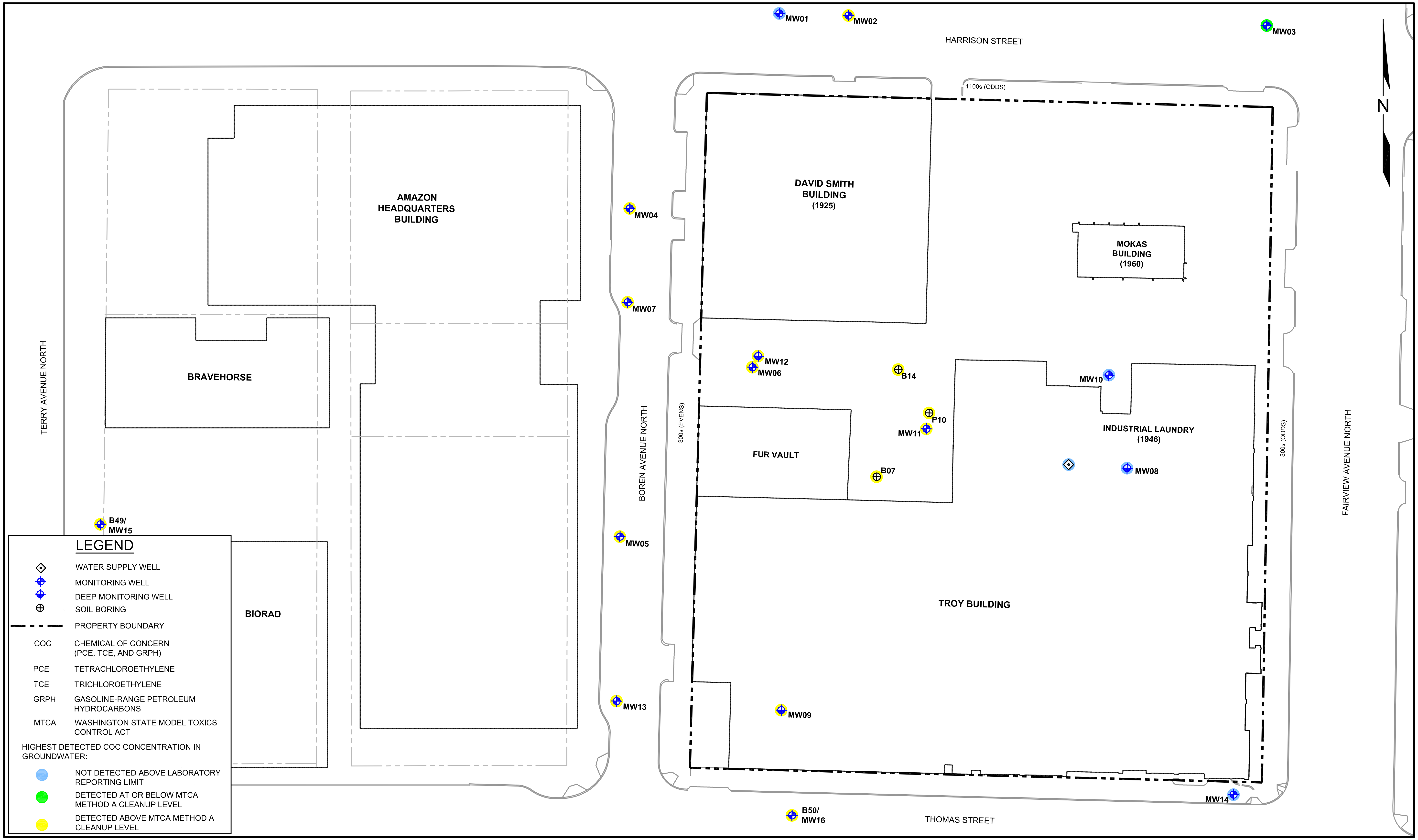

LEGEND

◈	WATER SUPPLY WELL
⊕	MONITORING WELL
⊕	DEEP MONITORING WELL
⊕	SOIL BORING
— · — ·	PROPERTY BOUNDARY
COC	CHEMICAL OF CONCERN (PCE, TCE, AND GRPH)
PCE	TETRACHLOROETHYLENE
TCE	TRICHLOROETHYLENE
GRPH	GASOLINE-RANGE PETROLEUM HYDROCARBONS
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT

HIGHEST DETECTED COC CONCENTRATION IN GROUNDWATER:

🔵	NOT DETECTED ABOVE LABORATORY REPORTING LIMIT
🟢	DETECTED AT OR BELOW MTCA METHOD A CLEANUP LEVEL
🟡	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL

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CAD FILE: 0731-004_2013ICAP_GD

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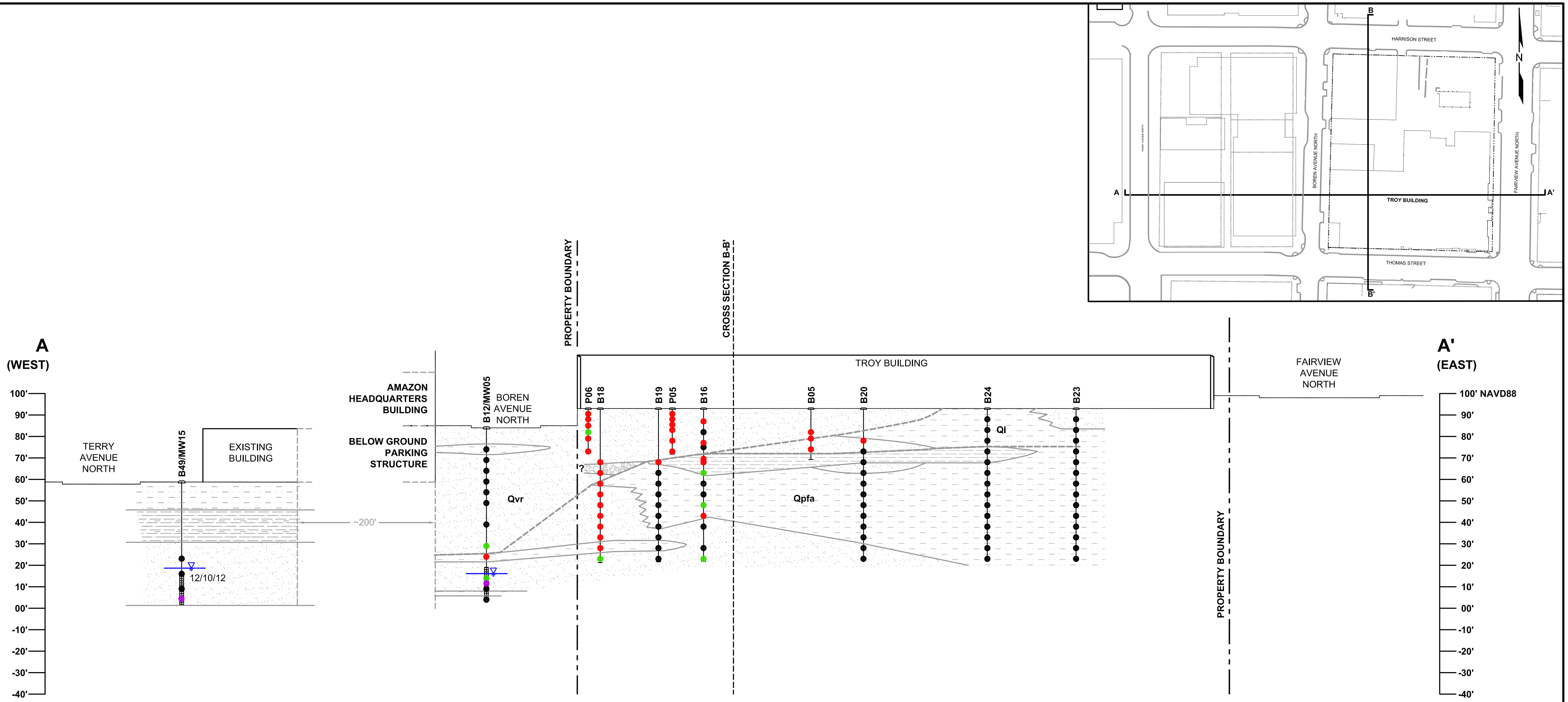
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 15
GROUNDWATER ANALYTICAL RESULTS FOR PCE, TCE, AND GRPH

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_GD_F.DWG
1/16/2013



LEGEND

MONITORING WELL
SCREEN INTERVAL
GROUNDWATER LEVEL (OCTOBER 20, 2011)

TCE	TRICHLOROETHYLENE
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
µg/L	MICROGRAMS PER LITER

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS):

▨	SP AND SP-SM
▨	SM
▨	ML AND SM
▨	GP
Qvr	VASHON RECESSIONAL OUTWASH DEPOSITS
Qi	ICE-CONTACT DEPOSITS
Qpfa	PRE-FRASER NONGLACIAL DEPOSITS

PCE CONCENTRATIONS IN SOIL (mg/kg):

- ● CONCENTRATION BELOW LABORATORY DETECTION LIMIT
- 🟢 CONCENTRATION AT OR BELOW MTCA METHOD A CLEANUP LEVEL
- 🔴 CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

HIGHEST PCE/TCE CONCENTRATIONS IN GROUNDWATER (µg/L):

- 🔵 CONCENTRATION BELOW MTCA METHOD A CLEANUP LEVEL
- 🟣 CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

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DATE: 12/13/12
DRAWN BY: NAC
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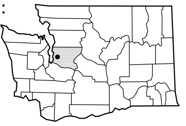
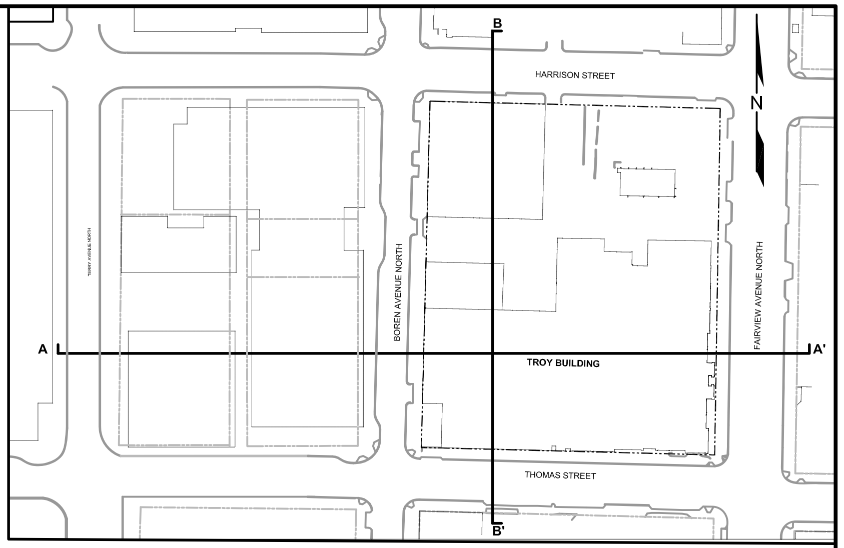
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

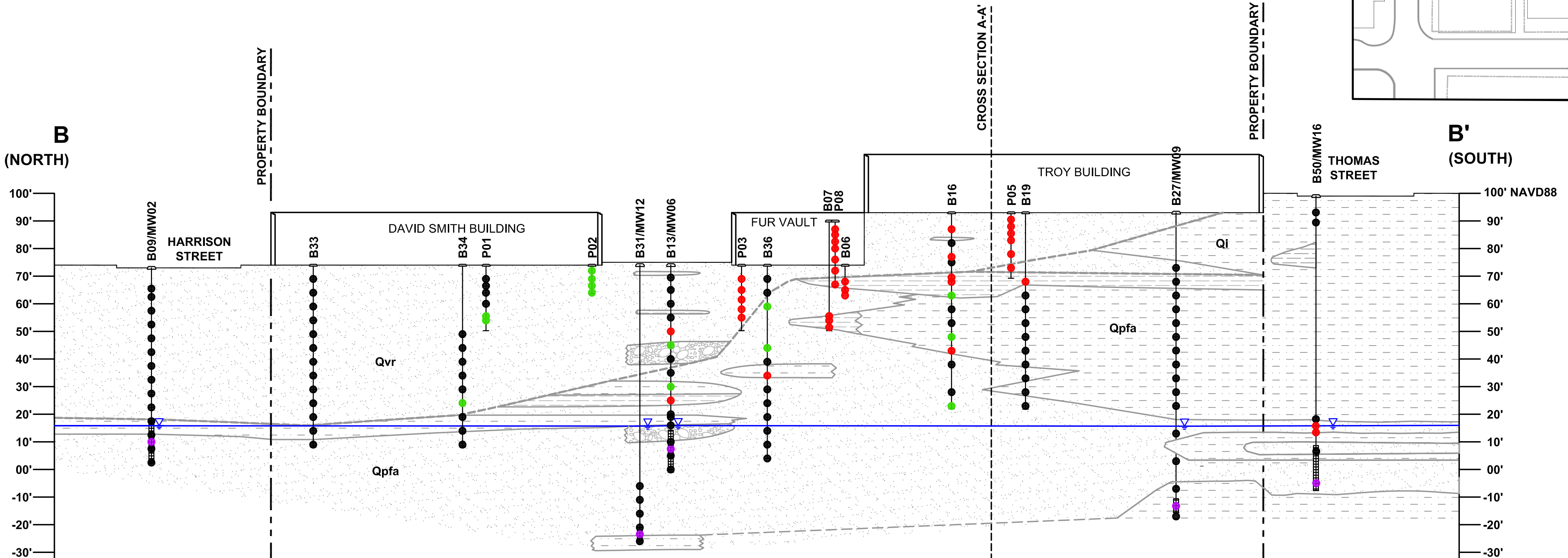
REGION:



0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 16
CROSS SECTION A-A'
CHLORINATED SOLVENTS IN SOIL AND GROUNDWATER





LEGEND

MONITORING WELL
SCREEN INTERVAL
GROUNDWATER LEVEL (OCTOBER 20, 2011)

TCE	TRICHLOROETHYLENE
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
µg/L	MICROGRAMS PER LITER

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS):

▨	SP AND SP-SM
▨	SM
▨	ML AND SM
▨	GP
Qvr	VASHON RECESSIONAL OUTWASH DEPOSITS
Qi	ICE-CONTACT DEPOSITS
Qpfa	PRE-FRASER NONGLACIAL DEPOSITS

PCE CONCENTRATIONS IN SOIL (mg/kg):

- ● CONCENTRATION BELOW LABORATORY DETECTION LIMIT
- ● CONCENTRATION AT OR BELOW MTCA METHOD A CLEANUP LEVEL
- ● CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

HIGHEST PCE/TCE CONCENTRATIONS IN GROUNDWATER (µg/L):

- ● CONCENTRATION BELOW MTCA METHOD A CLEANUP LEVEL
- ● CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

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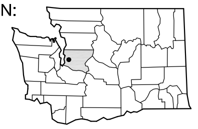
PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

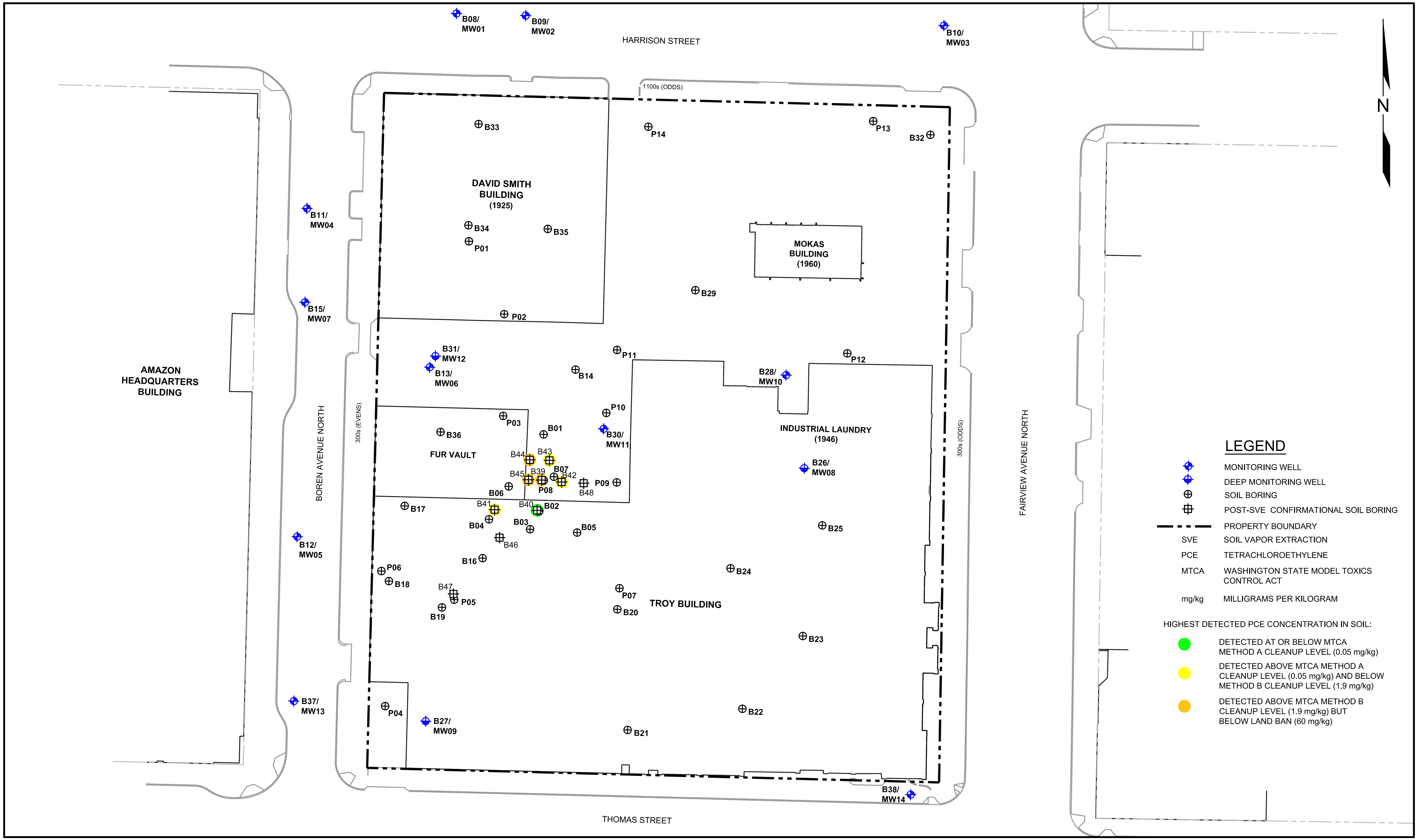
REGION:



0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 17

CROSS SECTION B-B'
CHLORINATED SOLVENTS IN SOIL AND GROUNDWATER



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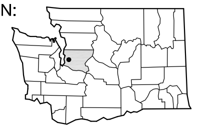
DATE: 02/08/12
DRAWN BY: BLR
CHECKED BY: EKR
CAD FILE: 0731-004_2013ICAP_PSVE

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:

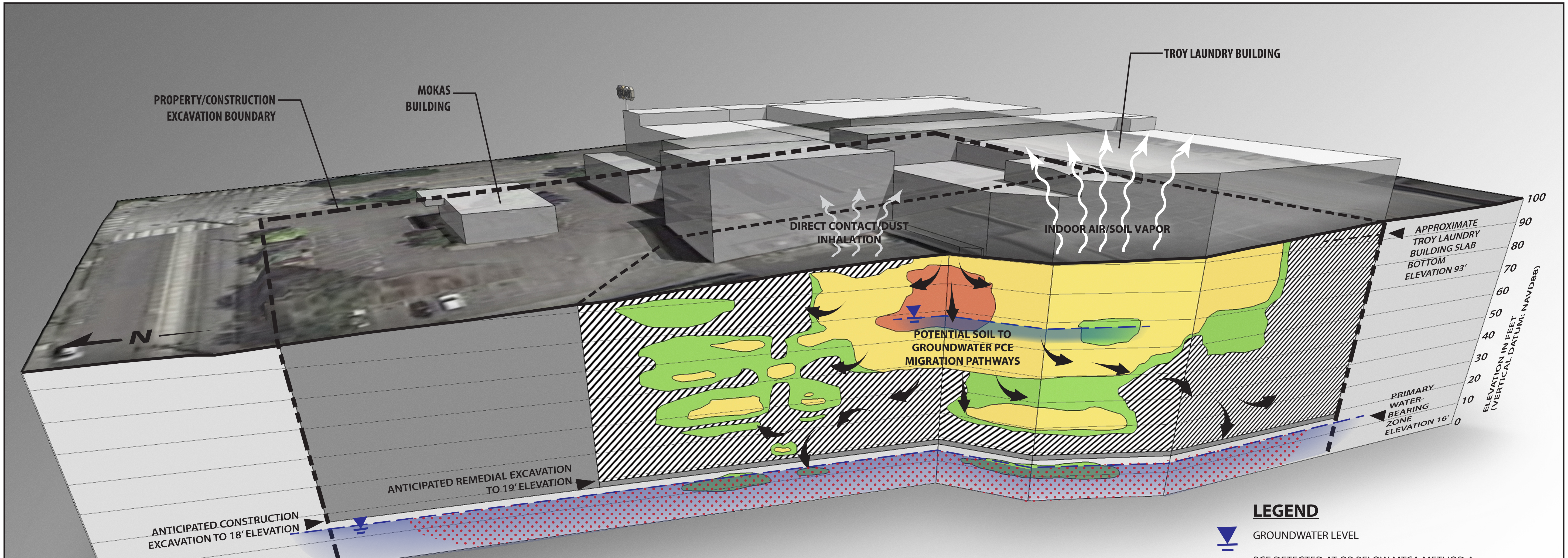


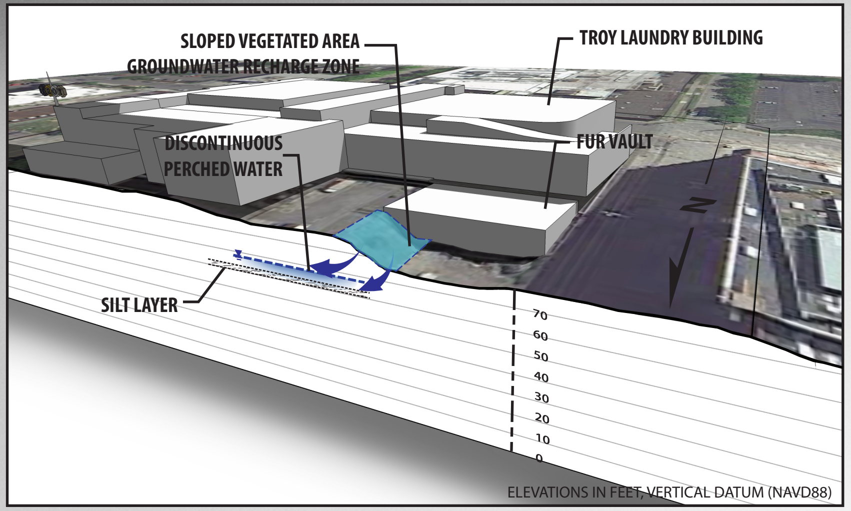
0 25 50 100

APPROXIMATE SCALE IN FEET

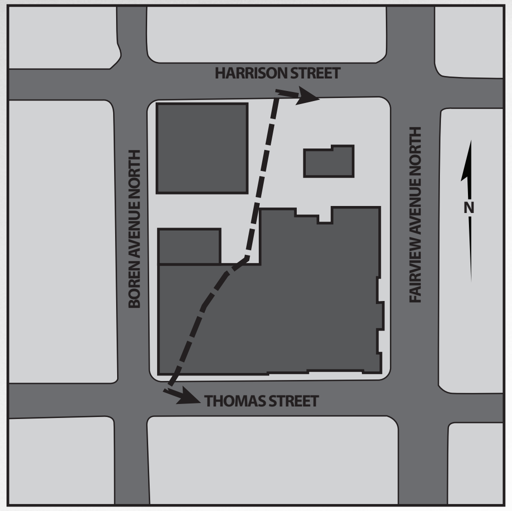
FIGURE 18

POST-SVE CONFIRMATIONAL SOIL ANALYTICAL RESULTS FOR PCE





GROUNDWATER INFILTRATION DIAGRAM



CROSS SECTION LOCATION

LEGEND

▼	GROUNDWATER LEVEL
🟩	PCE DETECTED AT OR BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND ABOVE LABRATORY REPORTING LIMIT
🟨	PCE DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)
🟧	PCE DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) AND BELOW LAND BAN (60 mg/kg)
🟦	PRIMARY WATER-BEARING ZONE
⁘	PCE CONTAMINATION IN GROUNDWATER
PCE	TETRACHLOROETHYLENE
mg/kg	MILLIGRAMS PER KILOGRAM

*VERTICAL DATUM: NAVD88
*SURFACE ELEVATIONS FROM OCTOBER, 2011 SURVEY

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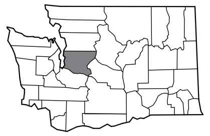
DATE: 12/2/11
DRAWN BY: VPB
CHECKED BY: EKR
FILE: 0731-001_2012iCAP_CSM

PROJECT NAME: TROY LAUNDRY PROPERTY
SES PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

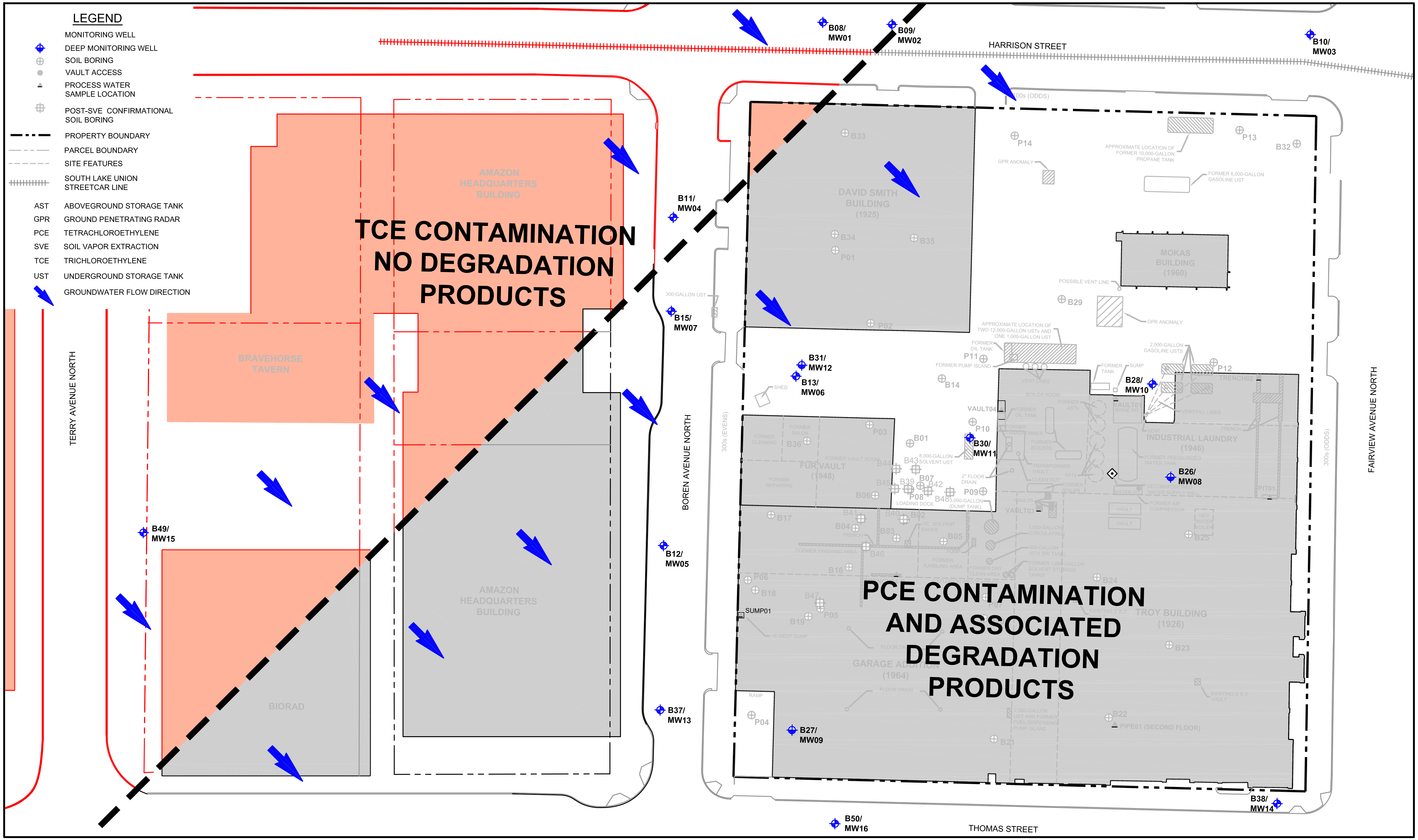
REGION:



NOT TO SCALE

FIGURE 19

CONCEPTUAL SITE MODEL SHOWING
PCE-CONTAMINATED SOIL AND GROUNDWATER



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CAD FILE: 0731-004_2013CAP_TCEVSPCE

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

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0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 20
SOLVENT PLUME SOURCE TYPE

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004 2013ICAP HISTORICAL-SOURCE F.DWG 1/16/2013

LEGEND

- PROPERTY BOUNDARY
- PARCEL BOUNDARY
- BUILDINGS
- 🟥 POTENTIAL CONTRIBUTING SOURCE TO TCE PLUME, BASED ON HISTORICAL SITE USAGE AS CALLED OUT IN SANBORN FIRE INSURANCE MAPS
- TCE TRICHLOROETHYLENE
- ↘ MEASURED GROUNDWATER FLOW DIRECTION

N

WIDESPREAD INDUSTRIAL USE OF TCE BEGAN IN THE 1920S

TCE PRODUCTION HISTORY (U.S.)

1930s	15 MILLION POUNDS/YEAR
1940s	50 MILLION POUNDS/YEAR
1950s	350 MILLION POUNDS/YEAR
1960s	600 MILLION POUNDS/YEAR
1970s	400 MILLION POUNDS/YEAR
1980	REGULATED AS A HAZARDOUS WASTE
2000	100 MILLION POUNDS/YEAR

*IN THE 1950s, MORE THAN 90% OF TCE IN THE UNITED STATES WAS USED FOR METAL DEGREASING

REFERENCE: AUGUST MACK ENVIRONMENTAL, THE HISTORY OF TCE USE, 2011

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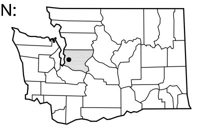
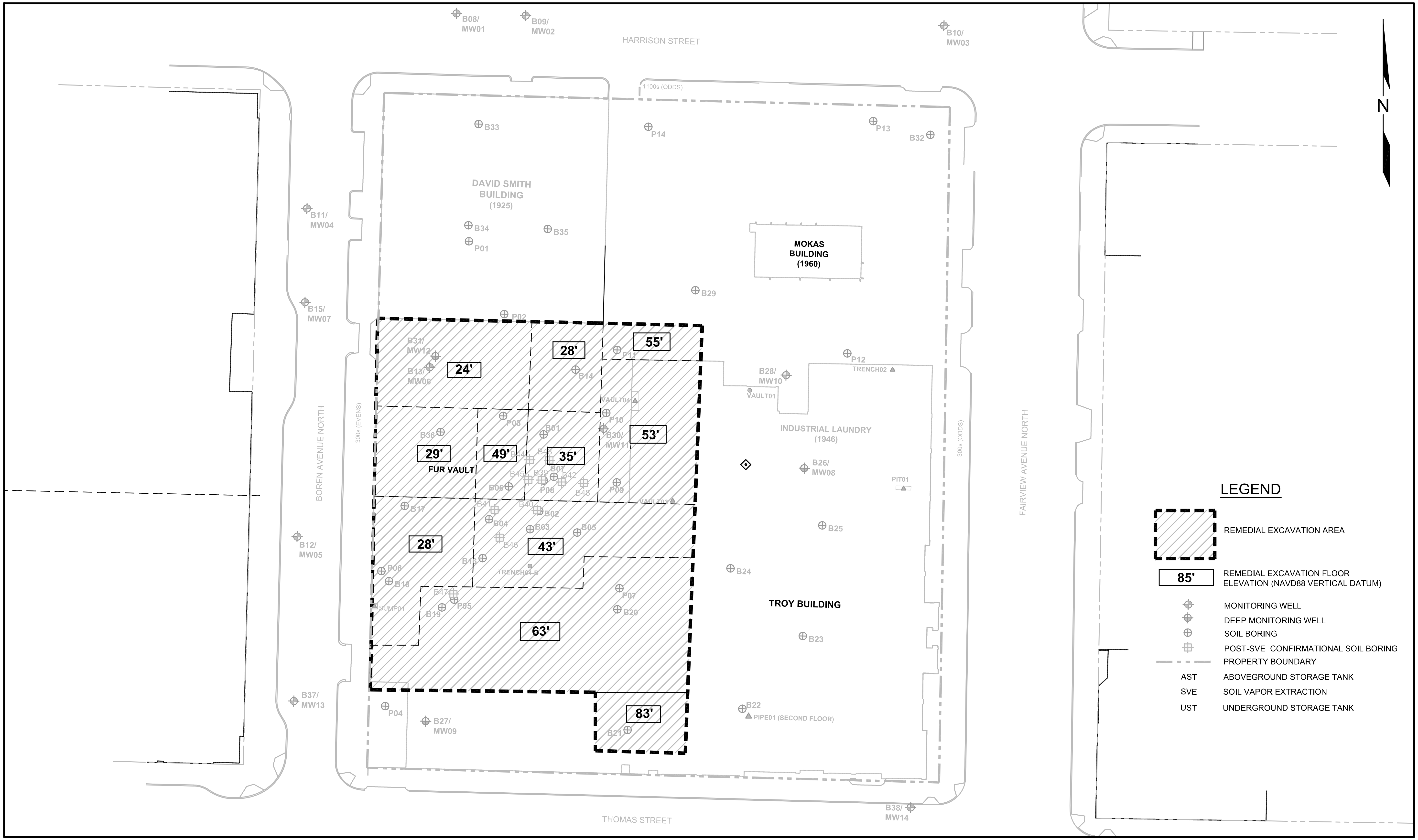


0 75 150 300
APPROXIMATE SCALE IN FEET

FIGURE 21

POTENTIAL CONTRIBUTORS TO SOLVENT CONTAMINATION

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_EXC-PLAN_MTCA_F.DWG 1/17/2013



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CAD FILE: 0731-004_2013ICAP_EXC-PLAN_MTCA

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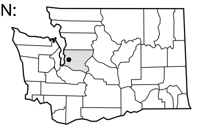

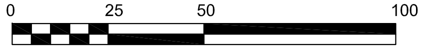

APPROXIMATE SCALE IN FEET

FIGURE 22

ESTIMATED REMEDIAL EXCAVATION DIAGRAM (BASED ON MTCA METHOD A EXCEEDANCES FOR PCE)

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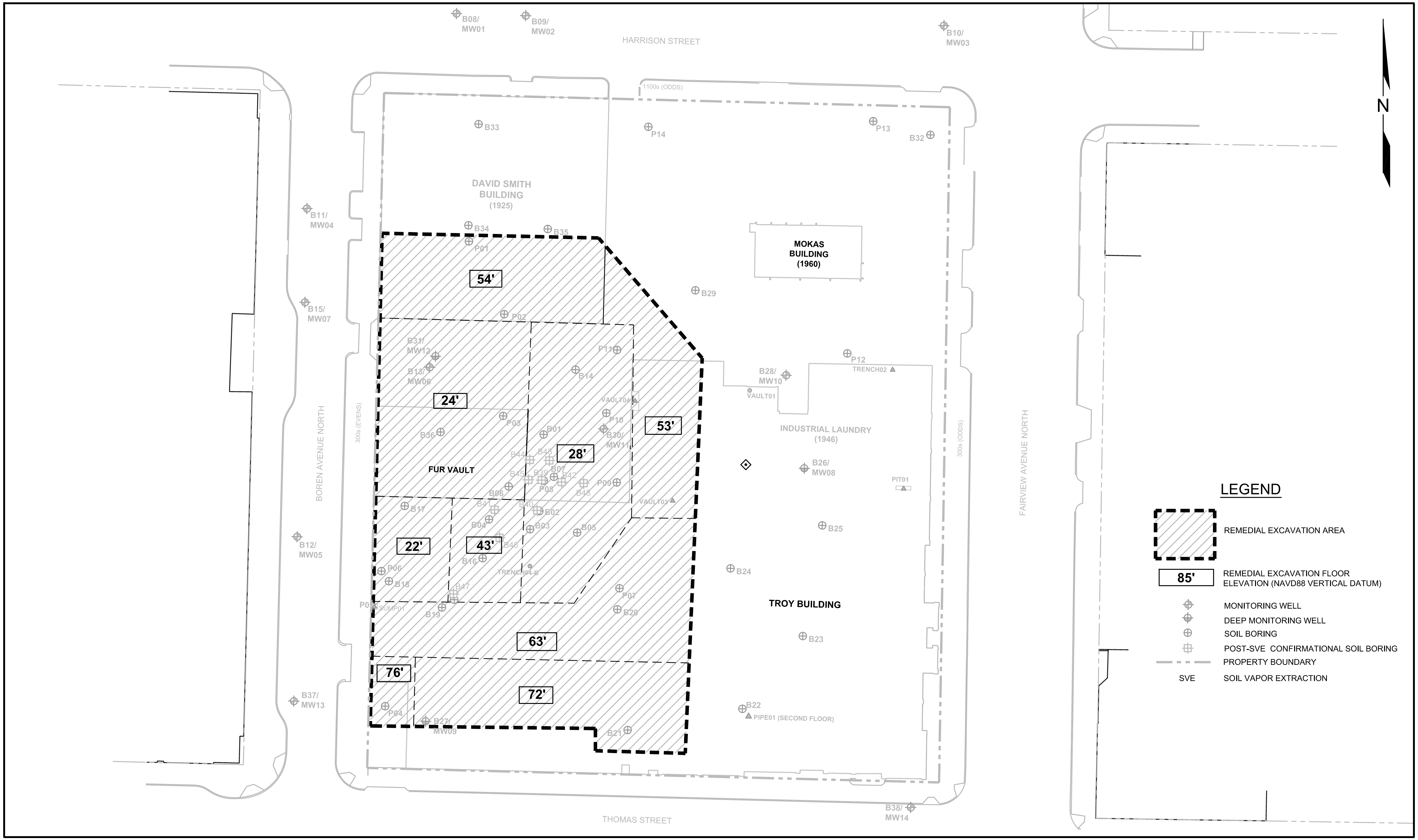
P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_EXC-PLAN_F.DWG



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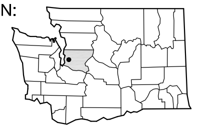

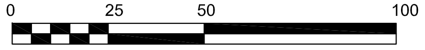

APPROXIMATE SCALE IN FEET

FIGURE 23

ESTIMATED REMEDIAL EXCAVATION DIAGRAM (BASED ON LABORATORY LIMIT EXCEEDANCES FOR PCE)

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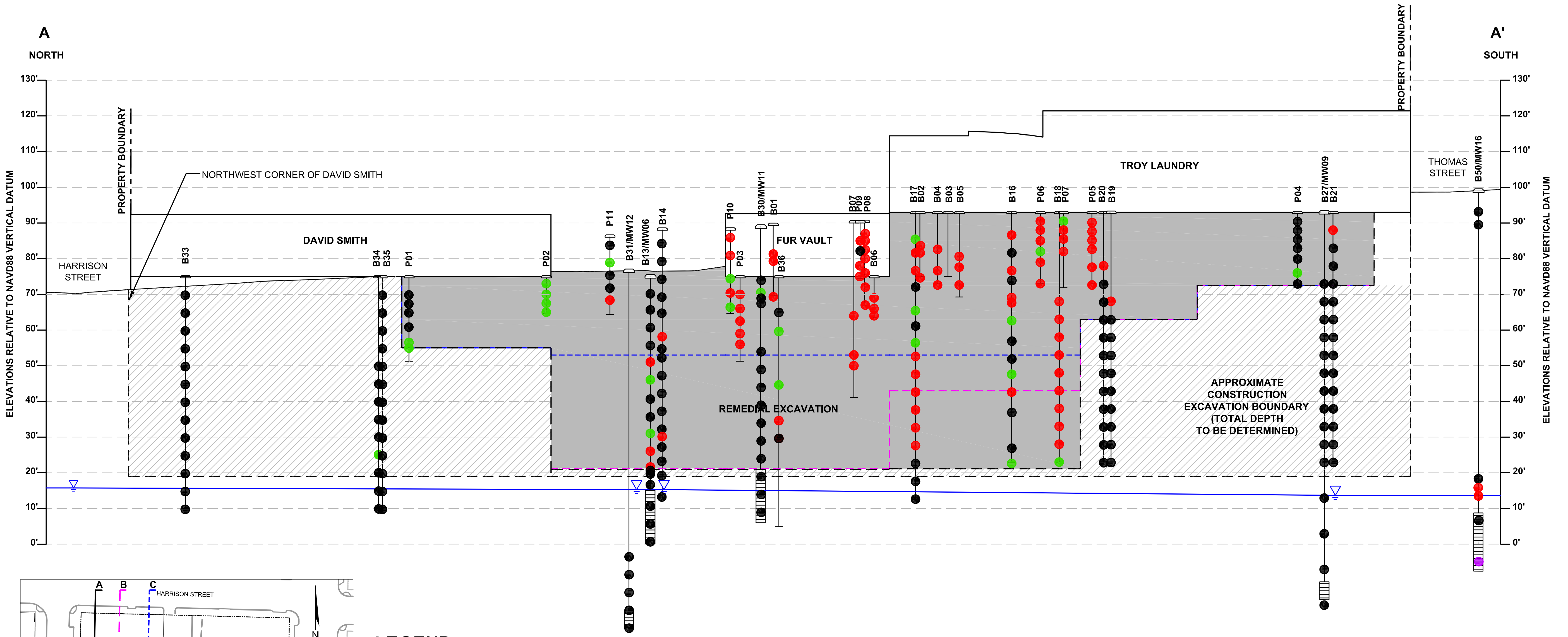

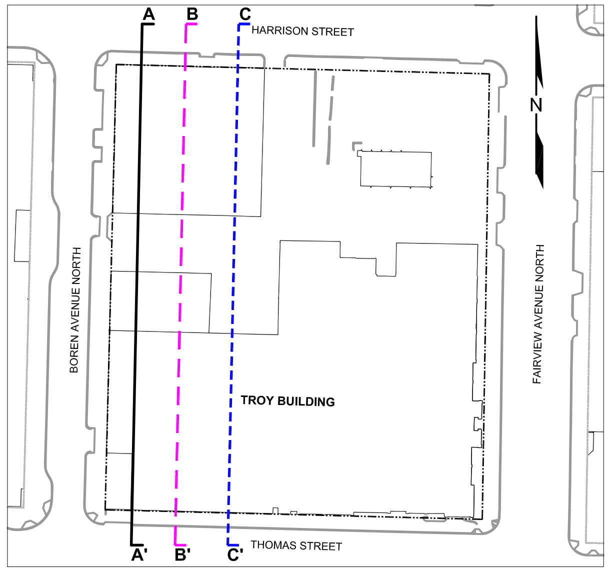

PLAN VIEW

LEGEND

▨ REMEDIAL EXCAVATION

▨ APPROXIMATE EXTENT OF CONSTRUCTION EXCAVATION

— GROUNDWATER LEVEL

– – – EXCAVATION EXTENT

PCE CONCENTRATIONS IN SOIL (mg/kg):

● CONCENTRATION BELOW MTCA METHOD A CLEANUP LEVEL

🟢 CONCENTRATION AT OR BELOW MTCA METHOD A CLEANUP LEVEL

🔴 CONCENTRATION ABOVE MTCA METHOD A CLEANUP LEVEL

mg/kg	MILLIGRAMS PER KILOGRAM
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT

VERTICAL DATUM: NAVD88

MW11 (21' E) WELL OFFSET 21' EAST

BLANK CASING

WATER TABLE

WELL SCREEN INTERVAL

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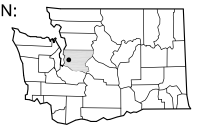
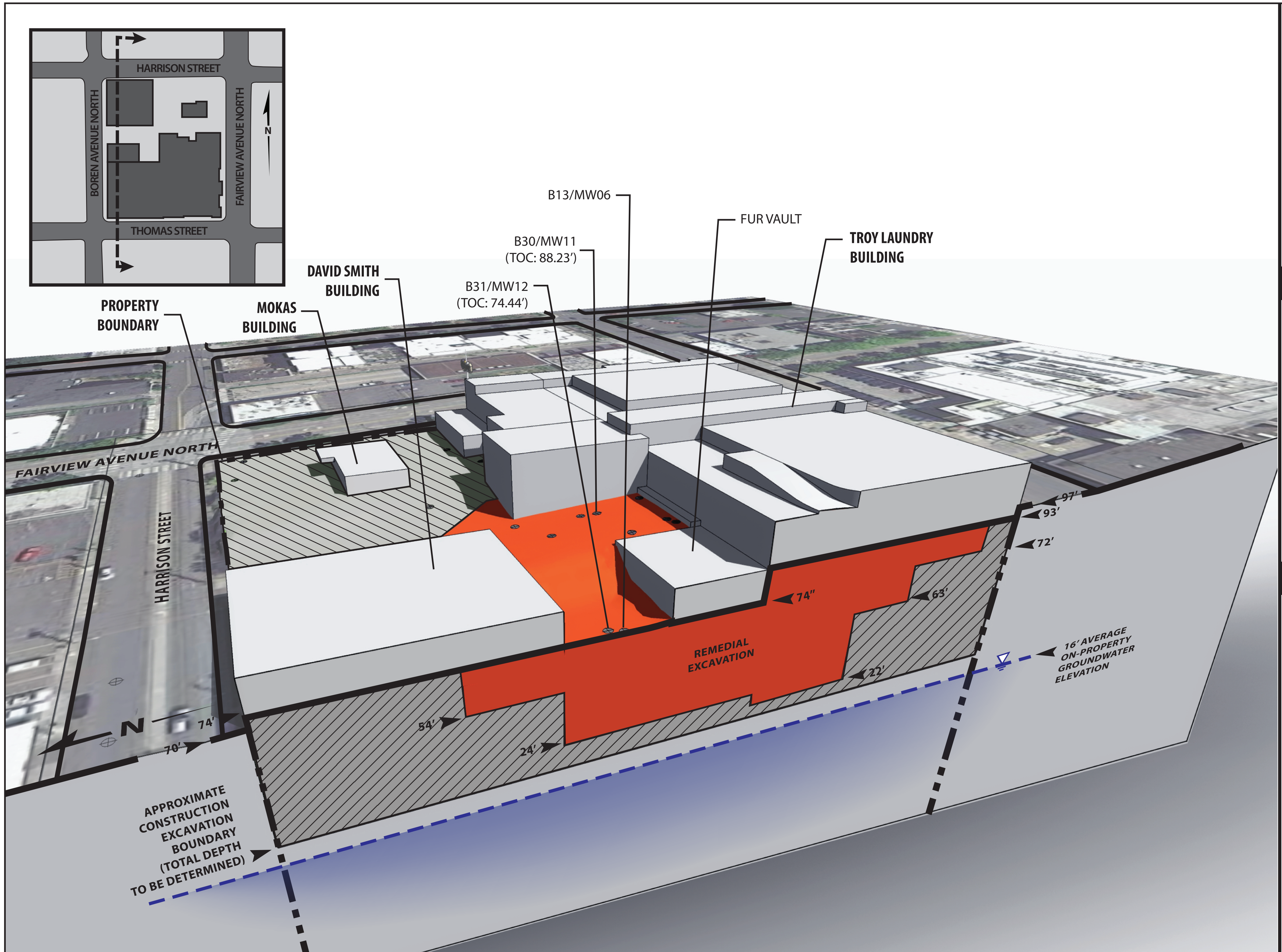


0 15 30 60
APPROXIMATE SCALE IN FEET

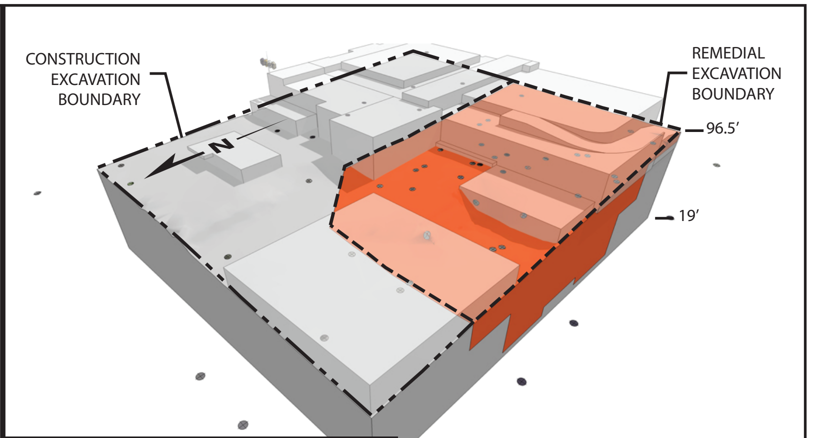
FIGURE 24

REMEDIAL EXCAVATION CROSS SECTIONS
BASED ON DETECTABLE
CONCENTRATIONS OF PCE

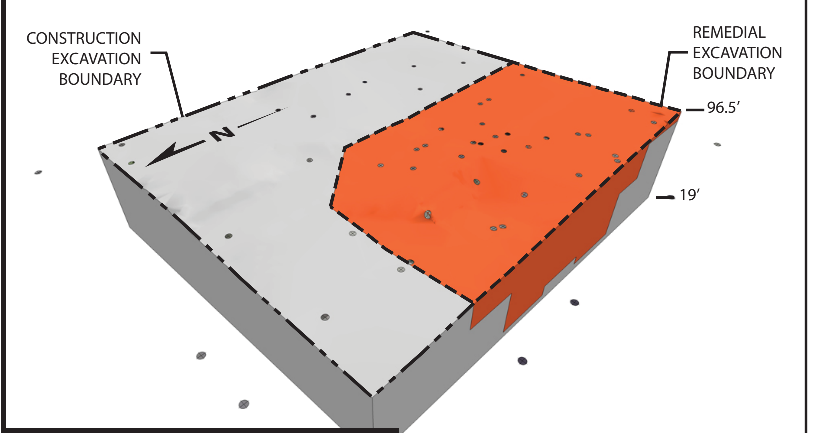


VERTICAL DATUM: NAVD88

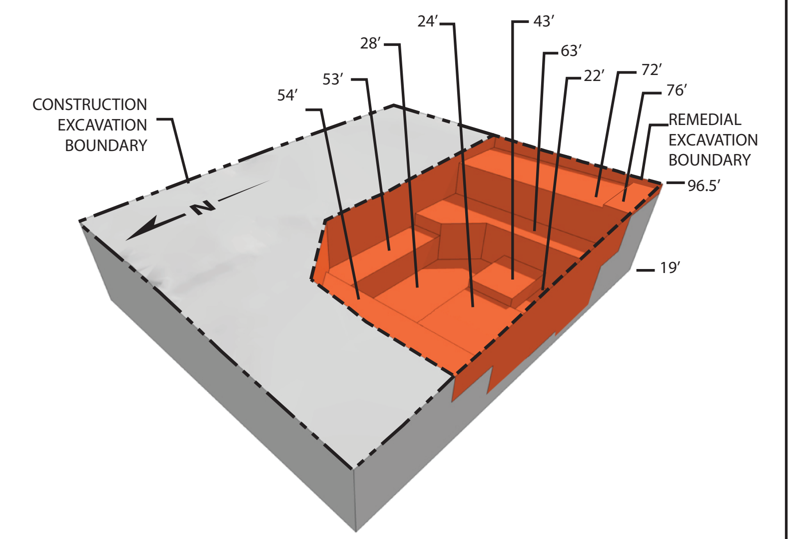
MW11 AND MW12 SHOW TOP OF CASING (TOC) ELEVATIONS TO ILLUSTRATE THE ELEVATION DIFFERENCE BETWEEN THE TWO POINTS (~13.8')



PRESENT LAND USE VIEW



POST-DEMOLITION VIEW



VERTICAL DATUM: NAVD88

ESTIMATED REMEDIAL/CONSTRUCTION EXCAVATION ELEVATIONS

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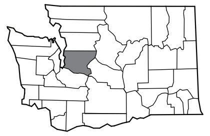
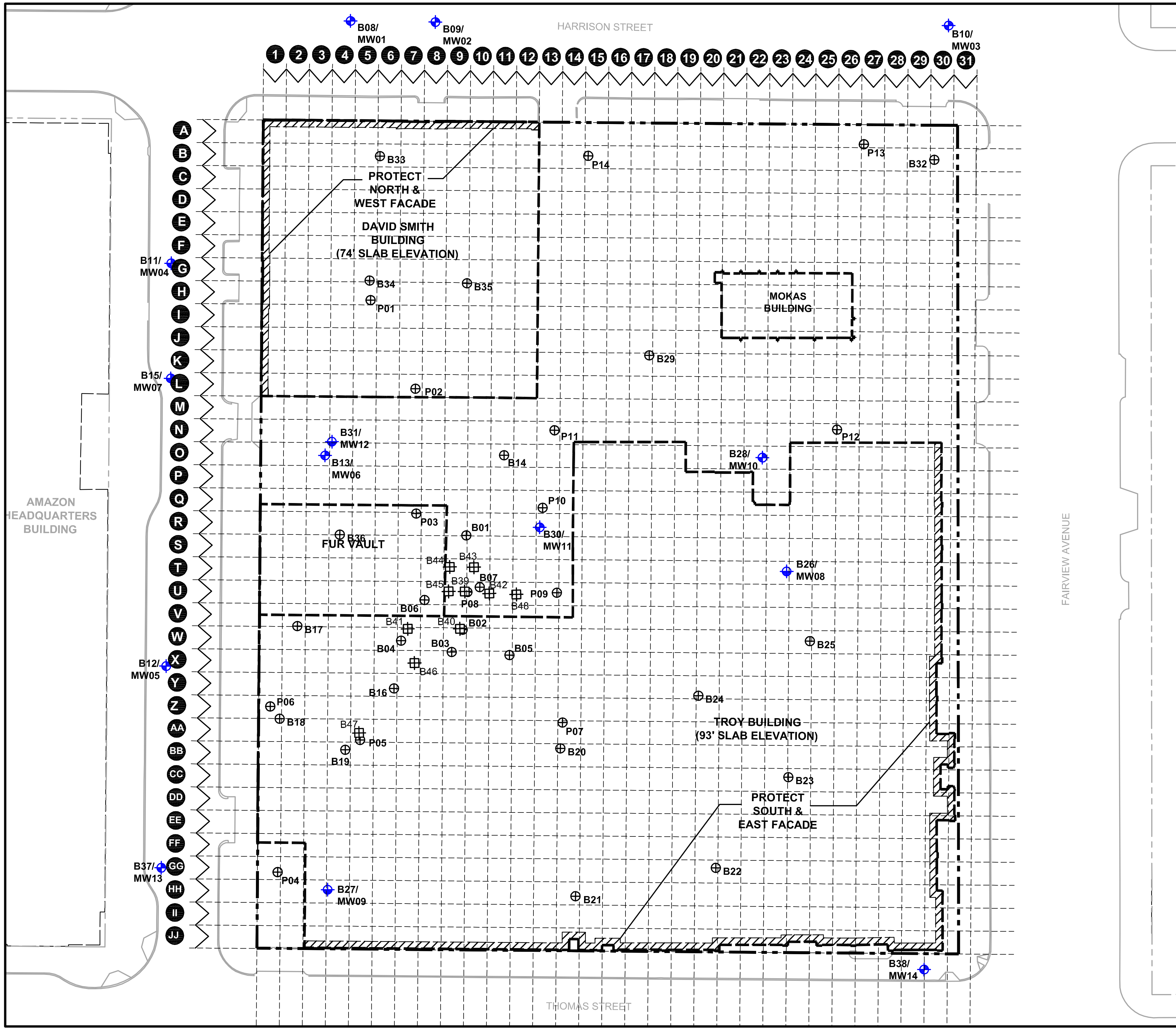


NOT TO SCALE

FIGURE 25

3D VIEW OF ESTIMATED EXCAVATION PLAN BASED ON DETECTABLE CONCENTRATIONS OF PCE

1/16/2013



N

LEGEND

⊕	MONITORING WELL
⊕	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
① A ⟩ A1	SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 01
(105' - 100' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	0 FT³	0 CY
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	0 FT³	0 CY
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	0 FT³	0 CY
🟦	10' BUFFER ZONE	0 FT³	0 CY

- - -	MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*
- - -	MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*
- - -	MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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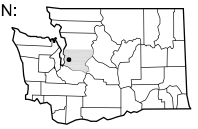

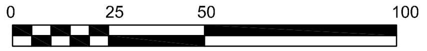

APPROXIMATE SCALE IN FEET

FIGURE 26A
SOIL MANAGEMENT GRID
LAYER - 01 (105' - 100')

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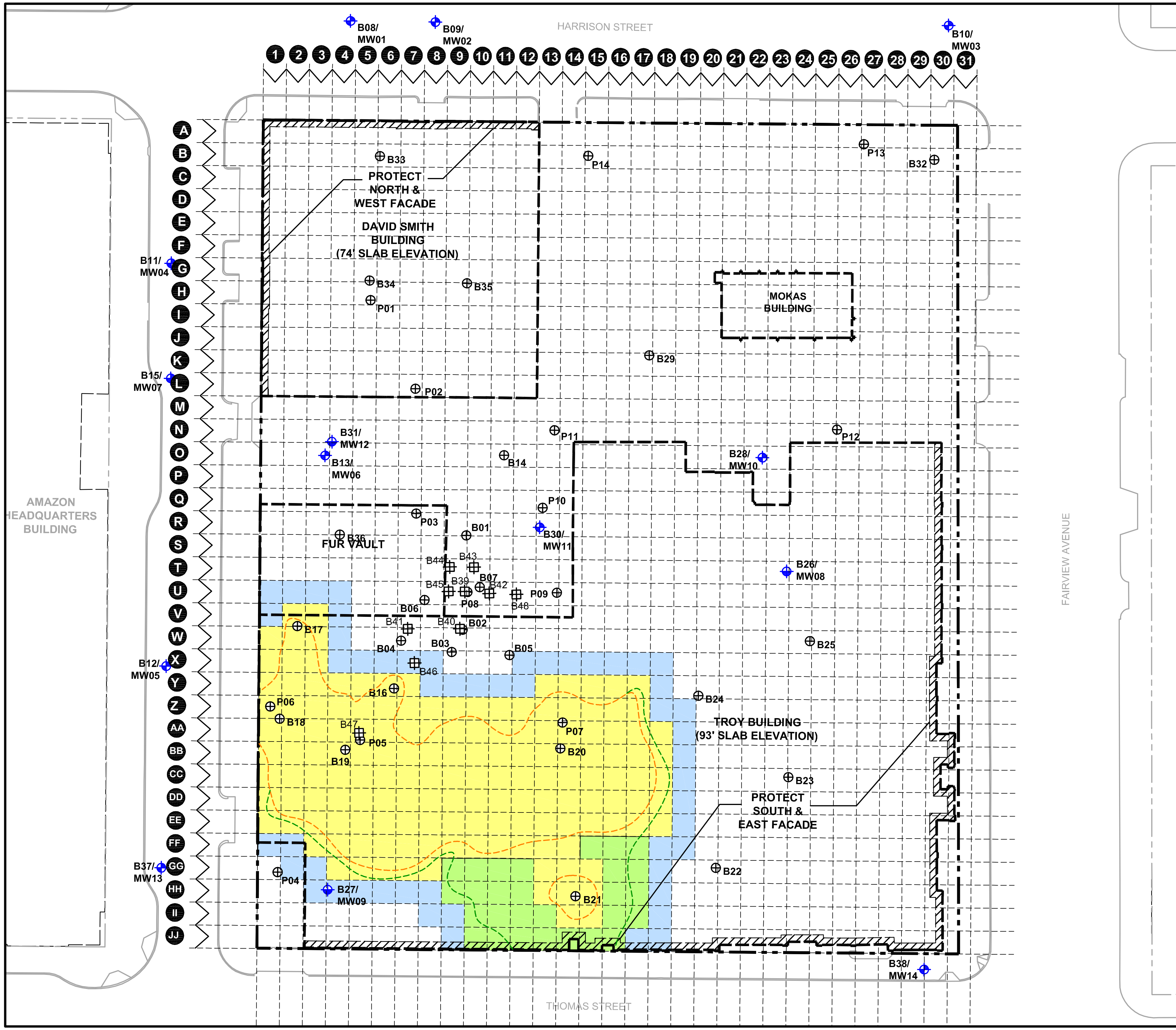

LEGEND

✦	MONITORING WELL
✦	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
① Ⓐ A1	SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 02
(100' - 90' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	**28,000 FT³**	**1,037 CY**
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	**152,000 FT³**	**5,630 CY**
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	**0 FT³**	**0 CY**
🟦	10' BUFFER ZONE	**52,000 FT³**	**1,926 CY**

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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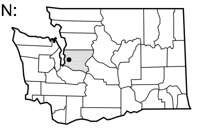

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 26B
SOIL MANAGEMENT GRID
LAYER - 02 (100' - 90')

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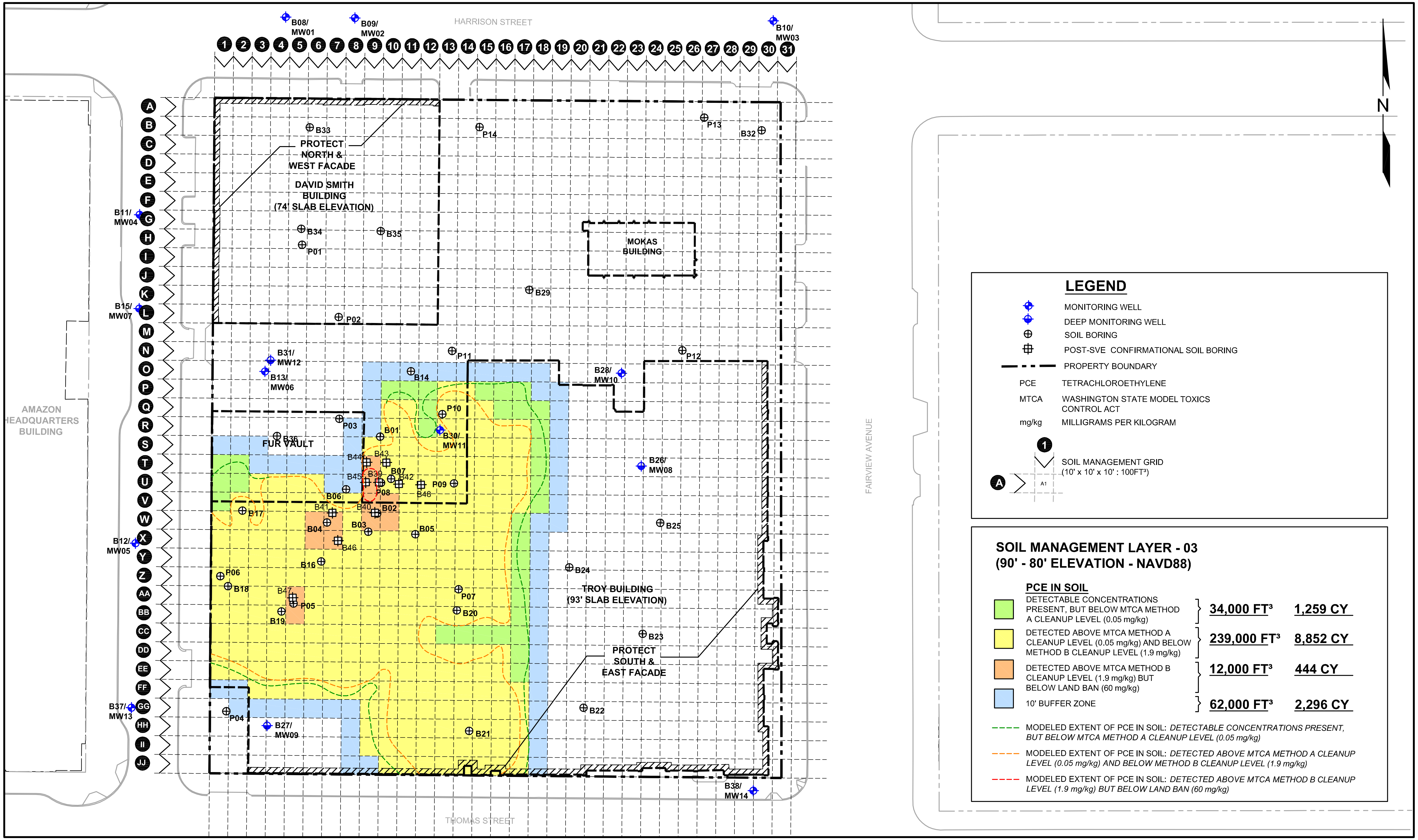

LEGEND

✛	MONITORING WELL
✛	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
① Ⓐ A1	SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 03
(90' - 80' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	34,000 FT³	1,259 CY
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	239,000 FT³	8,852 CY
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	12,000 FT³	444 CY
🟦	10' BUFFER ZONE	62,000 FT³	2,296 CY

- - - MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

- - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

- - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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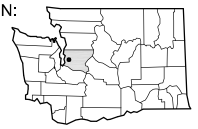

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 26C
SOIL MANAGEMENT GRID
LAYER - 03 (90' - 80')

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1/16/2013

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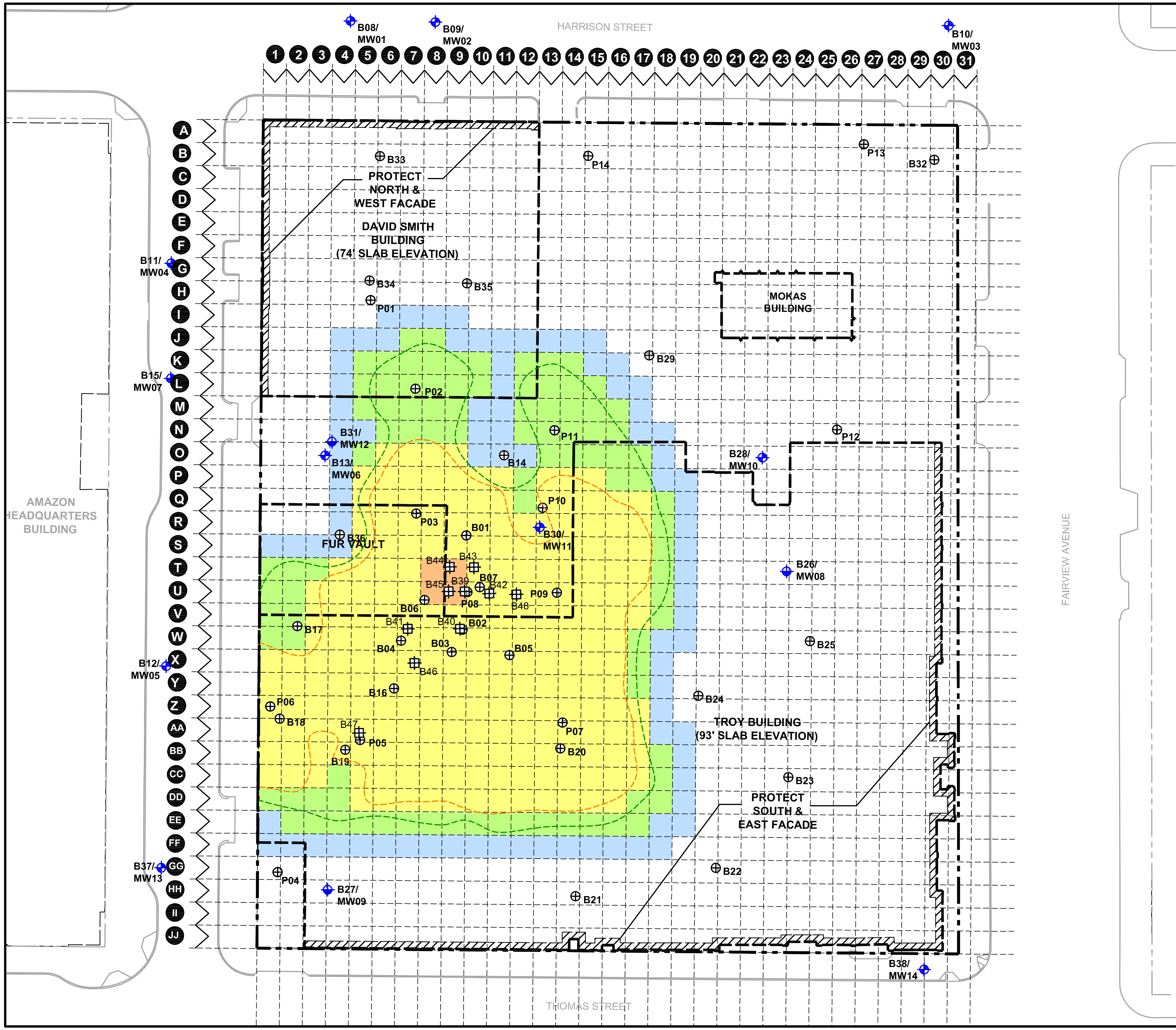

LEGEND

⌖	MONITORING WELL
⌖	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— - - —	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM

SOIL MANAGEMENT GRID
(10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 04
(80' - 70' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	**93,000 FT³**	**3,444 CY**
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	**217,000 FT³**	**8,037 CY**
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	**4,000 FT³**	**148 CY**
🟦	10' BUFFER ZONE	**83,000 FT³**	**3,074 CY**

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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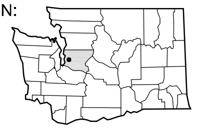

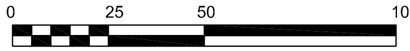

APPROXIMATE SCALE IN FEET

FIGURE 26D
SOIL MANAGEMENT GRID
LAYER - 04 (80' - 70')

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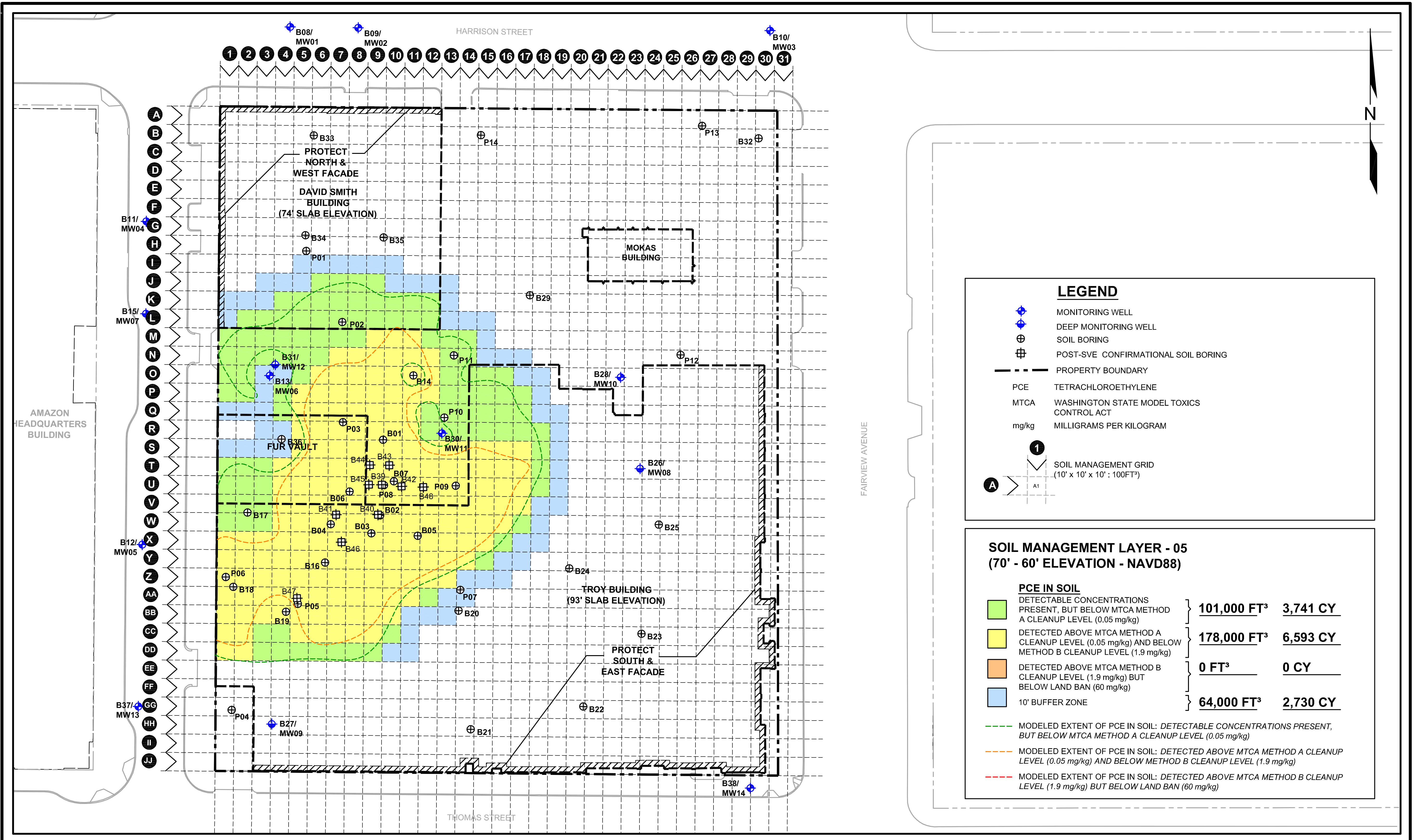

LEGEND

✦ MONITORING WELL

✦ DEEP MONITORING WELL

⊕ SOIL BORING

⊞ POST-SVE CONFIRMATIONAL SOIL BORING

–·–·– PROPERTY BOUNDARY

PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM

1 A A1 SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT^3)

SOIL MANAGEMENT LAYER - 05
(70' - 60' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	**101,000 FT^3**	**3,741 CY**
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	**178,000 FT^3**	**6,593 CY**
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	**0 FT^3**	**0 CY**
🟦	10' BUFFER ZONE	**64,000 FT^3**	**2,730 CY**

---- MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

---- MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

---- MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

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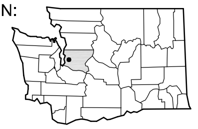

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 26E
SOIL MANAGEMENT GRID
LAYER - 05 (70' - 60')

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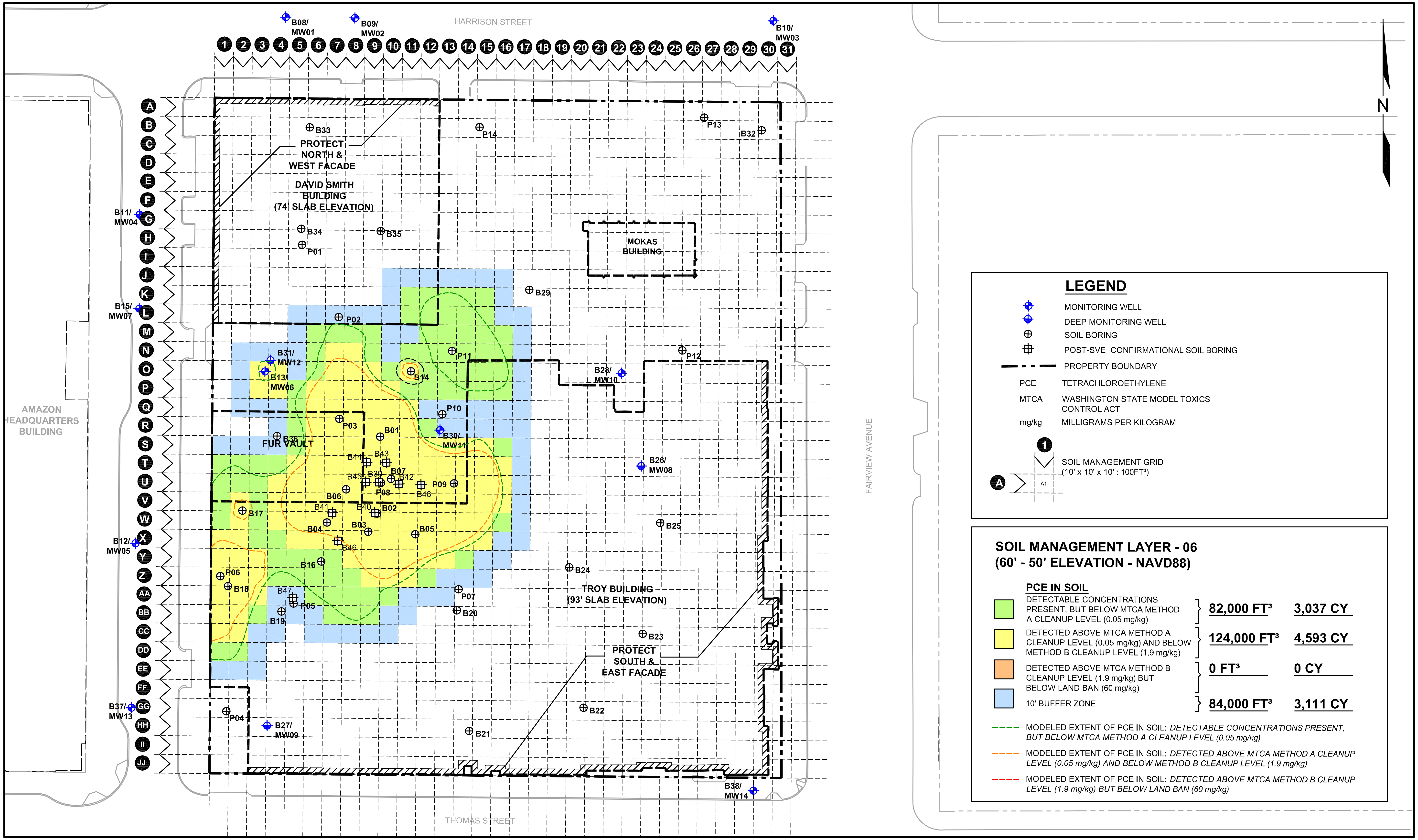

LEGEND

✦	MONITORING WELL
✦	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
1, A, A1	SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 06
(60' - 50' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	**82,000 FT³**	**3,037 CY**
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	**124,000 FT³**	**4,593 CY**
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	**0 FT³**	**0 CY**
🟦	10' BUFFER ZONE	**84,000 FT³**	**3,111 CY**

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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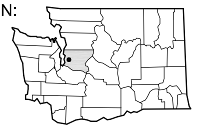
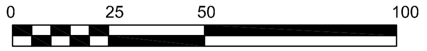
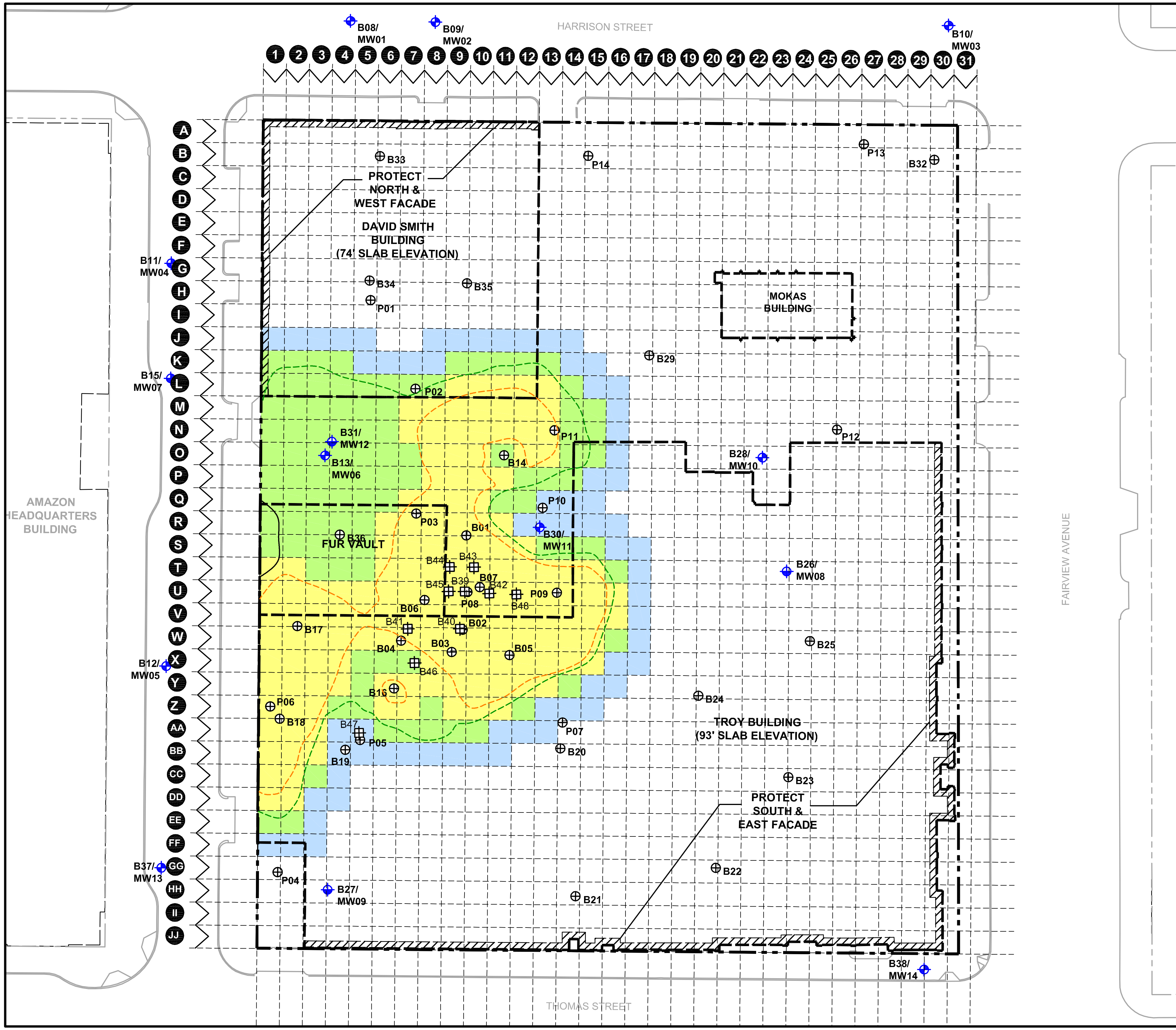




APPROXIMATE SCALE IN FEET

FIGURE 26F
SOIL MANAGEMENT GRID
LAYER - 06 (60' - 50')



LEGEND

⊕	MONITORING WELL
⊕	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
1 / A / A1	SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 07
(50' - 40' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	97,000 FT³	3,593 CY
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	146,000 FT³	5,407 CY
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	0 FT³	0 CY
🟦	10' BUFFER ZONE	66,000 FT³	2,444 CY

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

- - - - MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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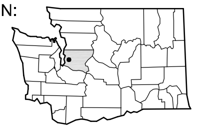

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 26G
SOIL MANAGEMENT GRID
LAYER - 07 (50' - 40')

1/16/2013

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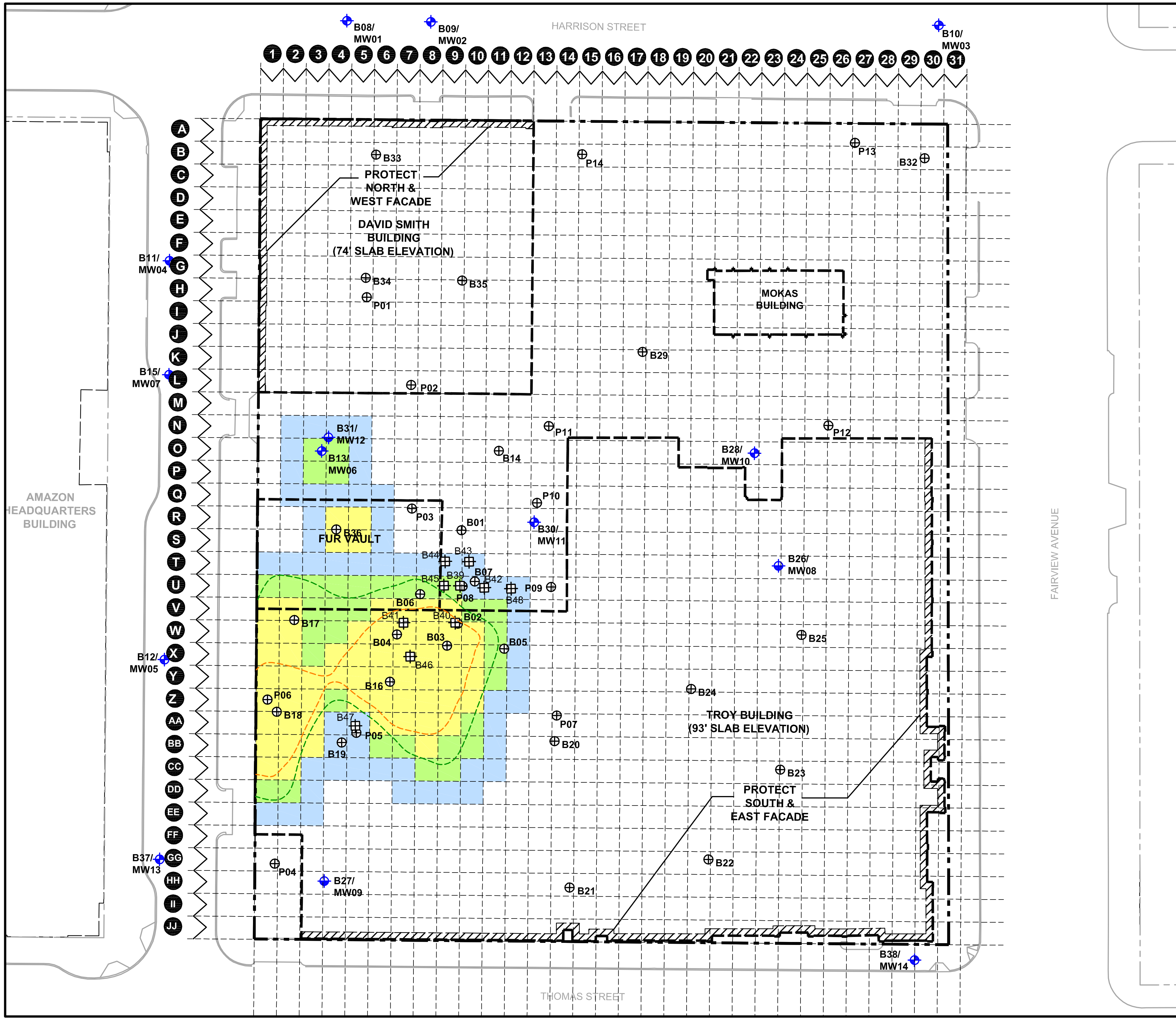

LEGEND

⌖	MONITORING WELL
⌖	DEEP MONITORING WELL
⊕	SOIL BORING
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · — ·	PROPERTY BOUNDARY
PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM
① Ⓐ A1	SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 08
(40' - 30' ELEVATION - NAVD88)

PCE IN SOIL

🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	**34,000 FT³**	**1,259 CY**
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	**59,000 FT³**	**2,185 CY**
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	**0 FT³**	**0 CY**
🟦	10' BUFFER ZONE	**57,000 FT³**	**2,111 CY**

- - - -	MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*
- - - -	MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*
- - - -	MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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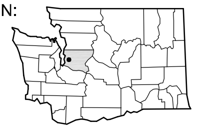

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 26H
SOIL MANAGEMENT GRID
LAYER - 08 (40' - 30')

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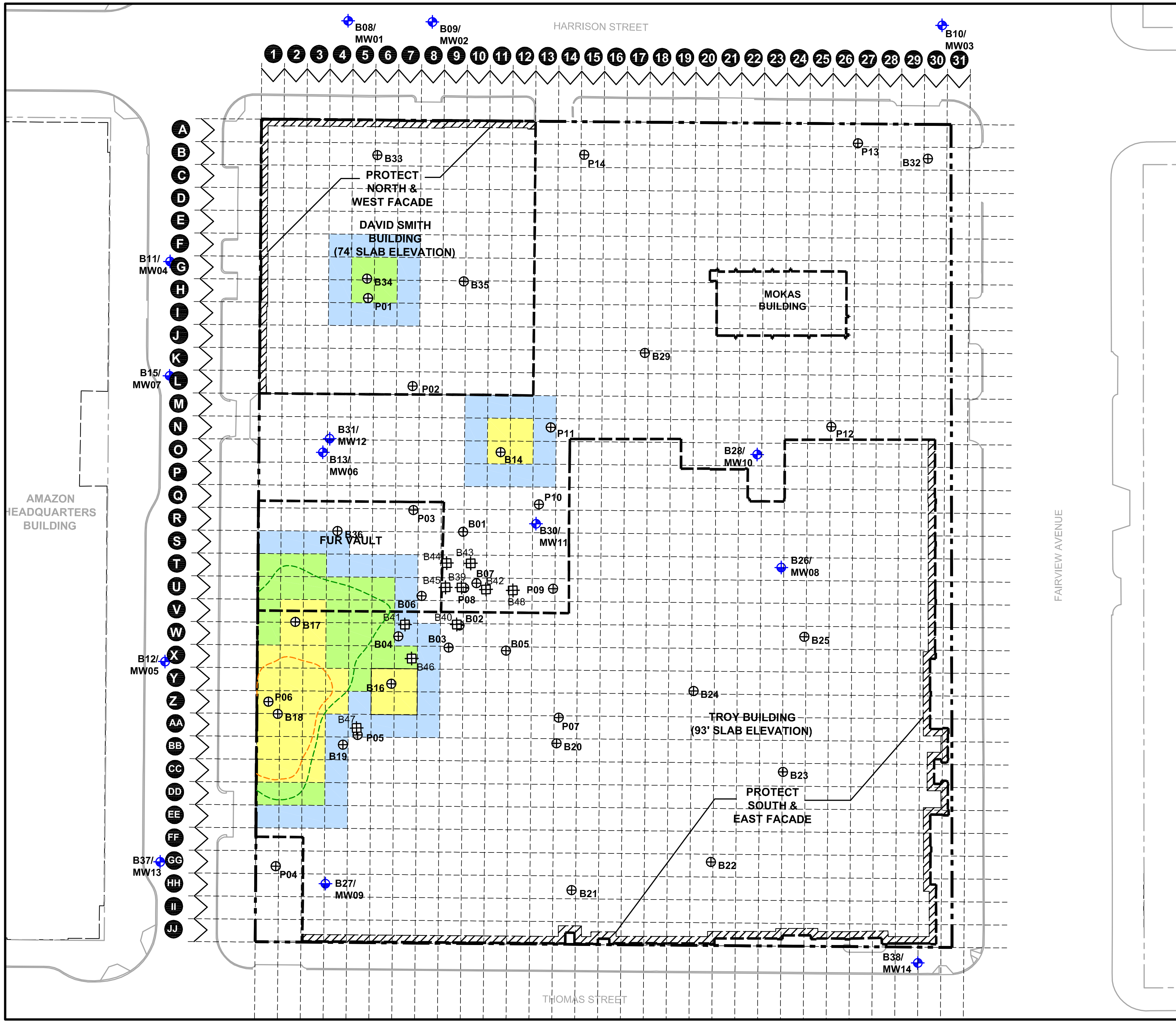

LEGEND

⌖ MONITORING WELL

⌖ DEEP MONITORING WELL

⊕ SOIL BORING

⊞ POST-SVE CONFIRMATIONAL SOIL BORING

–·– PROPERTY BOUNDARY

PCE	TETRACHLOROETHYLENE
MTCA	WASHINGTON STATE MODEL TOXICS CONTROL ACT
mg/kg	MILLIGRAMS PER KILOGRAM

SOIL MANAGEMENT GRID (10' x 10' x 10' : 100FT³)

SOIL MANAGEMENT LAYER - 09 (30' - 20' ELEVATION - NAVD88)

	PCE IN SOIL		
🟩	DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)	29,000 FT³	1,074 CY
🟨	DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)	32,000 FT³	1,185 CY
🟧	DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)	0 FT³	0 CY
🟦	10' BUFFER ZONE	52,000 FT³	1,925 CY

--- MODELED EXTENT OF PCE IN SOIL: *DETECTABLE CONCENTRATIONS PRESENT, BUT BELOW MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg)*

--- MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD A CLEANUP LEVEL (0.05 mg/kg) AND BELOW METHOD B CLEANUP LEVEL (1.9 mg/kg)*

--- MODELED EXTENT OF PCE IN SOIL: *DETECTED ABOVE MTCA METHOD B CLEANUP LEVEL (1.9 mg/kg) BUT BELOW LAND BAN (60 mg/kg)*

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CITY,STATE: SEATTLE, WASHINGTON

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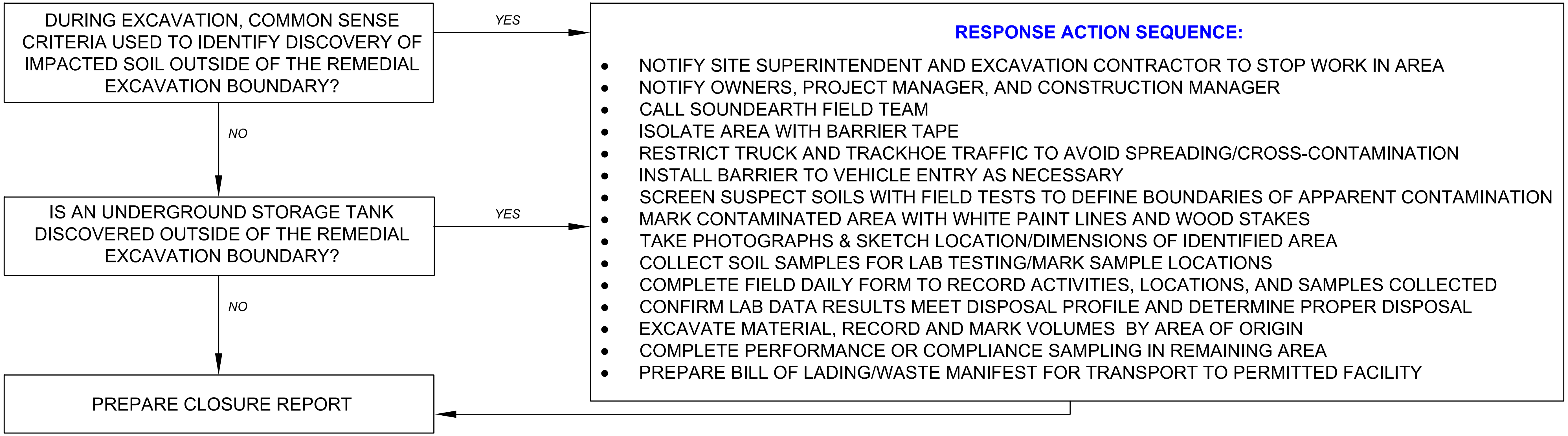
0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 26I
SOIL MANAGEMENT GRID
LAYER - 09 (30' - 20')

DECISION TREE FOR RESPONSE ACTION AND NOTIFICATION PROCEDURE



DURING EXCAVATION, COMMON SENSE CRITERIA USED TO IDENTIFY DISCOVERY OF IMPACTED SOIL OUTSIDE OF THE REMEDIAL EXCAVATION BOUNDARY?

IS AN UNDERGROUND STORAGE TANK DISCOVERED OUTSIDE OF THE REMEDIAL EXCAVATION BOUNDARY?

PREPARE CLOSURE REPORT

RESPONSE ACTION SEQUENCE:

- NOTIFY SITE SUPERINTENDENT AND EXCAVATION CONTRACTOR TO STOP WORK IN AREA
- NOTIFY OWNERS, PROJECT MANAGER, AND CONSTRUCTION MANAGER
- CALL SOUNDEARTH FIELD TEAM
- ISOLATE AREA WITH BARRIER TAPE
- RESTRICT TRUCK AND TRACKHOE TRAFFIC TO AVOID SPREADING/CROSS-CONTAMINATION
- INSTALL BARRIER TO VEHICLE ENTRY AS NECESSARY
- SCREEN SUSPECT SOILS WITH FIELD TESTS TO DEFINE BOUNDARIES OF APPARENT CONTAMINATION
- MARK CONTAMINATED AREA WITH WHITE PAINT LINES AND WOOD STAKES
- TAKE PHOTOGRAPHS & SKETCH LOCATION/DIMENSIONS OF IDENTIFIED AREA
- COLLECT SOIL SAMPLES FOR LAB TESTING/MARK SAMPLE LOCATIONS
- COMPLETE FIELD DAILY FORM TO RECORD ACTIVITIES, LOCATIONS, AND SAMPLES COLLECTED
- CONFIRM LAB DATA RESULTS MEET DISPOSAL PROFILE AND DETERMINE PROPER DISPOSAL
- EXCAVATE MATERIAL, RECORD AND MARK VOLUMES BY AREA OF ORIGIN
- COMPLETE PERFORMANCE OR COMPLIANCE SAMPLING IN REMAINING AREA
- PREPARE BILL OF LADING/WASTE MANIFEST FOR TRANSPORT TO PERMITTED FACILITY

DEVELOPMENT TEAM CONTACT INFO:

• SHAWN PARRY, TOUCHSTONE	OFFICE: 206-727-2393
• SITE SUPERINTENDANT: JEFF CLEATOR, LEASE CRUTCHER LEWIS	OFFICE: 206-689-0493

SOUNDEARTH FIELD TEAM CONTACT INFO:

• ERIN ROTHMAN, PM	CELL: 206-795-0978
• CHRIS CASS, FIELD	CELL: 425-765-4490

- SOUNDEARTH STRATEGIES, INC., MAIN NUMBER: 206-306-1900

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PROJECT NUMBER: 0731-004
STREET ADDRESS: 7800 GILLMAN STREET
CITY, STATE: REDMOND, WASHINGTON

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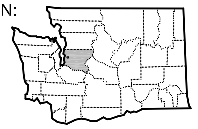

0 5 10 20 40
APPROXIMATE SCALE IN FEET 1" = 20'

FIGURE 27
COMMUNICATION PLAN

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_COMM_F.DWG 1/16/2013

1/16/2013

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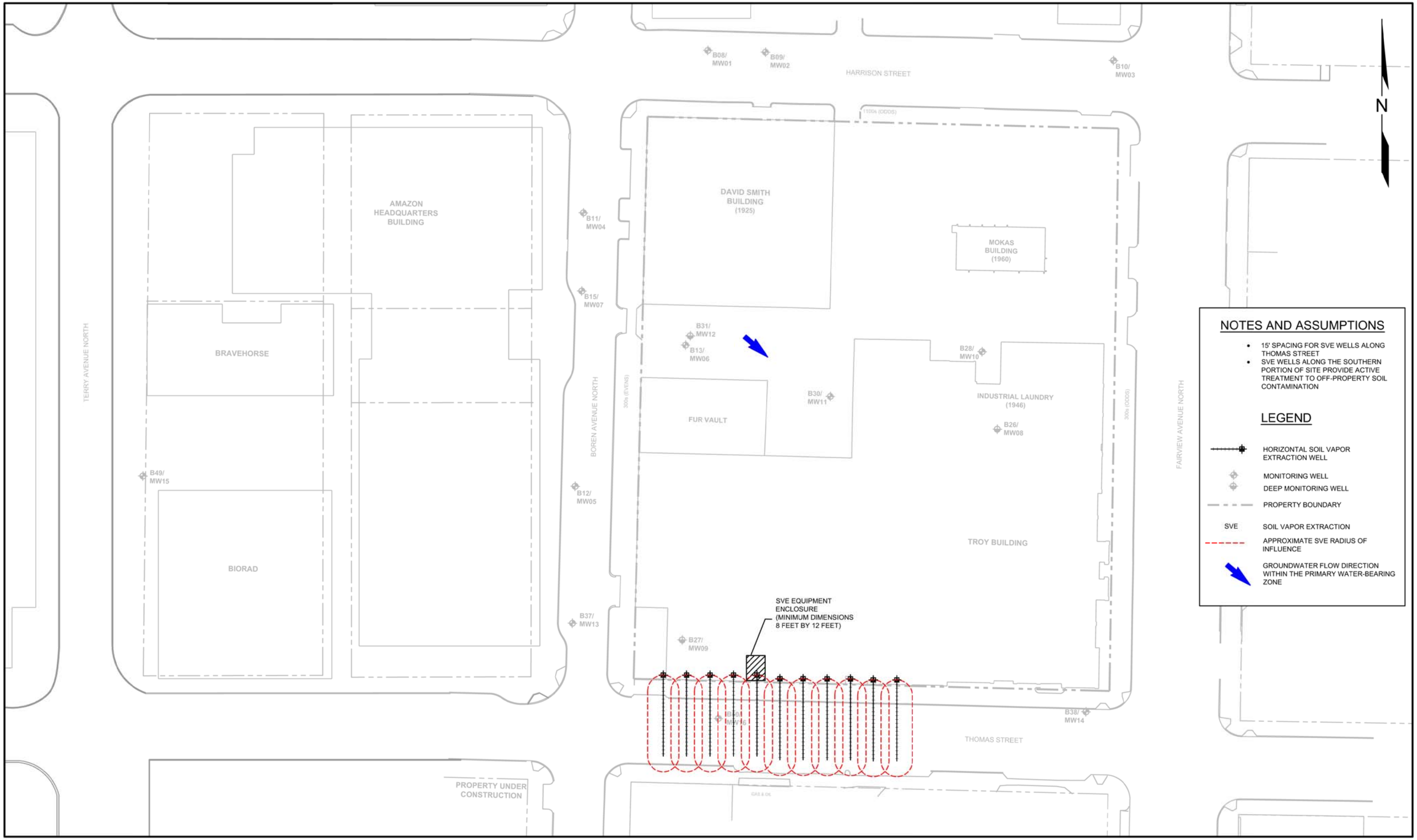

NOTES AND ASSUMPTIONS

- 15' SPACING FOR SVE WELLS ALONG THOMAS STREET
- SVE WELLS ALONG THE SOUTHERN PORTION OF SITE PROVIDE ACTIVE TREATMENT TO OFF-PROPERTY SOIL CONTAMINATION

LEGEND

─┼┼┼┼─⊕	HORIZONTAL SOIL VAPOR EXTRACTION WELL
⊕	MONITORING WELL
⊕	DEEP MONITORING WELL
— - - —	PROPERTY BOUNDARY
SVE	SOIL VAPOR EXTRACTION
- - - - -	APPROXIMATE SVE RADIUS OF INFLUENCE
↘	GROUNDWATER FLOW DIRECTION WITHIN THE PRIMARY WATER-BEARING ZONE

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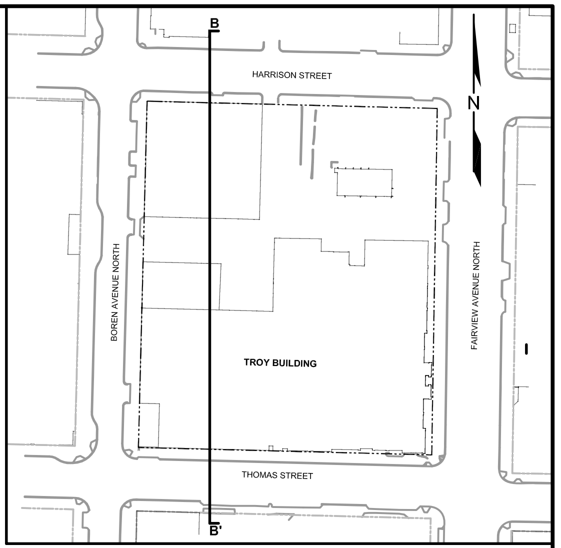
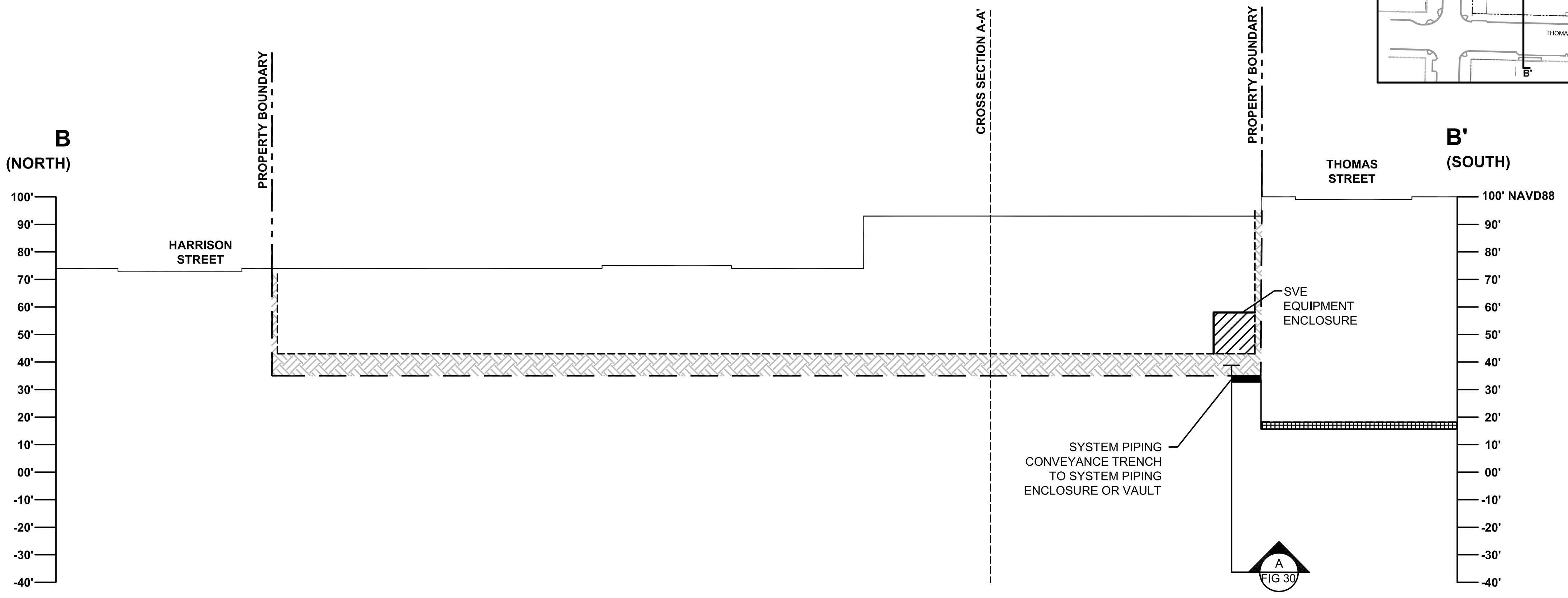
0 30 60 120
APPROXIMATE SCALE IN FEET

FIGURE 28
SOIL VAPOR EXTRACTION SYSTEM CONCEPTUAL LAYOUT





LEGEND

— — —	APPROXIMATE LIMITS OF CONSTRUCTION EXCAVATION (ELEVATION TO BE DETERMINED) AND LIMITS OF REMEDIAL EXCAVATION (ELEVATION 19')
▨	CONCRETE BUILDING FOUNDATION

GENERAL NOTES:

1. THE LOCATION OF THE SVE EQUIPMENT ENCLOSURE MAY VARY BASED ON CONSTRUCTION PLANS THAT ARE NOT AVAILABLE AT THIS TIME.
2. THE SVE EQUIPMENT ENCLOSURE FOOTPRINT SHALL BE 8 FEET BY 12 FEET.

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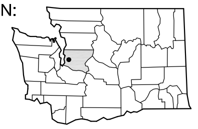
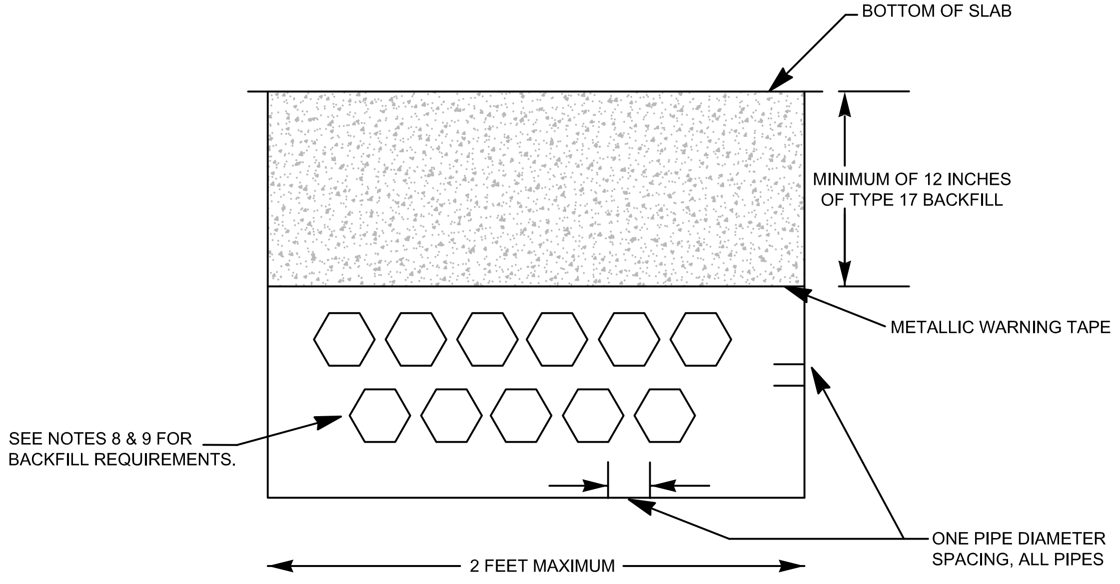


APPROXIMATE SCALE IN FEET

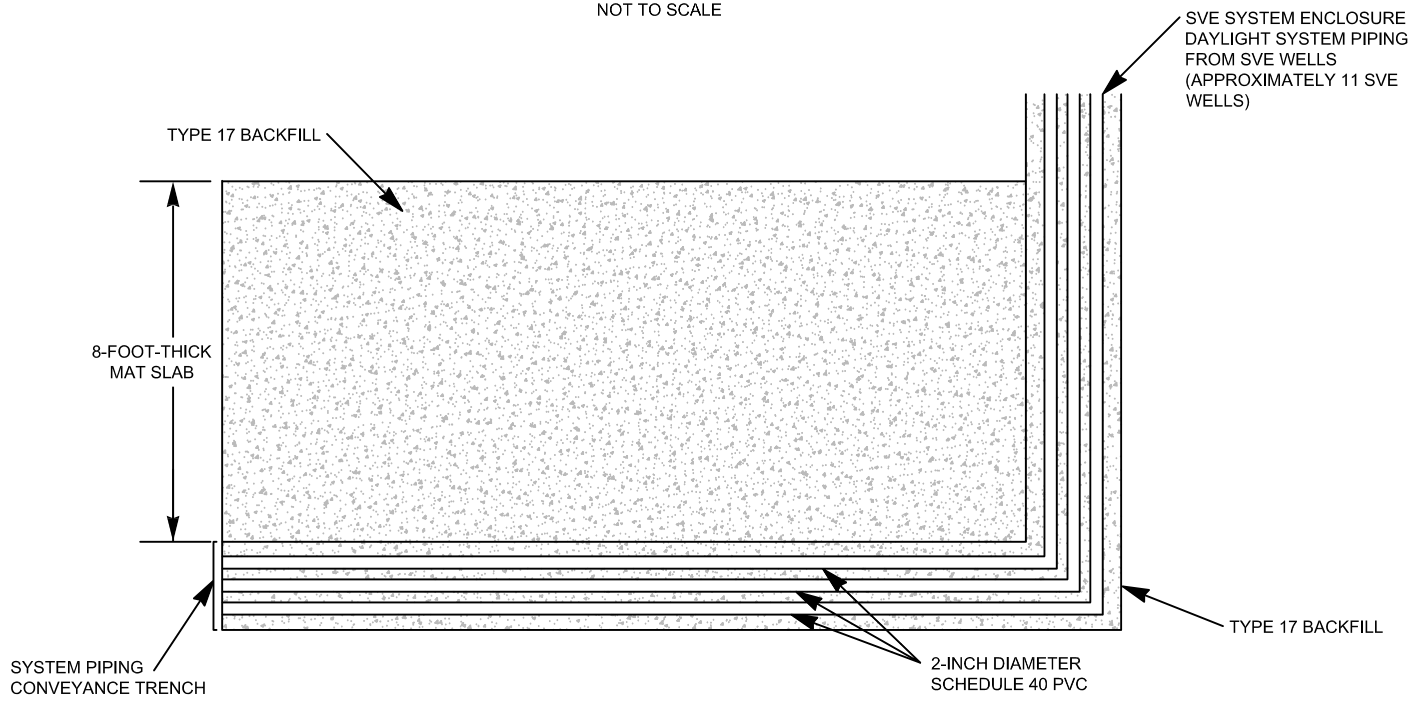
FIGURE 29
SOIL VAPOR EXTRACTION DETAIL
CROSS SECTION B-B'

1/17/2013

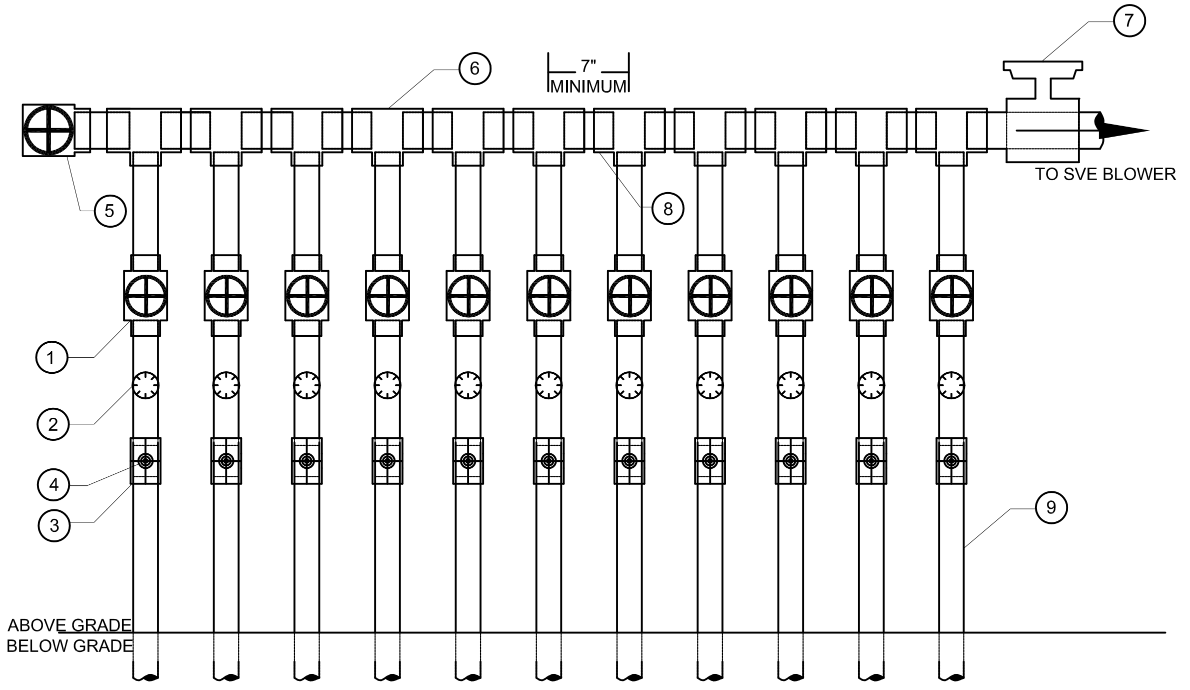
PIPE TRENCH SECTION
NOT TO SCALE



FLOOR SLAB AND CONVEYANCE TRENCH SECTION
NOT TO SCALE



SVE MANIFOLD
NOT TO SCALE



SVE MANIFOLD LEGEND

1. 2-INCH-DIAMETER, PVC TRUE UNION 2000 STANDARD GATE VALVE (SPEARS PART NO 2012-020).
2. VACUUM GAUGE, CENTER BACK MOUNT.
3. SCHEDULE 80 PVC REDUCING TEE 2"x2"x$\frac{1}{2}$" (SPEARS PART NO. 801-247C).
4. SCHEDULE 80 PVC $\frac{1}{2}$" PLUG.
5. 3-INCH-DIAMETER BRASS GATE VALVE EQUIPPED WITH SILENCER.
6. SCHEDULE 80 PVC REDUCING TEE 3"x3"x2" (SPEARS PART NO. 801-338).
7. 3-INCH-DIAMETER, PVC TRUE UNION 2000 STANDARD BALL VALVE (SPEARS PART NO. 3639-030).
8. 3-INCH-DIAMETER, SCHEDULE 80 PVC MAIN SUCTION HEADER.
9. 2-INCH-DIAMETER, SCHEDULE 40 PVC.

GENERAL NOTES:

1. INSPECT ALL PIPE FOR CUTS, SCRATCHES, GOUGES, OR SPLIT ENDS UPON DELIVERY TO SITE AND PRIOR TO INSTALLATION. DO NOT USE DAMAGED SECTIONS OF PIPE.
2. STORE AND HANDLE PIPING IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. THE ENDS OF ALL PIPE SHALL BE CAPPED OR SEALED AT ALL TIMES TO PREVENT FOREIGN MATERIALS (e.g. RATS) FROM ENTERING PIPES.
3. TRENCH BOTTOM SHALL BE CONTINUOUS, FREE OF ROCKS, AND RELATIVELY SMOOTH. IF NECESSARY, PAD TRENCH BOTTOM WITH MIN. 4" TAMPED EARTH OR SAND BELOW PIPE TO CUSHION PIPE AND PROTECT PIPE FROM DAMAGE.
4. FOLLOW MANUFACTURER RECOMMENDATIONS FOR PIPE SOLVENT CONNECTIONS AND CURE TIMES.
5. PIPES SHALL BE TESTED FOR LEAKS PRIOR TO BACKFILLING.
6. FOLLOW PVC PIPING MANUFACTURER RECOMMENDATIONS FOR SNAKING OF BURIED PIPE TO COMPENSATE FOR THERMAL EXPANSION/CONTRACTION. (e.g. 3" OFFSET FOR 20' OF PIPE WITH TEMP. VARIATION OF 10 DEGREES F, 5" OFFSET FOR 20' OF PIPE WITH TEMP. VARIATION OF 30 DEGREES F).
7. SURROUND THE PIPE(S) WITH 6 TO 8 INCHES OF BACKFILL. BACKFILL SHALL BE FREE OF ROCKS WITH A PARTICLE SIZE OF 0.5 INCHES OR LESS.
8. BACKFILL SHALL BE PLACED IN 6- TO 8-INCH LOOSE LIFTS AND COMPACTED BY HAND OR WITH A MECHANICAL TAMPER. A 12-INCH LOOSE LIFT SHALL BE PLACED ABOVE PIPE PRIOR TO BEGINNING COMPACTION. LARGE OR SHARP ROCKS, FROZEN CLODS, AND OTHER DEBRIS GREATER THAN 3" IN DIAMETER SHALL BE REMOVED. ROLLING EQUIPMENT OR HEAVY TAMPER SHALL ONLY BE USED TO CONSOLIDATE THE FINAL BACKFILL.
9. BACKFILL COMPACTION SHALL BE 95% STANDARD PROCTOR. AN UNYIELDING SURFACE ON THE FINAL LIFT OF THE BACKFILL SHALL BE PROVIDED PRIOR TO SEALING THE TRENCH.

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PROJECT NUMBER: 0731-004
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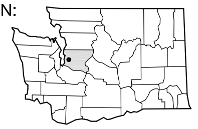
CITY,STATE: SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

FIGURE 30
SVE SYSTEM PIPING MANIFOLD AND CONVEYANCE TRENCH DETAILS

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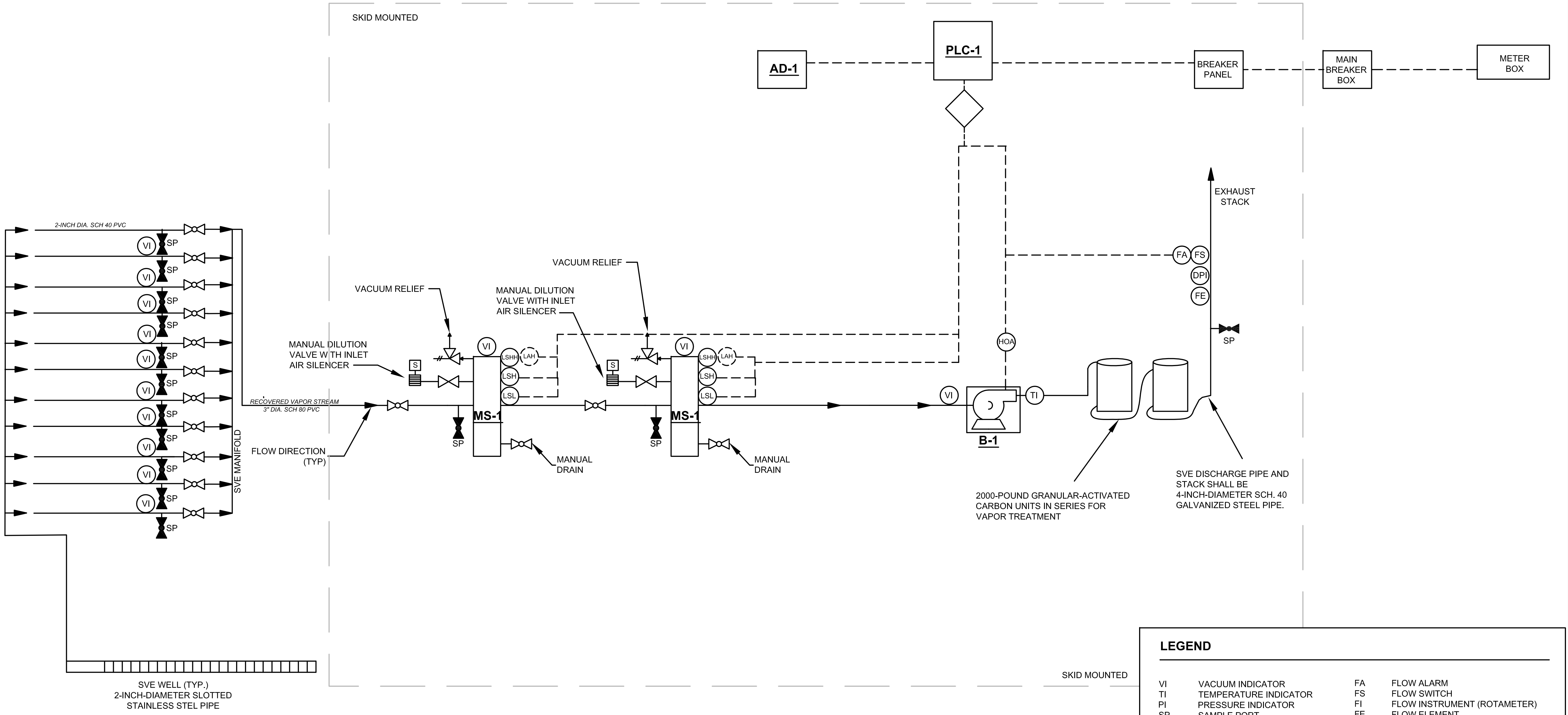
P:\0731 Touchstone\0731-004 Troy Laundry\Technical\CAD\2013 ICAP\0731-004_2013ICAP_SVE_PFD_F.dwg 1/17/2013



AD-1	AUTODIALER (TELEMETRY)
B-1	SOIL VAPOR EXTRACTION BLOWER
MS-1	MOISTURE SEPARATOR WITH INTERNAL 100 MICRON FILTER
PLC-1	CONTROL PANEL WITH PROCESS LOGIC CONTROLLER
SVE	SOIL VAPOR EXTRACTION

LEGEND

VI	VACUUM INDICATOR
TI	TEMPERATURE INDICATOR
PI	PRESSURE INDICATOR
SP	SAMPLE PORT
TP	TRANSFER PUMP
	VACUUM RELIEF VALVE
⧓	SAMPLE PORT

FA	FLOW ALARM
FS	FLOW SWITCH
FI	FLOW INSTRUMENT (ROTAMETER)
FE	FLOW ELEMENT
DPI	DIFFERENTIAL PRESSURE INDICATOR
LAH	LEVEL ALARM HIGH
LSL	LEVEL SWITCH LOW
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
HOA	HAND OFF AUTO SWITCH
⋈	GATE VALVE
⋈	BALL VALVE

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CHECKED BY: SES
CAD FILE: 0731-004_2013ICAP_SVE_PFD

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

#	DATE	REVISION
		SHEET NO.

NOT TO SCALE

FIGURE 31

SVE SYSTEM
PROCESS FLOW DIAGRAM

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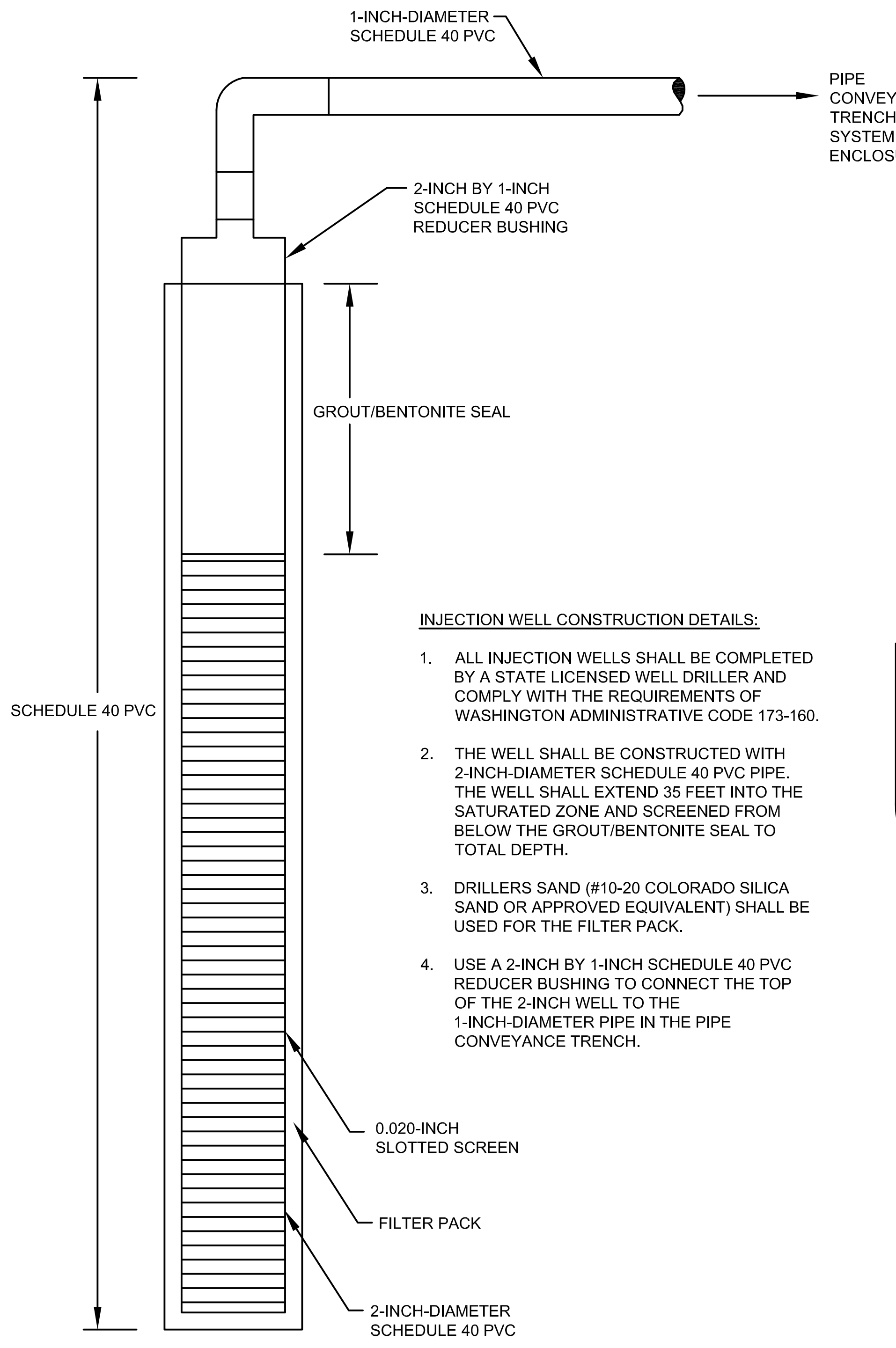
1/17/2013

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_WELL.DWG

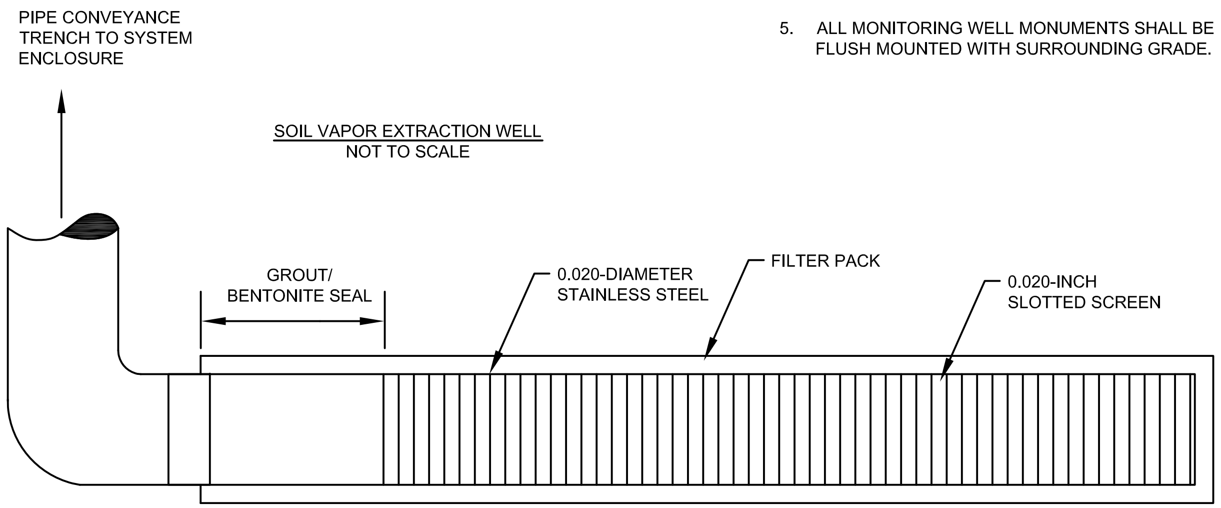
INJECTION WELL
NOT TO SCALE



INJECTION WELL CONSTRUCTION DETAILS:

1. ALL INJECTION WELLS SHALL BE COMPLETED BY A STATE LICENSED WELL DRILLER AND COMPLY WITH THE REQUIREMENTS OF WASHINGTON ADMINISTRATIVE CODE 173-160.
2. THE WELL SHALL BE CONSTRUCTED WITH 2-INCH-DIAMETER SCHEDULE 40 PVC PIPE. THE WELL SHALL EXTEND 35 FEET INTO THE SATURATED ZONE AND SCREENED FROM BELOW THE GROUT/BENTONITE SEAL TO TOTAL DEPTH.
3. DRILLERS SAND (#10-20 COLORADO SILICA SAND OR APPROVED EQUIVALENT) SHALL BE USED FOR THE FILTER PACK.
4. USE A 2-INCH BY 1-INCH SCHEDULE 40 PVC REDUCER BUSHING TO CONNECT THE TOP OF THE 2-INCH WELL TO THE 1-INCH-DIAMETER PIPE IN THE PIPE CONVEYANCE TRENCH.

SOIL VAPOR EXTRACTION WELL
NOT TO SCALE



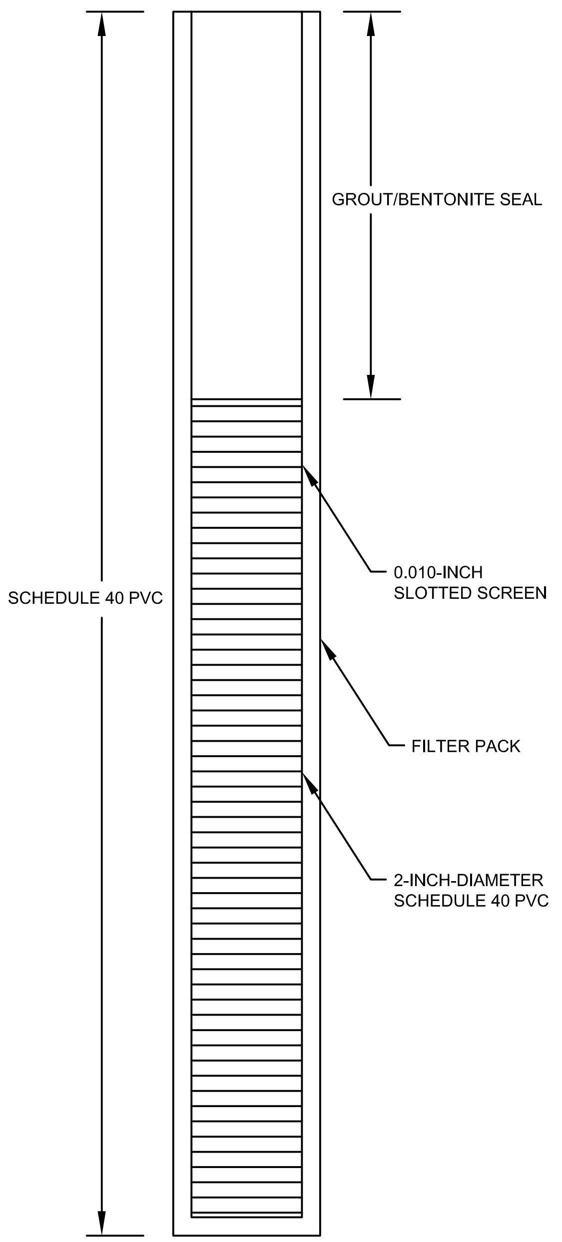
SOIL VAPOR EXTRACTION CONSTRUCTION DETAILS:

1. ALL EXTRACTION WELLS SHALL BE COMPLETED BY A STATE LICENSED WELL DRILLER AND COMPLY WITH THE REQUIREMENTS OF WASHINGTON ADMINISTRATIVE CODE 173-160.
2. THE WELL SHALL BE CONSTRUCTED WITH 2-INCH-DIAMETER STAINLESS STEEL PIPE. THE WELL SHALL EXTEND 45-50 FEET HORIZONTALLY BENEATH THOMAS STREET RIGHT OF WAY. THE SCREEN SHALL EXTEND FROM BELOW THE GROUT/BENTONITE SEAL TO TOTAL LENGTH OF 50 FEET.
3. DRILLERS SAND (#10-20 COLORADO SILICA SAND) OR APPROVED EQUIVALENT) SHALL BE USED FOR THE FILTER PACK.
4. USE A THREADED PVC COUPLED TO TRANSITION FROM STEEL TO 2-INCH-DIAMETER SCHEDULE 40 PVC TO CONNECT TOP OF SOIL VAPOR EXTRACTION WELL TO PIPING IN CONVEYANCE TRENCH.

MONITORING WELL CONSTRUCTION DETAILS:

1. ALL MONITORING WELLS SHALL BE COMPLETED BY A STATE LICENSED WELL DRILLER AND COMPLY WITH THE REQUIREMENTS OF WASHINGTON ADMINISTRATIVE CODE 173-160.
2. THE WELL SHALL BE CONSTRUCTED WITH 2-INCH-DIAMETER SCHEDULE 40 PVC PIPE. THE WELL SHALL EXTEND 30 FEET BELOW THE TOP OF THE GROUNDWATER TABLE.
3. THE MONITORING WELL SHALL HAVE A 20-FOOT SCREENED SECTION.
4. DRILLERS SAND (#10-20 COLORADO SILICA SAND) OR APPROVED EQUIVALENT) SHALL BE USED FOR THE FILTER PACK.
5. ALL MONITORING WELL MONUMENTS SHALL BE FLUSH MOUNTED WITH SURROUNDING GRADE.

MONITORING WELL
NOT TO SCALE



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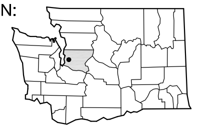
CAD FILE: 0731-004_2013CAP_WELL

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

FIGURE 32

INJECTION, SOIL VAPOR EXTRACTION, AND MONITORING WELL CONSTRUCTION DETAILS

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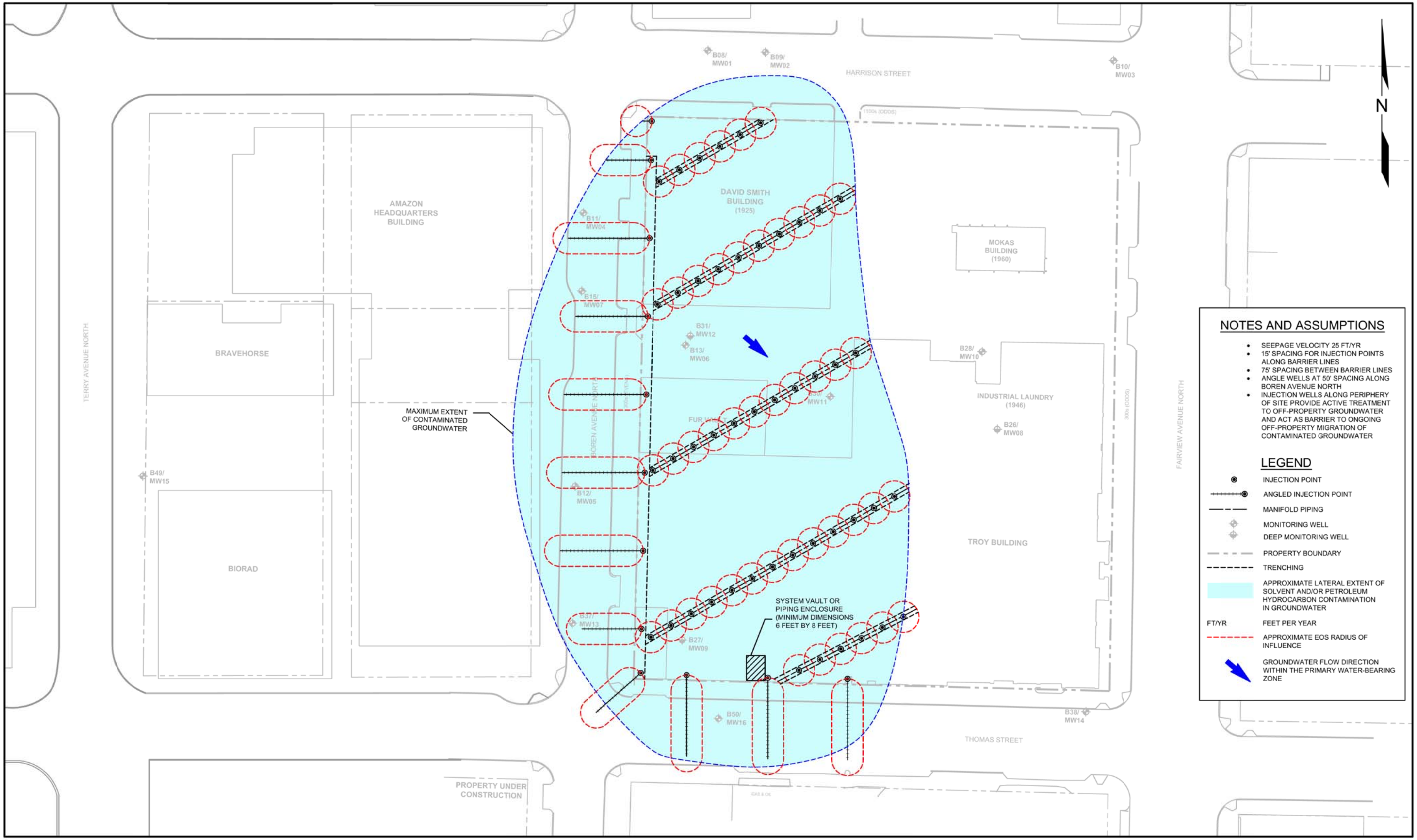

NOTES AND ASSUMPTIONS

- SEEPAGE VELOCITY 25 FT/YR
- 15' SPACING FOR INJECTION POINTS ALONG BARRIER LINES
- 75' SPACING BETWEEN BARRIER LINES
- ANGLE WELLS AT 50' SPACING ALONG BOREN AVENUE NORTH
- INJECTION WELLS ALONG PERIPHERY OF SITE PROVIDE ACTIVE TREATMENT TO OFF-PROPERTY GROUNDWATER AND ACT AS BARRIER TO ONGOING OFF-PROPERTY MIGRATION OF CONTAMINATED GROUNDWATER

LEGEND

◉	INJECTION POINT
─┼┼┼─◉	ANGLED INJECTION POINT
— — —	MANIFOLD PIPING
⌖	MONITORING WELL
⌖	DEEP MONITORING WELL
— - - —	PROPERTY BOUNDARY
- - - -	TRENCHING
🟦	APPROXIMATE LATERAL EXTENT OF SOLVENT AND/OR PETROLEUM HYDROCARBON CONTAMINATION IN GROUNDWATER
FT/YR	FEET PER YEAR
- - - -	APPROXIMATE EOS RADIUS OF INFLUENCE
➘	GROUNDWATER FLOW DIRECTION WITHIN THE PRIMARY WATER-BEARING ZONE

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PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:

0 30 60 120
APPROXIMATE SCALE IN FEET

FIGURE 33

GROUNDWATER TREATMENT
CONCEPTUAL LAYOUT
IN SITU REDUCTIVE DECHLORINATION

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_CL_F.DWG
1/17/2013

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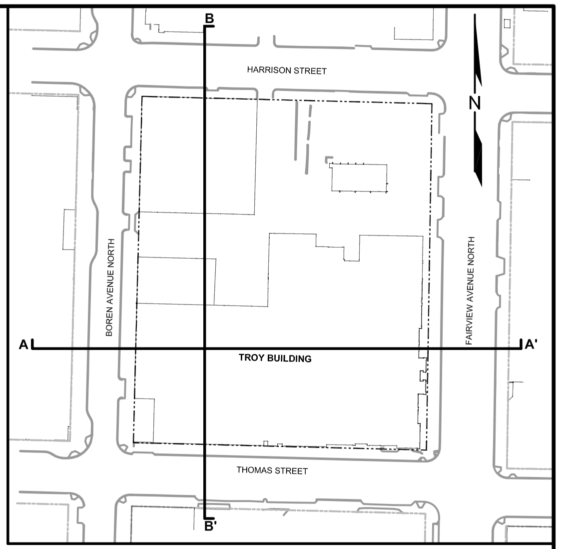

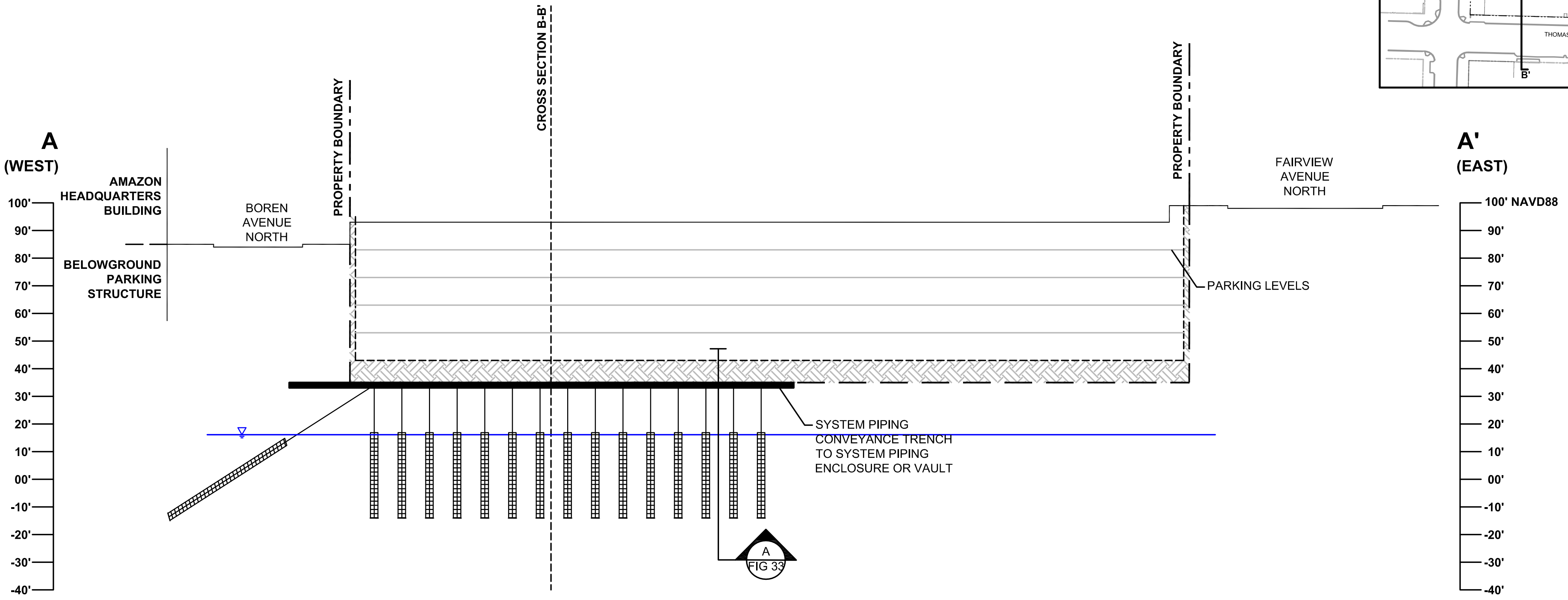

LEGEND

INJECTION WELL

SCREEN INTERVAL

GROUNDWATER LEVEL (OCTOBER 20, 2011)

— — — APPROXIMATE LIMITS OF CONSTRUCTION EXCAVATION (ELEVATION TO BE DETERMINED) AND LIMITS OF REMEDIAL EXCAVATION (ELEVATION 19')

▨ CONCRETE BUILDING FOUNDATION

GENERAL NOTES:

1. THE LOCATION OF THE SYSTEM PIPING ENCLOSURE OR VAULT MAY VARY BASED ON CONSTRUCTION PLANS THAT ARE NOT AVAILABLE AT THIS TIME.
2. THE SYSTEM PIPING ENCLOSURE OR VAULT SHALL BE ACCESSIBLE BY A TEMPORARY INJECTION SYSTEM. A MINIMUM HEIGHT CLEARANCE OF 6.8 FEET IS REQUIRED.
3. A WATER SUPPLY (HOSE SPIGOT) SHALL BE ACCESSIBLE IN CLOSE PROXIMITY TO THE SYSTEM ENCLOSURE FOR INJECTIONS.

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CHECKED BY: EKR
CAD FILE: 0731-004_2013CAP_XAA

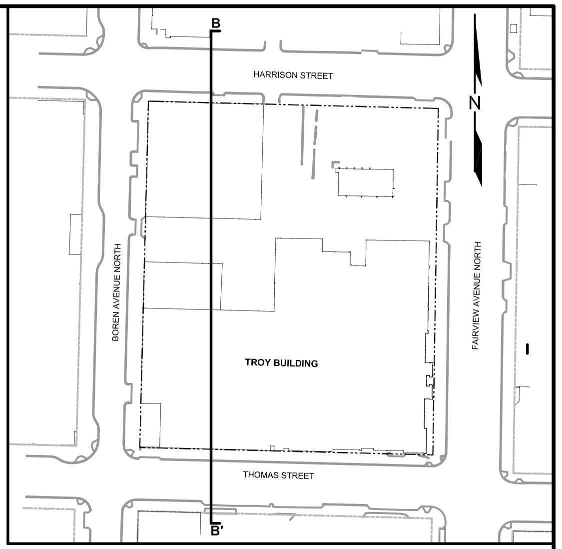
PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

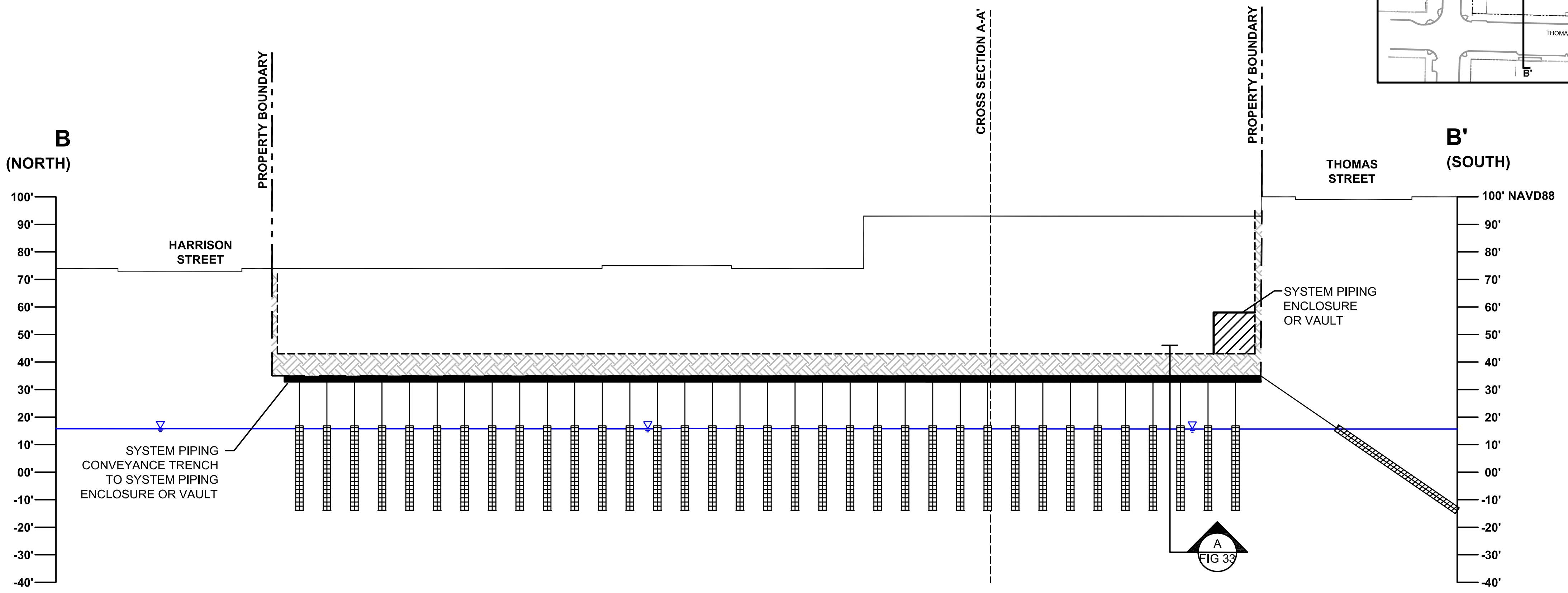
REGION:

0 25 50 100
APPROXIMATE SCALE IN FEET

FIGURE 34
GROUNDWATER TREATMENT DETAIL
CROSS SECTION A-A'
IN SITU REDUCTIVE DECHLORINATION

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_XAA_REM_F.DWG





LEGEND

INJECTION WELL

SCREEN INTERVAL

GROUNDWATER LEVEL (OCTOBER 20, 2011)

APPROXIMATE LIMITS OF CONSTRUCTION EXCAVATION (ELEVATION TO BE DETERMINED) AND LIMITS OF REMEDIAL EXCAVATION (ELEVATION 19')

CONCRETE BUILDING FOUNDATION

GENERAL NOTES:

1. THE LOCATION OF THE SYSTEM PIPING ENCLOSURE OR VAULT MAY VARY BASED ON CONSTRUCTION PLANS THAT ARE NOT AVAILABLE AT THIS TIME.
2. THE SYSTEM PIPING ENCLOSURE OR VAULT SHALL BE ACCESSIBLE BY A TEMPORARY INJECTION SYSTEM. A MINIMUM HEIGHT CLEARANCE OF 7.5 FEET IS REQUIRED.
3. A WATER SUPPLY (HOSE SPIGOT) SHALL BE ACCESSIBLE IN CLOSE PROXIMITY TO THE SYSTEM ENCLOSURE FOR INJECTIONS.

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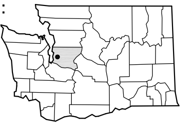
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 25 50 100
APPROXIMATE SCALE IN FEET

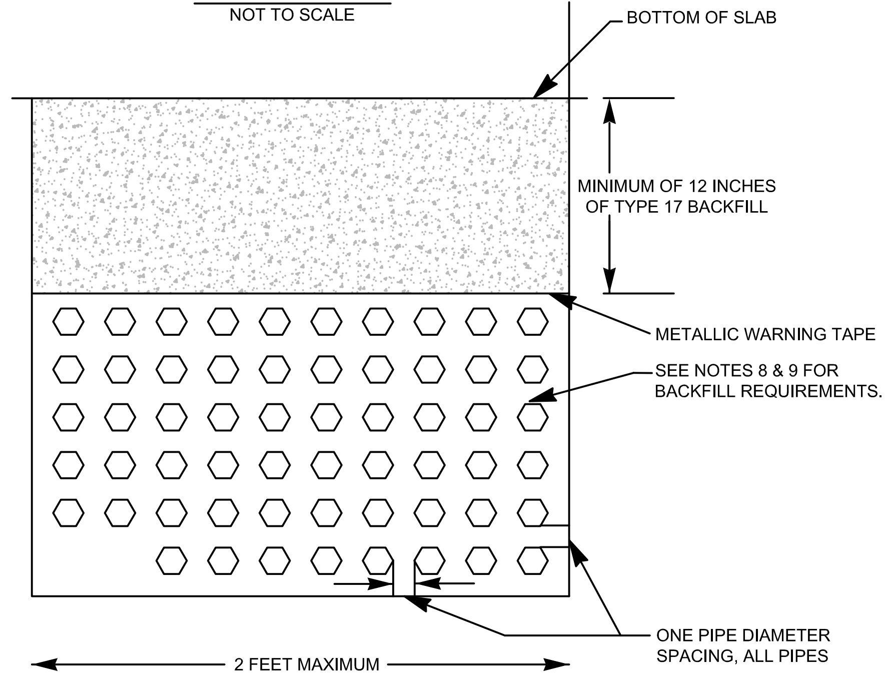
FIGURE 35

GROUNDWATER TREATMENT DETAIL
CROSS SECTION B-B'
IN SITU REDUCTIVE DECHLORINATION

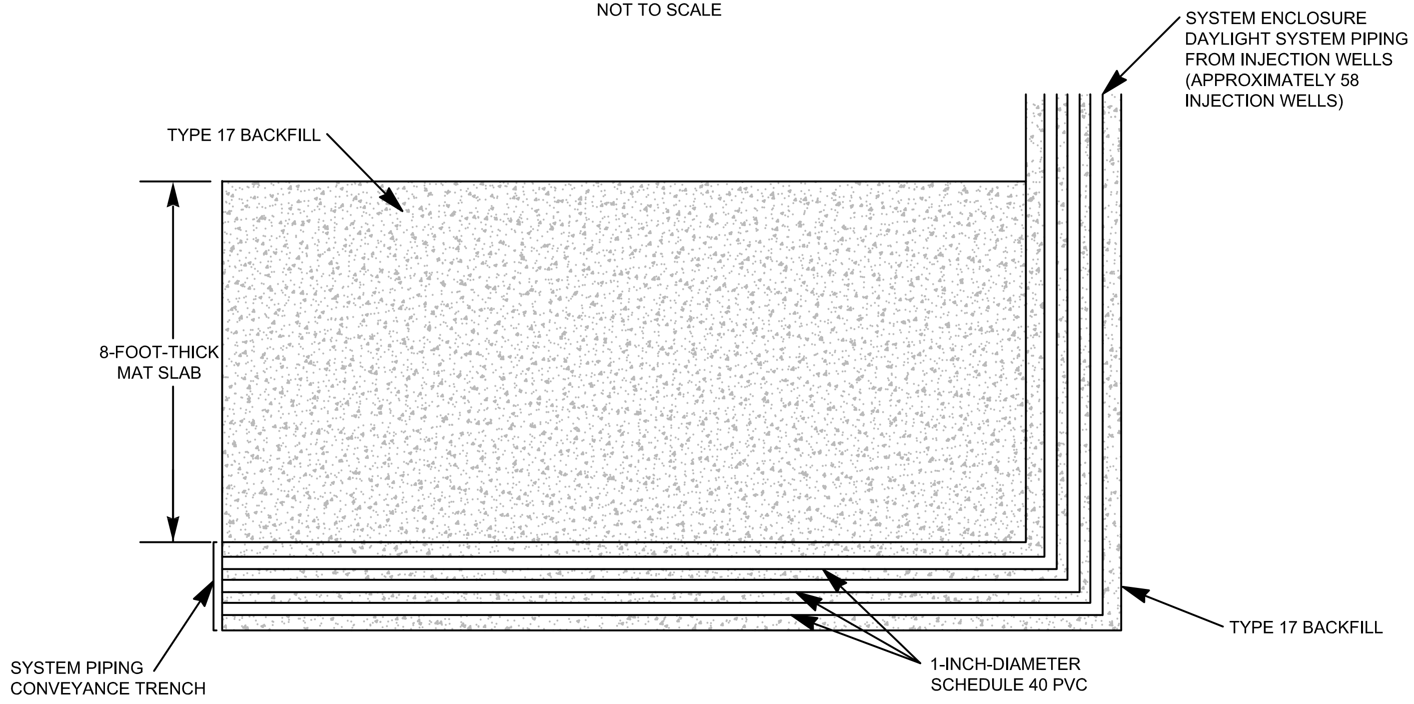
1/17/2013

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\2013 ICAP\0731-004_2013ICAP_PIP_F.DWG

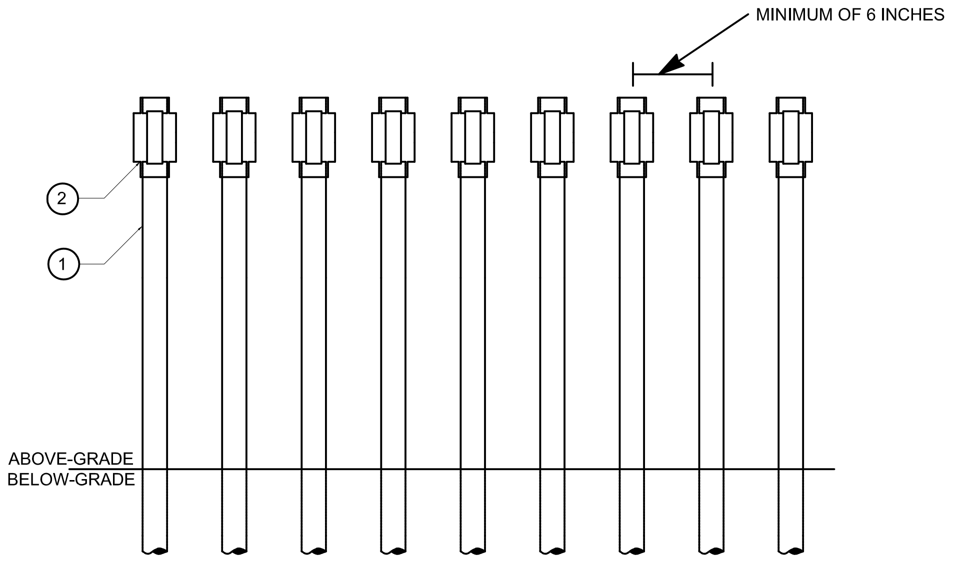
PIPE TRENCH SECTION
NOT TO SCALE



FLOOR SLAB AND CONVEYANCE TRENCH SECTION
NOT TO SCALE



INJECTION MANIFOLD
NOT TO SCALE



LEGEND
1. 1-INCH-DIAMETER, SCHEDULE 40 PVC.
2. 1-INCH-DIAMETER, PVC TRUE UNION STANDARD BALL VALVE (SPEARS PART NO. 3639-010).

GENERAL NOTES:

1. INSPECT ALL PIPE FOR CUTS, SCRATCHES, GOUGES, OR SPLIT ENDS UPON DELIVERY TO SITE AND PRIOR TO INSTALLATION. DO NOT USE DAMAGED SECTIONS OF PIPE.
2. STORE AND HANDLE PIPING IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. THE ENDS OF ALL PIPE SHALL BE CAPPED OR SEALED AT ALL TIMES TO PREVENT FOREIGN MATERIALS (e.g., RATS) FROM ENTERING PIPES.
3. TRENCH BOTTOM SHALL BE CONTINUOUS, FREE OF ROCKS, AND RELATIVELY SMOOTH. IF NECESSARY, PAD TRENCH BOTTOM WITH MIN. 4" TAMPED EARTH OR SAND BELOW PIPE TO CUSHION PIPE AND PROTECT PIPE FROM DAMAGE.
4. FOLLOW MANUFACTURER RECOMMENDATIONS FOR PIPE SOLVENT CONNECTIONS AND CURE TIMES.
5. PIPES SHALL BE TESTED FOR LEAKS PRIOR TO BACKFILLING.
6. FOLLOW PVC PIPING MANUFACTURER RECOMMENDATIONS FOR SNAKING OF BURIED PIPE TO COMPENSATE FOR THERMAL EXPANSION/CONTRACTION. (e.g., 3" OFFSET FOR 20' OF PIPE WITH TEMP. VARIATION OF 10 DEGREES F, 5" OFFSET FOR 20' OF PIPE WITH TEMP. VARIATION OF 30 DEGREES F).
7. SURROUND THE PIPE(S) WITH 6 TO 8 INCHES OF BACKFILL. BACKFILL SHALL BE FREE OF ROCKS WITH A PARTICLE SIZE OF 0.5 INCHES OR LESS.
8. BACKFILL SHALL BE PLACED IN 6- TO 8-INCH LOOSE LIFTS AND COMPACTED BY HAND OR WITH A MECHANICAL TAMPER. A 12-INCH LOOSE LIFT SHALL BE PLACED ABOVE PIPE PRIOR TO BEGINNING COMPACTION. LARGE OR SHARP ROCKS, FROZEN CLODS, AND OTHER DEBRIS GREATER THAN 3" IN DIAMETER SHALL BE REMOVED. ROLLING EQUIPMENT OR HEAVY TAMPER SHALL ONLY BE USED TO CONSOLIDATE THE FINAL BACKFILL.
9. BACKFILL COMPACTION SHALL BE 95% STANDARD PROCTOR. AN UNYIELDING SURFACE ON THE FINAL LIFT OF THE BACKFILL SHALL BE PROVIDED PRIOR TO SEALING THE TRENCH.

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DATE: 01/11/13
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CAD FILE: 0731-004_2013ICAP_PIP

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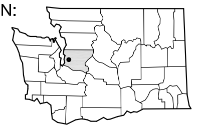
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

FIGURE 36
INJECTION SYSTEM PIPING MANIFOLD
CONVEYANCE TRENCH DETAILS

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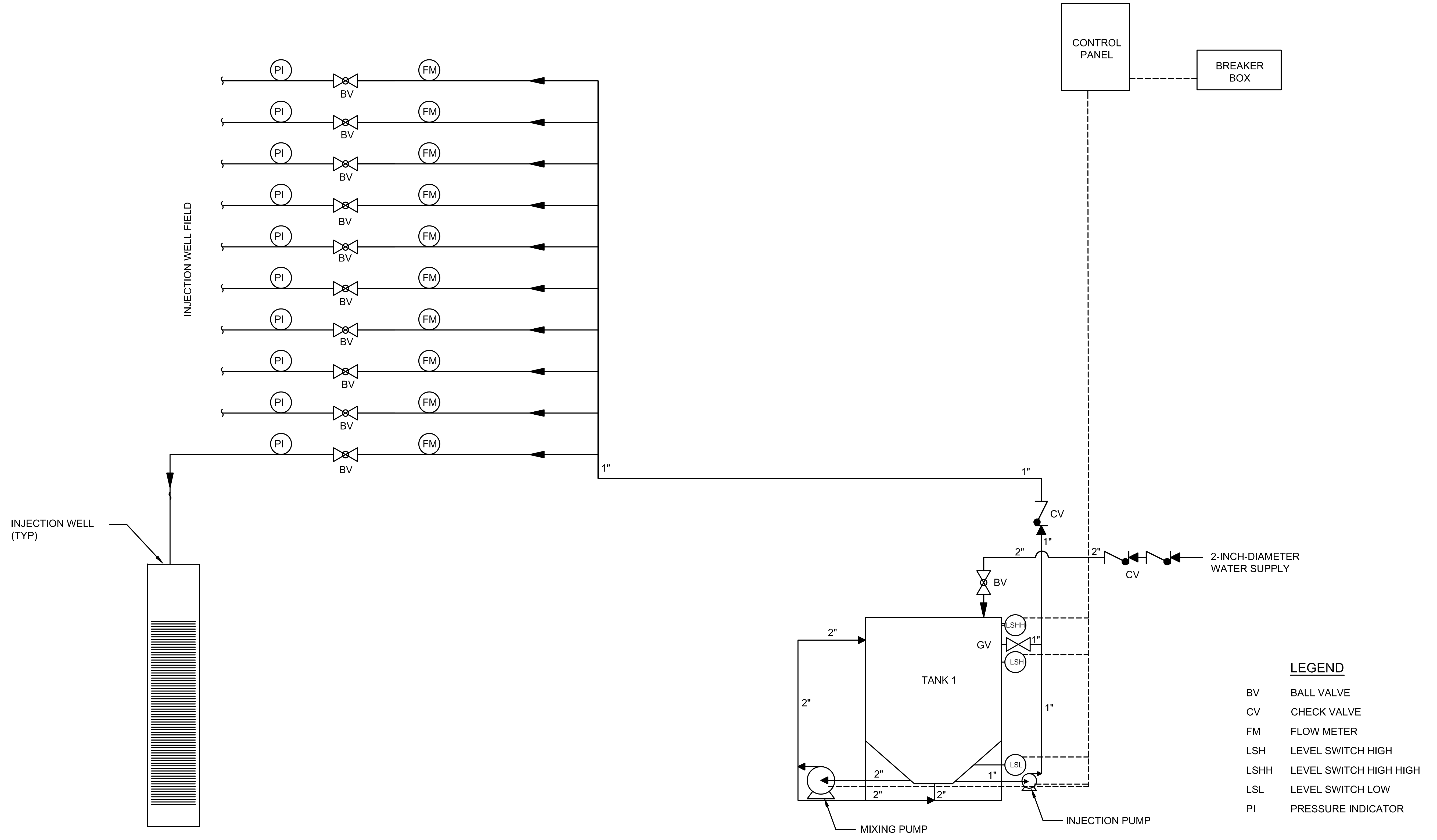

LEGEND

BV	BALL VALVE
CV	CHECK VALVE
FM	FLOW METER
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
PI	PRESSURE INDICATOR

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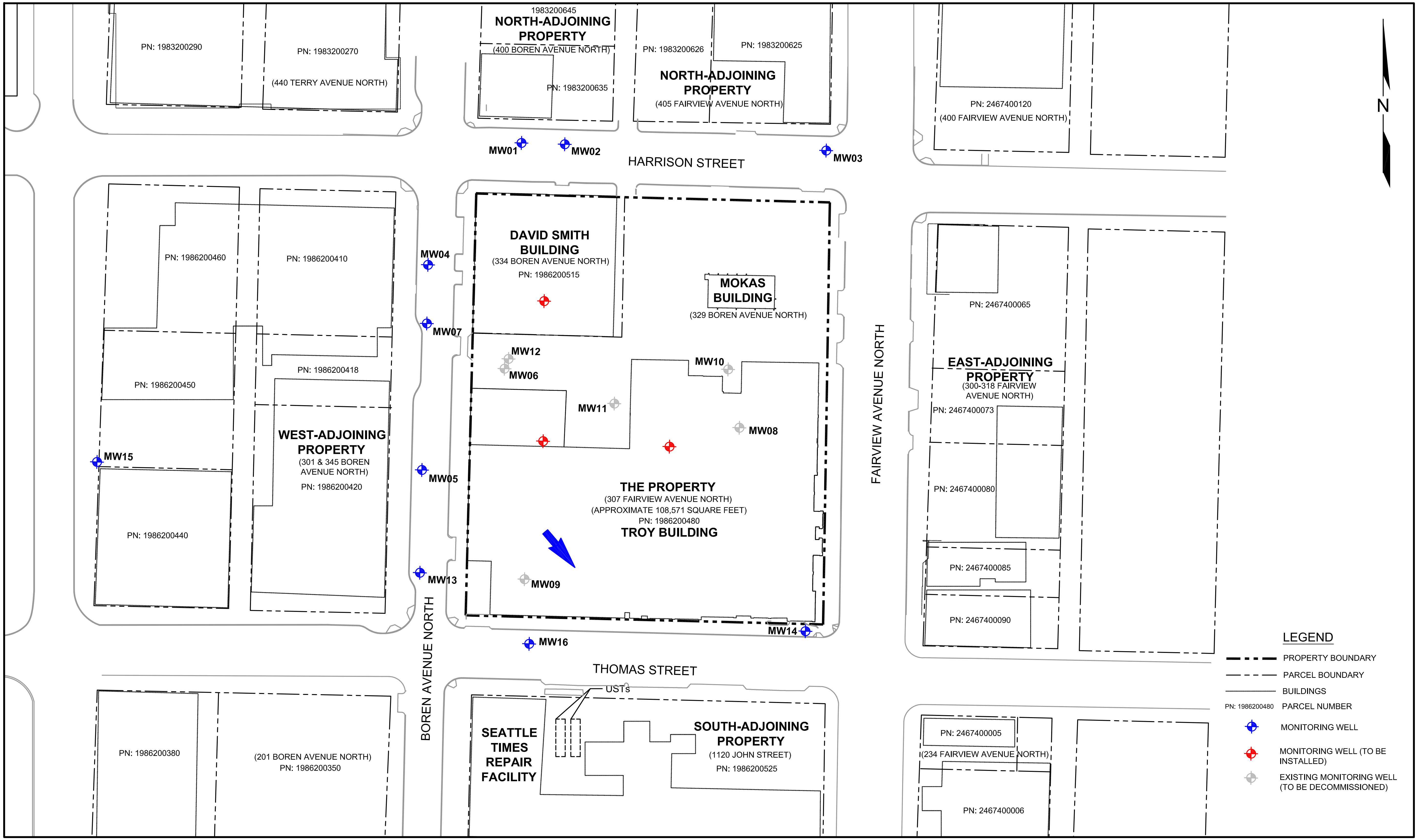
DATE: 10/12/12
DRAWN BY: NAC
CHECKED BY: SES/TWM
CAD FILE: 0731-004_2013ICAP_PFD

PROJECT NAME: TROY LAUNDRY PROPERTY
SES PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

NOT TO SCALE

FIGURE 37
INJECTION SYSTEM PROCESS FLOW DIAGRAM



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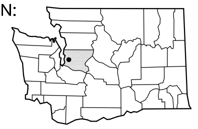
CAD FILE: 0731-004_2013ICAP_COMP_MW

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 40 80 160
APPROXIMATE SCALE IN FEET

FIGURE 38
GROUNDWATER COMPLIANCE MONITORING WELLS

TABLES

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)														
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
On Property																			
P01	P01-05	5	10/06/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P01-07.5	7.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P01-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P01-14	14			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P01-18.5	18.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.026	--
	P01-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.028	--
P02	P02-02	2	10/06/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.039	--
	P02-05	5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.042	--
	P02-07.5	7.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.025	--
	P02-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.035	--
P03	P03-05	5	10/06/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.13**	--
	P03-09	9			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.099**	--
	P03-12.5	12.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.076**	--
	P03-16	16			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.057**	--
	P03-19	19			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.080**	--
P04	P04-02.5	2.5	10/06/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P04-05	5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P04-07.5	7.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P04-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P04-13	13			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P04-17	17			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.029	--
	P04-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
P05	P05-02.5	2.5	10/06/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**1.4**	--
	P05-05	5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**2.5**	--
	P05-07.5	7.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.073**	--
	P05-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.087**	--
	P05-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.082**	--
	P05-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.14**	--
P06	P06-02.5	2.5	10/06/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.15**	--
	P06-05	5			--	--	--	--		--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.68**	--
	P06-08	8			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.44**	--
	P06-11	11			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.028	--
	P06-14	14			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.063**	--
	P06-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.099**	--
P07	P07-02.5	2.5	10/06/10	SoundEarth	<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	0.047	--
	P07-05	5			<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**0.13**	--
	P07-07.5	7.5			<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**0.055**	--
	P01-11	11			**1,400**[x]	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**0.16**	--
MTCA Cleanup Level					**100/30**[a,b]	**2,000**[b]	**2,000**[b]	**0.03**[b]	**7**[b]	**6**[b]	**9**[b]	**0.67**[c]	**160**[d]	**1,600**[d]	**11**[c]	**0.03**[b]	**0.05**[b]	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
P08	P08-03	3	10/07/10	SoundEarth	**52**[x]	100[x]	<250	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	**0.15**	**63**	--
	P08-05	5			2.6[x]	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**0.46**	--
	P08-07.5	7.5			**580**[x]	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	**0.14**	**450**	--
	P08-10	10			**150**[x]	**4,300**[x]	**3,200**	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	**0.13**	**250**	--
	P08-14	14			<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**1.3**	--
	P08-18	18			<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**1.6**	--
	P08-23	23			<2	<50	<250	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**1.6**	--
P09	P09-05	5	10/07/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.098**	--
	P09-07.5	7.5			<2	<50	<250	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P09-12	12			2.3[x]	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**0.076**	--
	P09-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.089**	--
P10	P10-02.5	2.5	10/07/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.13**	--
	P10-07.5	7.5			<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	**0.066**	--
	P10-14	14			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.038	--
	P10-18	18			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.069**	--
	P10-22	22			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.030	--
P11	P11-02.5	2.5	10/07/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P11-07.5	7.5			<2	<50	<250	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	0.039	--
	P11-11	11			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P11-14	14			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P11-18	18			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.10**	--
P12	P12-05	5	10/07/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P12-10	10			<2	--	--	<0.03	<0.05	<0.05	<0.15	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P12-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
P13	P13-02.5	2.5	10/07/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P13-07.5	7.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P13-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P13-18	18			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
P14	P14-02.5	2.5	10/07/10	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P14-07.5	7.6			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P14-14	14			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	P14-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B01	--	6-8	12/08/10	AECOM	<5.7	<5.1	<10	<0.001	NR	NR	NR	NR	<0.001	NR	NR	0.003	**0.22**	--
	--	8-10			--	--	--	<0.0012	NR	NR	NR	NR	<0.0012	NR	NR	0.0028	**0.2**	--
	--	18-20			--	--	--	<0.0009	NR	NR	NR	NR	0.0039	NR	NR	0.0058	**0.86**	--
B02	--	7-9	12/08/10	AECOM	--	--	--	0.0062	NR	NR	NR	NR	0.0013	NR	NR	**0.031**	**2.3**	--
	--	9-11			<6	<5.2	<10	0.001	NR	NR	NR	NR	0.0015	NR	NR	0.02	**2.3**	--
	--	16-18			--	--	--	<0.0011	NR	NR	NR	NR	0.0013	NR	NR	0.0046	**0.5**	--
MTCA Cleanup Level					**100/30**[a,b]	**2,000**[b]	**2,000**[b]	**0.03**[b]	**7**[b]	**6**[b]	**9**[b]	**0.67**[c]	**160**[d]	**1,600**[d]	**11**[c]	**0.03**[b]	**0.05**[b]	**NE**

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Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B03	--	--	--	AECOM	No Samples Collected													
B04	--	8-10	12/08/10	AECOM	--	--	--	0.003	NR	NR	NR	NR	<0.0009	NR	NR	0.0098	**2**	--
	--	14-16			<5.2	<5	<10	<0.001	NR	NR	NR	NR	<0.001	NR	NR	0.0069	**0.69**	--
	--	18-20			--	--	--	<0.001	NR	NR	NR	NR	<0.001	NR	NR	0.003	**0.47**	--
B05	--	10-12	12/08/10	AECOM	--	--	--	<0.0009	NR	NR	NR	NR	<0.0009	NR	NR	<0.0009	**0.057**	--
	--	13-15			<5	<5.2	<10	<0.0009	NR	NR	NR	NR	<0.0009	NR	NR	0.0012	**0.34**	--
	--	18-20			--	--	--	<0.0009	NR	NR	NR	NR	<0.0009	NR	NR	0.0012	**0.42**	--
B06	--	5-7	12/08/10	AECOM	--	--	--	<0.051	NR	NR	NR	NR	<0.051	NR	NR	<0.051	**0.87**	--
	--	8-10			--	--	--	<0.047	NR	NR	NR	NR	<0.047	NR	NR	<0.047	**0.53**	--
	--	10-11.5			<4.9	<5.7	<1	<0.052	NR	NR	NR	NR	<0.052	NR	NR	<0.052	**0.43**	--
B07	--	23-26	12/08/10	AECOM	<6.2	<5.9	<12	<0.06	NR	NR	NR	NR	0.064	NR	NR	<0.06	**0.58**	--
	--	35-37			--	--	--	<0.058	NR	NR	NR	NR	<0.058	NR	NR	<0.058	**1.7**	--
	--	37-40			--	--	--	<0.0009	NR	NR	NR	NR	0.017	NR	NR	0.0071	**0.16**	--
B08/MW01	B08-05	5	05/19/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-50	50			<2	<50	<250	<0.2	<0.02	<0.2	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B08-60	60			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
B09/MW02	B09-07	7	05/20/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-45	45			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-60	60			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B09-70	70			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

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Troy Laundry Property
307 Fairview Avenue North
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Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B10/MW03	B10-05	5	05/24/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-10	10			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-75	75			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B10-80	80			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
B11/MW04	B11-05	5	05/25/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-60	60			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B11-65	65			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
B12/MW05	B12-10	10	05/25/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.044	ND
	B12-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.057**	ND
	B12-70	70	05/26/11		--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.035	ND
	B12-75	75			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B12-80	80			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B13/MW06	B13-04.5	4.5	05/25/11	SoundEarth	2.8	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-09	9			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-14	14			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-19	19			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-24	24			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.069**	<0.3
	B13-29	29			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.039	<0.3
	B13-34	34			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-39	39			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-44	44			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.037	<0.3
	B13-49	49			**1,700**	300	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.070**	<0.3
	B13-54	54			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-55	55	05/26/11		<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-58	58			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-64	64			<2	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-69	69			<2	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B13-74	74			<2	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
B14	B14-04	4	05/26/11	SoundEarth	<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-09	9			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-14	14			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-19	19			<2	<50	<250	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-23.5	23.5			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-30	30			**1,100**	350[x]	<250	<0.2	<0.2	2.0	2.7	<0.05	<0.05	<0.05	<0.05	<0.03	**0.23**	<0.3
	B14-33.5	33.5			**930**	120[x]	<250	<0.2	<0.2	2.4	3.1	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-36	36			14	<50	<250	<0.02	<0.02	0.059	0.070	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-41	41			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	0.31
	B14-46	46	05/27/11		<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	1.2
	B14-51	51			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	0.44
	B14-56	56			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-58	58			**2,000**	<50	<250	<0.1	<0.1	2.7	3.9	<0.05	<0.05	<0.05	<0.05	<0.03	**0.13**	<0.3
	B14-61	61			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	1.1
	B14-65	65			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-69	69			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
	B14-75	75			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	<0.3
B15/MW07	B15-30	30	05/26/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-65	65			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
	B15-70	70			<2	<50	<250	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	ND
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

SoundEarth Strategies

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B16	B16-06	6	09/26/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.38**	--
	B16-11	11			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B16-16	16			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.051**	--
	B16-17	17			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B16-18	18			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B16-20	20			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B16-22	22			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B16-23.5	23.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.18**	--
	B16-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.085**	--
	B16-29	29			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B16-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.028	--
	B16-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B16-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B16-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.046	--
	B16-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.18**	--
	B16-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B16-65	65	09/27/11		--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B16-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.043	--
B17	B17-06	6	09/27/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.046	--
	B17-11	11			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.053**	--
	B17-16	16			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.14**	--
	B17-21	21			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B17-26	26			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.030	--
	B17-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B17-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.030	--
	B17-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.076**	--
	B17-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.082**	--
	B17-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.042**	--
	B17-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.047**	--
	B17-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.062**	--
	B17-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.067**	--
	B17-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B17-75	75			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B17-80	80			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B18	B18-25	25	09/28/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.12**	--
	B18-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.059**	--
	B18-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.054**	--
	B18-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.11**	--
	B18-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.072**	--
	B18-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.12**	--
	B18-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.11**	--
	B18-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.12**	--
	B18-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.11**	--
	B18-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.027	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B19	B19-25	25	09/29/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.11**	--
	B19-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B19-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B20	B20-15	15	09/29/11	SoundEarth	**2,200**	--	--	**<0.1**	<0.1	4.6	**22**	<0.05	<0.05	<0.05	<0.05	<0.03	**0.22**	--
	B20-20	20	09/30/11		<2	--	--	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-25	25			**34**	--	--	<0.02	<0.02	0.061	0.30	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-30	30			<2	--	--	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-35	35			<2	--	--	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B20-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B21	B21-05	5	09/30/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.28**	--
	B21-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-20	20	10/04/11		--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B21-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B22	B22-05	5	10/03/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B22-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B23	B23-05	5	10/05/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B23-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B24	B24-05	5	10/05/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-55	55	10/06/11		--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B24-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B25	B25-05	5	10/06/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B25-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B26/MW08	B26-05	5	10/07/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-80	80			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-90	90	10/10/11		--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-100	100			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B26-110	110			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B27/MW09	B27-20	20	10/11/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-80	80			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-90	90	10/12/11		--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-100	100			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B27-110	110			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

SoundEarth Strategies

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B28/MW10	B28-05	5	10/10/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-75	75			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-80	80			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-85	85			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B28-90	90			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B29	B29-15	15	10/10/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-25	24			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B29-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B30/MW11	B30-15	15	10/11/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-16.5	16.5			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B30-18	18			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.026	--
	B30-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-21.5	21.5			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-23	23			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B30-24	24			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B30-30	30			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B30-35	35			3.4	--	--	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-40	40			**730**	--	--	<0.1	<0.1	1.5	5.9	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-45	45			<2	--	--	<0.02	<0.02	<0.02	<0.06	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-75	75			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-80	80			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B30-83	83			--	--	--	--	--	--	--	--	--	--	--	--	--	--
B31/MW12	B31-80	80	10/13/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B31-85	85			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B31-90	90			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B31-95	95			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B31-100	100			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B32	--	--	--	AESI	Geotech Boring - no samples collected													
B33	B33-05	5	10/13/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B33-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B34	B34-25	25	10/14/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.029	--
	B34-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B34-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B35	B35-05	5	10/14/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B35-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B36	B36-05	5	10/17/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-10	10			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-15	15			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.028	--
	B36-20	20			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B36-25	25			--	--	--	--	--	--	--	--	--	--	--	--	--	--
	B36-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	0.039	--
	B36-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	**0.099**	--
	B36-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B36-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

Table 1
Summary of Soil Analytical Data for Petroleum and VOCs
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)													
					GRPH^{1}	DRPH^{2}	ORPH^{2}	Benzene^{3}	Toluene^{3}	Ethylbenzene^{3}	Total Xylenes^{3}	Vinyl Chloride^{3}	cis-1,2-DCE^{3}	Trans-1,2-DCE^{3}	EDC^{3}	TCE^{3}	PCE^{3}	SVOCs^{4,5}
B37/MW13	B37-15	15	10/18/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-20	20			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-25	25			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-30	30			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-35	35			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-40	40			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-45	45			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-50	50			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-55	55			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-60	60			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-65	65			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-70	70			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-75	75			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-80	80			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B37-85	85			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B38/MW14	B38-95	95	10/19/11	SoundEarth	--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B38-100	100			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B38-105	105			--	--	--	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B39	B39-3-4	3-4	01/16/12	AECOM	--	--	--	--	--	--	--	<0.0011	0.0029	<0.0011	<0.0011	0.0077	**5.1**	--
	B39-7-8	7-8			--	--	--	--	--	--	--	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	**0.088**	--
	B39-11-12	11-12			--	--	--	--	--	--	--	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	0.049	--
B40	B40-7-8	7-8	01/16/12	AECOM	--	--	--	--	--	--	--	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	0.0017	--
	B40-11-12	11-12			--	--	--	--	--	--	--	<0.0011	<0.0011	<0.0011	<0.0011	<0.0011	0.0013	--
B41	B41-7-8	7-8	01/16/12	AECOM	--	--	--	--	--	--	--	<0.0009	<0.0009	<0.0009	<0.0009	0.0015	**0.180**	--
	B41-11-12	11-12			--	--	--	--	--	--	--	<0.0013	<0.0013	<0.0013	<0.0013	<0.0013	**0.130**	--
B42	B42-3-4	3-4	01/16/12	AECOM	--	--	--	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	**0.053**	--
	B42-7-8	7-8			--	--	--	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.0012	0.028	--
B43	B43-3-4	3-4	01/16/12	AECOM	--	--	--	--	--	--	--	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	**0.220**	--
	B43-7-8	7-8			--	--	--	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.015	--
B44	B44-3-4	3-4	01/16/12	AECOM	--	--	--	--	--	--	--	<0.0009	0.019	<0.0009	<0.009	0.01	**1.7**	--
	B44-7-8	7-8			--	--	--	--	--	--	--	<0.0011	0.0013	<0.0011	<0.0011	**0.092**	**5.6**	--
	B44-11-12	11-12			--	--	--	--	--	--	--	<0.0011	<0.0011	<0.0011	<0.0011	0.0009	**0.057**	--
	B44-11-12	15-16			--	--	--	--	--	--	--	<0.0011	<0.0011	<0.0011	<0.0011	0.0007	0.045	--
B45	B45-3-4	3-4	01/16/12	AECOM	--	--	--	--	--	--	--	<0.0011	<0.063	<0.001	<0.001	0.0033	**7.7**	--
	B45-7-8	7-8			--	--	--	--	--	--	--	<0.0015	0.015	<0.0015	<0.0015	**0.035**	**11**	--
	B45-11-12	11-12			--	--	--	--	--	--	--	<0.001	0.0068	<0.001	<0.001	0.018	**6.4**	--
	B45-11-12	15-16			--	--	--	--	--	--	--	<0.0012	0.0006	<0.0012	<0.0012	0.0015	**0.078**	--
MTCA Cleanup Level					**100/30^{a,b}**	**2,000^{b}**	**2,000^{b}**	**0.03^{b}**	**7^{b}**	**6^{b}**	**9^{b}**	**0.67^{c}**	**160^{d}**	**1,600^{d}**	**11^{c}**	**0.03^{b}**	**0.05^{b}**	**NE**

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Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Sample Location	Sample ID	Depth (feet)	Date Sampled	Sampled By	Analytical Results (mg/kg)														
					GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Vinyl Chloride[3]	cis-1,2-DCE[3]	Trans-1,2-DCE[3]	EDC[3]	TCE[3]	PCE[3]	SVOCs[4,5]
B49	B49-36	36	12/05/12	SoundEarth	<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B49-41	41			<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B48-46	46			<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
B50	B50-06	6	12/06/12	SoundEarth	<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B50-11	11			<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B50-81	81	12/07/12		<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
	B50-84	84			**2,500**	--	--	<0.03	<0.05	0.93	5	<0.05	0.12	<0.05	<0.05	**0.10**	**2.3**	--
	B50-86	86			**170**	--	--	<0.03	<0.05	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.03	**0.14**	--
	B50-91	91			<2	--	--	<0.03	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.03	<0.025	--
MTCA Cleanup Level					**100/30[a,b]**	**2,000[b]**	**2,000[b]**	**0.03[b]**	**7[b]**	**6[b]**	**9[b]**	**0.67[c]**	**160[d]**	**1,600[d]**	**11[c]**	**0.03[b]**	**0.05[b]**	**NE**

NOTES:

Red denotes concentration exceeds MTCA Soil cleanup level.

[1] Analyzed by NWTPH Method NWTPH-Gx.

[2] Analyzed by NWTPH Method NWTPH-Dx.

[3] Analyzed by EPA Method 8260C or 8021B.

[4] Analyzed by EPA Method 8270C.

[5] Bis(2-ethylhexyl) phthalate was the only SVOC detected, the concentrations of which are well below the MTCA Method B cleanup level of 71 mg/kg. The reported results are the highest laboratory detection limit for all SVOCs analyzed or the concentration of (2-bis(2-ethylhexyl) phthalate, if detected in the sample.

[a] 100 mg/kg when benzene is not present and 30 mg/kg when benzene is present.

[b] MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of WAC, revised November 2007.

[c] MTCA Cleanup Regulation, Chapter 173-340 of WAC, CLARC, Soil, Method B, Carcinogen, Standard Formula Value, CLARC Website <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.

[d] MTCA Cleanup Regulation, Chapter 173-340 of WAC, CLARC, Soil, Method B, Non-Carcinogen, Standard Formula Value, CLARC Website <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.

Laboratory notes:

[x] The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

-- = not analyzed, measured, or calculated
< = analytical result does not exceed laboratory reporting limit
AECOM = AECOM Technology Corporation
AESI = Associated Earth Sciences, Inc.
CLARC = cleanup levels and risk calculations
DCE = dichloroethene
DRPH = diesel-range petroleum hydrocarbons
EDC = 1,2-dichloroethane (ethylene dichloride)
EPA = U.S. Environmental Protection Agency
GRPH = gasoline-range petroleum hydrocarbons
mg/kg = milligrams per kilogram
MTCA = Washington State Model Toxics Control Act
ND = not detected above the laboratory reporting limit
NE= not established
NR = not reported
NWTPH = northwest total petroleum hydrocarbon
ORPH = oil-range petroleum hydrocarbons
PCE = tetrachloroethylene
SoundEarth = SoundEarth Strategies, Inc.
SVOC = semi-volatile organic compound
TCE = trichloroethylene
VOCs = volatile organic compounds
WAC = Washington Administrative Code

SoundEarth Strategies

Table 2
Summary of Groundwater Data
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

								Analytical Results (µg/L)																						
Sample Location	Screen Interval[1] (feet)	TOC Elevation[2] (feet)	Sample Date	Sampled By	Date of Depth to Water Measurement	Depth to Water (feet below TOC)	Groundwater Elevation (feet)	GRPH[3]	DRPH[4]	ORPH[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]	Vinyl Chloride[5]	cis-1-2-DCE[5]	trans-1-2-DCE[5]	EDC[5]	TCE[5]	PCE[5]	SVOCs[6,7]	Total Arsenic[8]	Total Barium[9]	Total Cadmium[9]	Total Chromium[9]	Total Lead[10]	Total Selenium[11]	Total Silver[9]	Total Mercury[12]	pH[13]
Supply Well[14]	Unknown	--	10/11/94	RETEC	10/11/94	73	--	420[f]			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	13	<5.0	49	<5.0	<10	4.4	<5.0	<5.0	<2	9.38
			08/26/10[d]	SoundEarth	08/26/10	75.25	--	<100	<50	<250	<0.035	<1	<1	<3	<0.2	<1	<1	<1	<1	<2	<0.1	3.15	103	<1	1.35	4.84	<1	<1	<0.2	8.90
			08/26/10[e]	SoundEarth	08/26/10	75.25	--	<100	82[x]	370	<0.035	<1	<1	<3	<0.2	<1	<1	<1	<1	<2	<0.1	2.56	63.4	<1	1.11	2.85	<1	<1	<0.2	8.95
P10	19-21	--	10/07/10	SoundEarth	10/07/10	20	--	170	**940**[x]	<250	<0.35	<1	<1	<3	<0.2	**67**	<1	<1	**15**	**80**	--	--	--	--	--	--	--	--	--	--
B07	23-24	--	12/08/10	SoundEarth	12/08/10	23	--	**2,300**	310	200	NR	NR	NR	NR	NR	**920**	1.5	NR	**130**	**4,600**	--	--	--	--	--	--	--	--	--	--
B14	N/A	--	05/27/11	SoundEarth	05/27/11	69	--	<100	**590**	370[x]	<1	<1	<1	<3	<0.2	12	<1	<1	**8.8**	**35**	<2	--	--	--	--	--	--	--	--	--
MW01	45-60	68.68	05/25/11	SoundEarth	05/25/11	50.59	18.09	<100	<50	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--
			10/11/11	SoundEarth	10/20/11	51.03	17.65	<100	<50	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	51.24	17.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW02	55-70	70.92	05/25/11	SoundEarth	05/25/11	54.84	16.08	<100	100[x]	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	**5.2**	<1	9.3	--	--	--	--	--	--	--	--	--
			10/11/11	SoundEarth	10/20/11	55.08	15.84	<100	<50	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	3.0	<1	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	55.27	15.65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW03	65-80	84.65	05/27/11	SoundEarth	05/27/11	68.75	15.90	<100	130[x]	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	2.8	--	--	--	--	--	--	--	--	--
			10/11/11	SoundEarth	10/20/11	68.97	15.68	<100	<50	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	69.21	15.44	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW04	50-65	70.69	05/27/11	SoundEarth	05/27/11	52.22	18.47	<100	<50	<250	<1	1.3	<1	<3	<0.2	<1	<1	<1	**15**	<1	1.7	--	--	--	--	--	--	--	--	--
			10/12/11	SoundEarth	10/20/11	52.82	17.87	<100	<50	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	**15**	<1	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	52.88	17.81	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW05	65-80	84.04	05/27/11	SoundEarth	05/27/11	67.40	16.64	<100	<50	<250	<1	<1	<1	<3	<0.2	1.8	<1	<1	**16**	**39**	2.0	--	--	--	--	--	--	--	--	--
			10/12/11	SoundEarth	10/20/11	67.91	16.13	<100	<50	<250	<1	<1	<1	<3	<0.2	1.5	<1	<1	**14**	**29**	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	68.54	15.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW06	60-75	74.78	05/31/11	SoundEarth	05/31/11	58.70	16.08	<100	330[x]	<250	<1	<1	<1	<3	**0.76**	**150**[ve]	<1	<1	**8.2**	3.1	<10	--	--	--	--	--	--	--	--	--
			10/12/11	SoundEarth	10/20/11	58.91	15.87	<100[g]	83[g,x]	<250[g]	<1[g]	<1[g]	<1[g]	<3[g]	**0.76**	**120**	<1	<1	**11**	3.6	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	58.71	16.07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW07	55-70	74.55	05/31/11	SoundEarth	05/31/11	56.33	18.22	<100	<50	<250	<1	<1	<1	<3	<0.2	2.3	<1	<1	**12**	1.4	<10	--	--	--	--	--	--	--	--	--
			10/12/11	SoundEarth	10/20/11	56.87	17.68	<100	240[x]	<250	<1	<1	<1	<3	<0.2	1.8	<1	<1	**11**	2.2	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	56.96	17.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW08	105-110	92.88	10/13/11	SoundEarth	10/20/11	77.18	15.70	<100	<50	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--
MW09	105-110	92.92	10/13/11	SoundEarth	10/20/11	77.24	15.68	**1,400**	240[x]	<250	<1	<1	2.7	10	<0.2	**22**	<1	<1	**16**	<1	--	--	--	--	--	--	--	--	--	--
MW10	75-90	92.73	10/12/11	SoundEarth	10/20/11	77.14	15.59	<100	68[x]	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	77.01	15.72	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW11	68-83	88.23	10/13/11	SoundEarth	10/20/11	72.43	15.80	<100	110[x]	<250	<1	<1	<1	<3	<0.2	5.6	<1	<1	2.6	**21**	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	72.29	15.94	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW12	95-100	74.44	10/17/11	SoundEarth	10/20/11	58.71	15.73	<100	<50	<250	<1	<1	<1	<3	<0.2	1.3	<1	<1	**19**	<1	--	--	--	--	--	--	--	--	--	--
MW13	70-85	90.66	10/20/11	SoundEarth	10/20/11	74.69	15.97	<100	150[x]	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	1.2	**5.1**	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	75.38	15.28	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW14	90-105	104.40	10/20/11	SoundEarth	10/20/11	88.81	15.59	<100	160[x]	<250	<1	<1	<1	<3	<0.2	<1	<1	<1	<1	<1	--	--	--	--	--	--	--	--	--	--
			12/10/12	SoundEarth	12/10/12	88.66	15.74	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MTCA Cleanup Level								**1,000/800**[a,b]	**500**[b]	**500**[b]	**5**[b]	**1,000**[b]	**700**[b]	**1,000**[b]	**0.2**[b]	**16**[c]	**160**[c]	**5**[b]	**5**[b]	**5**[b]	**N/A**	**5**[b]	**3,200**[c]	**5**[b]	**50**[b]	**15**[b]	**80**[c]	**80**[c]	**2**[b]	**N/A**

Table 2
Summary of Groundwater Data
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

									Analytical Results (µg/L)																							
Sample Location	Screen Interval[1] (feet)	TOC Elevation[2] (feet)	Sample Date	Sampled By	Date of Depth to Water Measurement	Depth to Water (feet below TOC)	Groundwater Elevation (feet)	GRPH[3]	DRPH[4]	ORPH[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]	Vinyl Chloride[5]	cis-1-2-DCE[5]	trans-1-2-DCE[5]	EDC[5]	TCE[5]	PCE[5]	SVOCs[6,7]	Total Arsenic[8]	Total Barium[9]	Total Cadmium[9]	Total Chromium[9]	Total Lead[10]	Total Selenium[11]	Total Silver[9]	Total Mercury[12]	pH[13]
MW15	41-56	58.79	12/21/12	SoundEarth	12/10/12	40.78	18.01	<100	--	--	<0.35	<1	<1	<3	<0.2	<1	<1	<1	**7.2**	<1	--	--	--	--	--	--	--	--	--	--
MW16	91-106	99.02	12/11/12	SoundEarth	12/10/12	83.19	15.83	640	--	--	<0.35	<1	<1	1.1	**0.69**	**220**	<1	<1	**12**	**16**	--	--	--	--	--	--	--	--	--	--
MTCA Cleanup Level								**1,000/800[a,b]**	**500[b]**	**500[b]**	**5[b]**	**1,000[b]**	**700[b]**	**1,000[b]**	**0.2[b]**	**16[c]**	**160[c]**	**5[b]**	**5[b]**	**5[b]**	**N/A**	**5[b]**	**3,200[c]**	**5[b]**	**50[b]**	**15[b]**	**80[c]**	**80[c]**	**2[b]**	**N/A**

NOTES:

Red denotes concentration exceeds MTCA Method cleanup level for groundwater.

[1] Range of feet is measured from top to bottom of the screen below ground surface.

[2] TOC elevations originally surveyed by SoundEarth relative to an arbitrary benchmark with an assumed elevation of 100.00 feet. TOC elevations were resurveyed by Triad Associates on October 20, 2011 relative to the North American Vertical Datum of 1988.

[3] Analyzed by EPA Method 418.1 or Method NWTPH-Gx .

[4] Analyzed by NWTPH-Dx. The supply well samples collected in August 2010, were passed through a silica gel column prior to analysis to remove organic interference.

[5] Analyzed by EPA Method 8260C, 8021B or 8240.

[6] Analyzed by EPA Method 8270 or 8270D.

[7] Phenol was detected in the supply well sample collected in 1994 and Dimethyl phthalate was detected in samples collected from monitoring wells MW02 through MW05. The relative concentrations are presented on this table. Phenol has a MTCA Method B cleanup level of 2,400 µg/L and Dimethyl phthalate does not have a MTCA Method A or B cleanup level.

[8] Analyzed by EPA Method 7060 or 200.8.

[9] Analzed by EPA Method 6010 or 200.8.

[10] Analzed by EPA Method 7421 or 200.8.

[11] Analzed by EPA Method 7740 or 200.8.

[12] Analzed by EPA Method 7470 or 1631E.

[13] Analyzed by EPA Method 9040c or in the field.

[14] The supply well was decommissioned on July 26, 2010 by Richardson Well Drilling of Puyallup, Washington.

[a] 1,000 µg/L when benzene is not present and 800 µg/L when benzene is present.

[b] MTCA Method A Cleanup Levels, Table 720-1 of Section 900 of Chapter 173-340 of WAC, revised November 2007.

[c] MTCA Cleanup Regulation, Chapter 173-340 of WAC, CLARC, Groundwater, Method B, Non-Carcinogen, Standard Formula Value, CLARC Website <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.

[d] Reconnaissance groundwater sample collected at an approximate depth of 75 feet below the observed depth to water.

[e] Reconnaissance groundwater sample collected at an approximate depth of 490 feet below the observed depth to water.

[f] Resultant concentration originally reported as a concentration of total petroleum hydrocarbons.

[g] Samples collected on October 10, 2011.

Laboratory notes:

[x] The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

[ve] Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.

-- = not analyzed, measured, or calculated

< = not detected at a concentration exceeding laboratory reporting limit

µg/L = micrograms per liter

CLARC = Cleanup Levels and Risk Calculations

DCE = dichloroethylene

DRPH = diesel-range petroleum hydrocarbons

EDC = 1,2-Dichloroethane (ethylene dichloride)

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

MTCA = Washington State Model Toxics Control Act

N/A = not applicable

NR = not reported

NWTPH = northwest total petroleum hydrocarbons

ORPH = heavy oil-range petroleum hydrocarbons

PCE = tetrachloroethylene

RETEC = Remediation Technologies of Seattle, Washington

SoundEarth = SoundEarth Strategies, Inc.

SVOCs = semi volatile organic compounds

TCE = trichloroethylene

TOC = top of casing

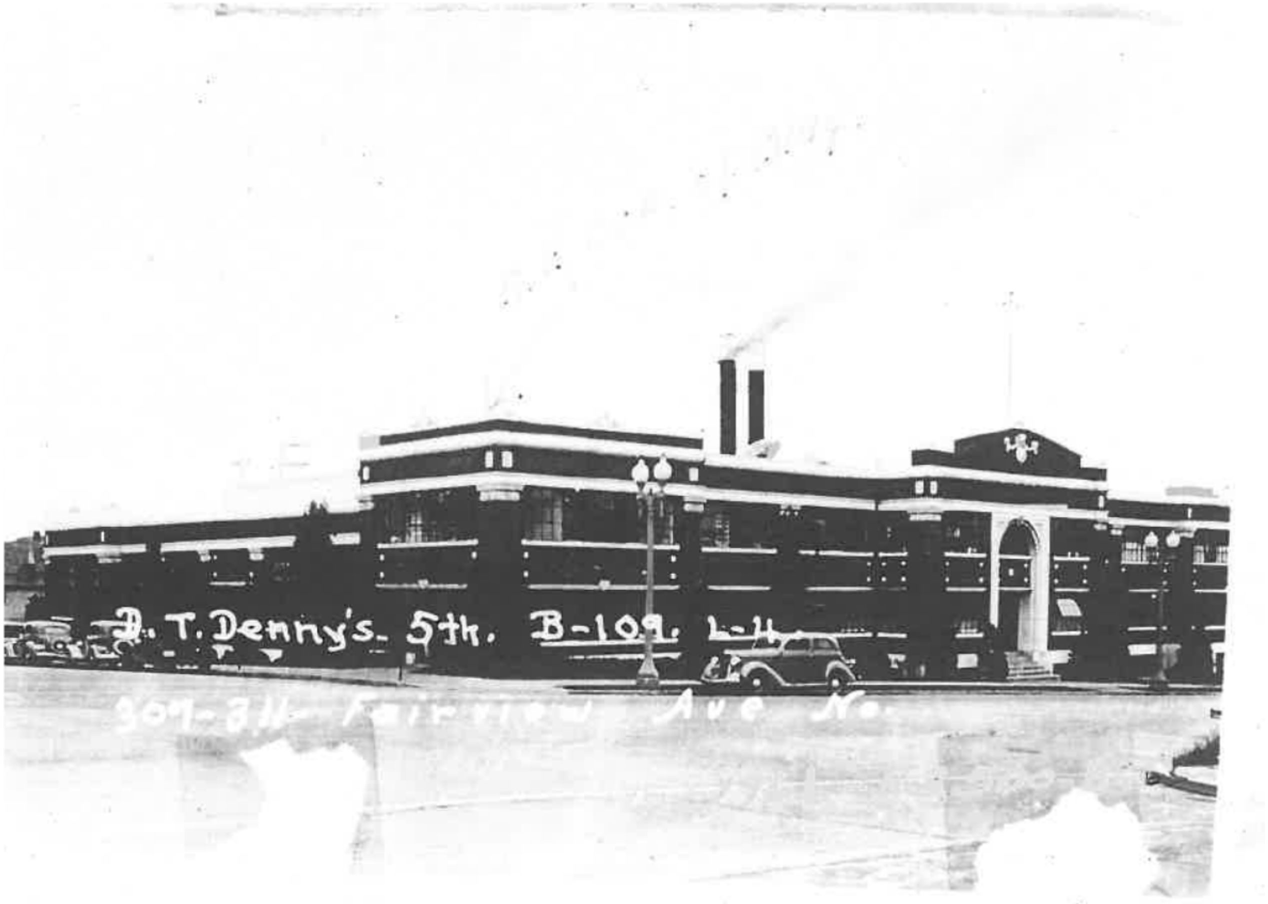
WAC = Washington Administrative Code

APPENDIX A
SAMPLING AND ANALYSIS PLAN

SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102

SAMPLING AND ANALYSIS PLAN

APPENDIX A OF THE DRAFT INTERIM ACTION PLAN



Property:
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington
Ecology Facility ID: 19135499

Prepared for:
Touchstone SLU LLC
2025 First Avenue, Suite 1212
Seattle, Washington

Report Date:
January 30, 2013

Sampling and Analysis Plan

Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington 98121
Ecology Facility ID: 19135499

Prepared for:

Touchstone SLU LLC
2025 First Avenue, Suite 1212
Seattle, Washington 98121

Project No.: 0731-004

Prepared by:

Audrey Hackett
Project Scientist

Hydrogeologist
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Principal Hydrogeologist

October 25, 2012

SoundEarth Strategies

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ACRONYMS AND ABBREVIATIONS

AST	aboveground storage tank
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
cis-1,2-DCE	cis-1,2-dichloroethylene
cfm	cubic feet per minute
COC	chemical of concern
CVOC	chlorinated volatile organic compound
DHC	*Dehalococcoides*
DRPH	diesel-range petroleum hydrocarbons
DQO	data quality objective
Ecology	Washington State Department of Ecology
EOS	edible oil substrate
EPA	U.S. Environmental Protection Agency
FC	field coordinator
GRPH	gasoline-range petroleum hydrocarbons
HASP	Health and Safety Plan
IAP	Draft Interim Action Plan
ID	identifier
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
MTCA	Washington State Model Toxics Control Act
NWTPH	Northwest Total Petroleum Hydrocarbon
ORPH	oil-range petroleum hydrocarbons

ACRONYMS AND ABBREVIATIONS (CONTINUED)

PCE	tetrachloroethylene
PQL	practical quantitation limit
the Property	307 Fairview Avenue North, Seattle Washington
QC	quality control
QA/QC	quality assurance/quality control
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
RPD	relative percent difference
SAP	Sampling and Analysis Plan
the Site	soil, soil vapor, and groundwater contaminated with gasoline-, diesel-, and oil-range petroleum hydrocarbons; tetrachloroethylene; trichloroethylene; cis-1,2-dichloroethylene; and/or vinyl chloride beneath the Property, as well as beneath portions of the Boren Avenue North and Thomas Street rights-of-way, as well as trichloroethylene in the Terry Avenue North right-of-way
SVE	soil vapor extraction
SoundEarth	SoundEarth Strategies, Inc.
TCE	trichloroethylene
Touchstone	Touchstone SLU LLC
TSDF	treatment, storage, and disposal facility
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code

1.0 INTRODUCTION

SoundEarth Strategies, Inc. (SoundEarth) has prepared this Sampling and Analysis Plan (SAP) for the Troy Laundry Property located at 307 Fairview Avenue North in Seattle, Washington (the Property; Figure A-1). In accordance with the Washington State Model Toxics Control Act (MTCA) Cleanup Regulations as established in Section 200 of Chapter 173-340 of the Washington Administrative Code (WAC 173-340-200), the Site is defined by the full lateral and vertical extent of contamination that has resulted from the former operation of a dry cleaning facility on the Property. Based on the information gathered to date, the Site includes soil, soil vapor, and/or groundwater contaminated with gasoline-, diesel-, and oil-range petroleum hydrocarbons (GRPH, DRPH, and ORPH, respectively); tetrachloroethylene (PCE); trichloroethylene (TCE); cis-1,2-dichloroethylene (cis-1,2-DCE); and/or vinyl chloride beneath the Property, as well as beneath portions of the Boren Avenue North and Thomas Street rights-of-way (ROWs), as well as trichloroethylene in the Terry Avenue North ROW.

This SAP was prepared under the authority of Agreed Order No. DE 8996 between Touchstone SLU LLC (Touchstone) and the Washington State Department of Ecology (Ecology) and was developed to meet the requirements of a SAP as defined by MTCA (WAC 173-340-820).

1.1 PURPOSE AND OBJECTIVES

The purpose of the SAP is to describe the sample collection, handling, and analysis procedures to be implemented during the cleanup action in accordance with WAC 173-340-380 of MTCA. This SAP identifies specific sampling and analysis protocols, project schedule, and organization and responsibilities. It also provides detailed information regarding the sampling and data quality objectives, sample location and frequency, equipment, and procedures to be used during the cleanup action; sample handling and analysis; procedures for management of waste; quality assurance protocols for field activities and laboratory analysis; and reporting requirements.

1.2 SAMPLING AND ANALYSIS PLAN ORGANIZATION

The SAP is organized into the following sections:

- **Section 1.0, Introduction.** This section describes the purpose of the SAP and provides a description of the Property features and location, a brief summary of the current and historical uses of the Property, and a summary of the results of previous investigations conducted at the Site.
- **Section 2.0, Project Organization and Management.** This section presents the project team, including field personnel and management.
- **Section 3.0, Interim Action Plan Field Program.** This section presents the cleanup action objectives and construction activity summary.
- **Section 4.0, Sample Handling and Quality Control Procedures.** This section describes the sample handling techniques and quality assurance procedures that will be followed during the cleanup action.
- **Section 5.0, Analytical Testing.** This section describes the type and number of sample analyses that will be conducted on soil, groundwater, and process water samples during the cleanup action.

- **Section 6.0, Management of Investigation-Derived Waste.** This section provides details on handling and disposal procedures that will be implemented during the cleanup action.
- **Section 7.0, Data Quality Objectives.** This section summarizes the data quality objectives that will need to be met to ensure the validity of the analytical results.
- **Section 8.0, Data Collection.** This section describes the type, transfer, inventory management, and validation procedures of the data that will be gathered during the cleanup action.
- **Section 9.0, Quality Control Procedures.** This section provides details regarding the quality control (QC) procedures for both field activities and laboratory analysis.
- **Section 10.0, Corrective Actions.** This section identifies the approaches that will be used to correct any protocols that may compromise the quality of the data.
- **Section 11.0, Documentation and Records.** This section outlines the documentation that will be prepared during the cleanup action. It includes a discussion of document management, waste disposal tracking, and compliance reports.
- **Section 12.0, Health and Safety Procedures.** This section summarizes the health and safety procedures outlined in the project-specific Health and Safety Plan (Appendix B of the cleanup action plan [IAP]).

1.3 BACKGROUND

This section provides a description of the Property features and location, a summary of historical Property use, and a summary of previous investigations conducted at the Property and adjoining parcels and ROWs.

1.3.1 Property Location and Description

The Property is comprised of two tax parcels (King County parcel numbers 198620-0480 and 198620-0515) that cover approximately 108,571 square feet (2.5 acres) of land. The Property is listed as 307 Fairview Avenue North in Seattle, Washington. Touchstone currently owns the Property.

The Property is improved with three buildings (Figure A-2). The 1925-vintage, single-story masonry warehouse building listed at 334 Boren Avenue North (David Smith Building) is used as a sales floor and storage for David Smith Antiques, a home furnishings retailer and wholesaler. The masonry-framed structure has a tar and gravel roof and is heated by space heaters.

The original 1927-vintage building at 307 Fairview Avenue North (Troy Building) is presently used as storage space for Integrity Interior Solutions, as well as storage for David Smith Antiques. The current, expanded structure was formerly the main location of the Troy Laundry and commercial dry cleaning operations. The masonry-framed structure has a tar and gravel roof and is heated by a hot water furnace. Troy Building additions, which were constructed between 1943 and 1966, were formerly used for industrial laundry, fur storage (Fur Vault), a tumbling and cleaning area on the western portion of the Property, and a two-story reinforced concrete parking garage on the southwestern portion of the Property. The reinforced concrete structure is heated using space heaters.

1.4 PROPERTY HISTORY

The Property was initially developed prior to 1893 with residences. Residences exclusively occupied the Property until 1925, when the David Smith Building was constructed on the northwestern corner of the Property. The Troy Building was constructed between 1926 and 1927, and the Mokas Building was constructed in 1960. According to historical records, by 1948, the Property operated as one of the Pacific Northwest's largest laundry and dry cleaning facilities. At least 15 underground storage tanks (USTs) containing heating oil, fuel, and dry cleaning solvents, as well as several aboveground storage tanks (ASTs) containing propane, wash water, water-softening agents, dry cleaning solvents, and heating oil, were used on the Property.

1.4.1 Summary of Previous Investigations

The results of previous subsurface investigations, the remedial investigation, and the supplemental remedial investigation conducted at the Site suggest that the chlorinated solvent impacts confirmed in soil and/or groundwater beneath the Property and portions of the Boren Avenue North and Thomas Street rights-of-way are the result of a release from the laundry and dry cleaning facility that operated on the Property from 1927 through 1985. Although the type and location of dry cleaning operations conducted on the Property prior to 1964 could not be confirmed, historical building plans indicated that the bulk of the dry cleaning operations after the mid-1960s were conducted on the southwest portion of the Property. Consistent with this information, the highest concentrations of chlorinated solvents are located near the center of the Property by the loading dock. In addition, a deep zone (84 to 86 feet below ground surface) of soil contamination has been identified within Thomas Street. The source of the contamination has not been confirmed and is inconsistent with data and observations associated with earlier investigations conducted on the Property and within the adjoining ROWs.

Concentrations of PCE and its degradation products within the primary water-bearing zone, which is located at an approximate elevation of 16 feet above mean sea level, while above the applicable cleanup levels, are relatively low and fairly consistent across the Site. PCE was detected in the monitoring well installed near the source area (MW11), as well as two of the wells completed within the Boren Avenue North right-of-way. Concentrations of cis-1,2-DCE were confirmed above the cleanup level only in wells MW06 and MW09, and vinyl chloride was detected only in well MW06. Concentrations of TCE were detected above the cleanup level in groundwater samples collected from monitoring wells MW09 and MW12, which were screened 25 to 30 feet below the top of the primary water-bearing zone. The concentrations are consistent with those observed in other, shallower wells screened at the top of the primary water-bearing zone throughout the Site.

The highest concentrations of tetrachloroethylene in soil are present beneath the center of the Property at depths ranging from 3 to 10 feet below ground surface. A very dense silt layer was encountered at depths between 12 and 20 feet below ground surface. The majority of the tetrachloroethylene contamination across the Property appears to be above the silt layer as evidenced by the significant drop in tetrachloroethylene concentrations within and beneath the silt (boring/sample P08-10 and P08-14). Considering the associated high concentration of tetrachloroethylene in the perched reconnaissance water sample collected from temporary boring B07 using push-probe technology, the presence of tetrachloroethylene as dense nonaqueous-phase liquid above this silt layer is probable.

Relatively consistent concentrations of PCE in soil appear to have migrated from the primary source area at the Property throughout the western half of the Property primarily through diffusion. Any migration upgradient of the source likely resulted from vapor-phase transport in the vadose zone over several years, as evidenced by the GORE Survey results and facilitated by the relatively loose sandy geology beneath those portions of the Site.

With the exception of the contamination found beneath Thomas Street between 84 and 86 feet below ground surface, tetrachloroethylene has generally migrated vertically through soil to depths of up to 65 feet below ground surface, or approximately 10 to 15 feet above the primary water-bearing zone, in the areas explored. Tetrachloroethylene contamination in soil extends east up to approximately the centerline of the Property, and it has migrated westerly up to the Property boundary. Based on the results of soil analytical data collected on and to the west of the Property, any soil contamination extending into the adjoining Boren Avenue North right-of-way is likely limited in extent.

GRPH as Stoddard solvent was also observed in soil and groundwater beneath the Site. In all samples where concentrations of GRPH exceeded the MTCA Method A cleanup level in soil and groundwater, chlorinated solvents were also present.

1.5 CLEANUP ACTION PLAN TASK DESCRIPTIONS

The tasks proposed as part of the IAP include the following:

- Site preparation and mobilization
- Well decommissioning
- Shoring installation
- UST site assessment and closure
- Excavation
- Construction dewatering
- Soil vapor extraction (SVE) system design
- SVE well installation
- SVE system operation and maintenance
- Groundwater injection system design
- Injection and monitoring well installation
- Injection and bioaugmentation
- Injection, SVE, and monitoring well and system decommissioning
- Compliance monitoring (vapor, soil, and groundwater sampling)

A summary of the Draft Interim Action Plan (IAP) schedule is provided in Table A-1.

2.0 PROJECT ORGANIZATION AND MANAGEMENT

This section describes the overall project management strategy for implementing the cleanup action.

To ensure efficient decision making for field sampling and laboratory analysis, key data collection decisions, decision criteria, process for decision making, Quality Assurance/Quality Control (QA/QC) procedures, and responsibilities are described below and detailed in Table A-2.

These decision and communication plans will be followed by field personal under direction of the field coordinator and task manager. Site quality control to ensure proper communication and adherence to this SAP is discussed below in Section 9.0.

The cleanup action is being conducted by SoundEarth on behalf of Touchstone. Ecology is providing regulatory guidance of site activities. The following key personnel have been identified for the project. A summary of key personnel roles and responsibilities is provided in Table A-2.

Regulatory Agency. Ecology is the lead regulatory agency for the Site, as promulgated in MTCA. The cleanup action is being conducted as an independent remedial action in accordance with WAC 173-340-515 of MTCA. Ecology's Site Manager for the Project is:

Mr. Russ Olsen
Washington State Department of Ecology
3190 160th Avenue Southeast
Bellevue, Washington 98008
425-649-7038
rols461@ecy.wa.gov

Project Contact. SoundEarth has been contracted by Touchstone to plan and implement the cleanup action at the Site. The Project Contact for Touchstone is:

Mr. Shawn Parry
Touchstone
2025 First Avenue, Suite 1212
Seattle, Washington 98121
206-441-2955
Fax: 206-727-2399
sparry@touchstonecorp.com

Project Principal. The Project Principal provides oversight of all project activities and reviews all data and deliverables prior to their submittal to the Project Contact or Regulatory Agency. The Project Principal for SoundEarth is:

Mr. Berthin Q. Hyde, LG, LHG
SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102
206-306-1900
Fax: 206-306-1907
bqhyde@soundearthinc.com

Project Manager. The Project Manager has overall responsibility for developing the SAP, monitoring the quality of the technical and managerial aspects of the cleanup action, and implementing the SAP and corresponding corrective measures, where necessary. The Project Manager for SoundEarth is:

Ms. Erin K. Rothman
SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102
206-306-1900
Fax: 206-306-1907
erinr@soundearthinc.com

Laboratory Project Manager. The Laboratory Project Manager will provide analytical support and will be responsible for providing certified, pre-cleaned sample containers and sample preservatives (as appropriate) and for ensuring that all chemical analyses meet the project quality specifications detailed in this SAP. Friedman and Bruya Inc., of Seattle, Washington, has been contracted by Touchstone to perform the chemical and physical analysis for compliance samples collected during the cleanup action. The Laboratory Project Manager is:

Mr. Mike Erdahl
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, Washington 98119
206-285-8282
merdahl@friedmanandbruya.com

Project QA/QC Officer. The Project QA/QC Officer has the responsibility to monitor and verify that the work is performed in accordance with the SAP and other applicable procedures. The Project QA/QC Officer has the responsibility to assess the effectiveness of the QA/QC program and to recommend modifications to the program when applicable. The Project QA/QC Officer is responsible for assuring that the personnel assigned to the project are trained relative to the requirements of the QA/QC program and for reviewing and verifying the disposition of nonconformance and corrective action reports. The Project QA/QC Officer for SoundEarth is:

Ms. Audrey Hackett
SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102
206-306-1900
Fax: 206-306-1907
ahackett@soundearthinc.com

Field Coordinator. The Field Coordinator (FC) will supervise field collection of all samples. The FC will ensure proper recording of sample locations, depths, and identification; sampling and handling requirements, including field decontamination procedures; physical evaluation and logging of samples; and completing of chain-of-custody forms. The FC will ensure that all field staff follows the SAP, will ensure that the physical evaluation and logging of soil is based on the visual-manual classification method American Society for Testing and Materials D-2488, and will adhere to standardized methods for sample acceptability and physical description of samples. The FC will ensure that field staff maintain records of field sampling events using the forms included as Attachment A of this SAP. The FC will be responsible for proper completion and storage of field forms. The FC for SoundEarth is:

Mr. Chris Cass, LG
SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102
206-306-1900
Fax: 206-306-1907
ccass@soundearthinc.com

Field Staff. Members of the field staff must understand and implement the QA/QC program, coordinate and participate in the field sampling activities, coordinate sample deliveries to laboratory, and report any deviations from project plans as they relate to the cleanup action objectives as presented in the SAP. Major deviations from the SAP, such as the inability to collect a sample from a specific sampling location, obtaining an insufficient sample volume for the required analyses, or a change in sampling method, must be reported to the Project Manager.

Subcontractors. All subcontractors will follow the protocols outlined in this SAP and will be overseen and directed by SoundEarth. The following subcontractors have been identified:

Private Utility Locator:

Mr. Kemp Garcia
Bravo Environmental
6437 South 144th Street
Tukwila, Washington
425-424-9000

Site Superintendent/General Contractor:

Mr. Jeff Cleator
Lease Crutcher Lewis
107 Spring Street
Seattle, Washington
206-689-0493

3.0 CLEANUP ACTION PLAN FIELD PROGRAM

The objectives of the interim action for the Site have been established in consideration of the future redevelopment and land use of the Property and include the following:

- Excavate on-Property soil containing PCE and other chemicals of concern (COCs) at concentrations that present a risk to human health and the environment.

- Use in situ treatment methods to reduce COCs in groundwater during redevelopment to take advantage of the efficiencies available during ongoing excavation activities and to avoid conflicts with future planned land use.
- Prevent further off-Property migration of COCs at concentrations exceeding cleanup levels.
- Provide engineering controls to prevent the unacceptable risks to human health posed by COCs in groundwater until cleanup levels are achieved.
- Acquire phased completion letters from Ecology indicating the successful implementation of the interim action.
- Ultimately acquire a Covenant Not to Sue for the Site.

A discussion of the field program is provided in the following sections.

3.1 CONTAMINATED SOIL EXCAVATION

The bulk excavation will commence after the completion of the following items:

- Acquiring a contained-in determination and profiling for waste disposal from Ecology.
- Installing Temporary Erosion and Sediment Control measures.
- Establishing site security and fencing.
- Demolishing existing buildings.
- Preparing ingress and egress pathways.
- Decommissioning monitoring wells within the Remedial Excavation Area.
- Installing the shoring system.
- Setting up a storage tank to contain groundwater removed from the shallow perched area, surface water runoff/infiltration, and construction dewatering for off-site treatment and disposal.

Existing soil analytical data would be used to direct the real-time segregation and loading of haul trucks based on the following categories:

- **Dangerous Waste Soil Suitable for Land Disposal.** Soil exhibiting PCE concentrations greater than 1.9 milligrams per kilogram (mg/kg) but less than 60 mg/kg is designated as dangerous waste that is suitable for land disposal in an approved Resource Conservation and Recovery Act (RCRA) Subtitle C facility without further treatment. The 1.9 mg/kg value is considered protective of the direct contact pathway. The estimated quantity of this material, based on existing analytical data, is 340 tons.
- **Nondangerous Soil.** Soil exhibiting PCE concentrations below the MTCA Method B cleanup level of 1.9 mg/kg but above the laboratory detection limit (0.025 mg/kg) as sourced from an F-listed waste material requires disposal as RCRA hazardous waste. In accordance with Ecology’s concurrence, the soil could potentially be disposed of at a Subtitle D landfill as nonhazardous waste following Ecology’s contained-in determination. The estimated quantity of this material based on existing analytical data and incorporating approximate clean overburden calculations is 97,200 tons.

The excavation contractor will use a soil management grid, which breaks the entire Remedial Excavation Area into 10-foot by 10-foot grid cells, to readily identify and classify each grid cell for proper off-Site disposal and establish a trucking and disposal approach in accordance with the pre-classification of the soil that was developed based on the remedial investigation analytical data. A soil management and disposal table that identifies each grid cell and the corresponding soil disposal classification is provided in Appendix C of the IAP.

The excavation will be coordinated to first address the contaminated soil near the center of the source area in an effort to segregate and manage the dangerous waste. Excavation of the soil in this area will be managed carefully to ensure that the impermeable layer on which the contaminated, perched water-bearing zone overlies is not penetrated. Any perched water encountered within the dangerous waste excavation area will be removed from the excavation via dewatering wells and stored in baker tanks pending laboratory analysis and proper disposal.

Once performance samples show that all of the PCE-contaminated soil above 1.9 mg/kg has been removed, the excavation of the remainder of the Remedial Excavation Area will commence in a clockwise fashion. The excavation will progress from the perimeter of the Property inward and will follow the shoring installation and progress in 10-foot lifts. In an effort to minimize the cross-contamination of clean soil, the contractor may use a conveyor belt system to transport excavated material to the truck staging area to be directly loaded and minimize tracking of soil across the site; establish an exclusion zone and place site controls such as tire and truck wash stations at the edge of the exclusion zone; limit the excavation on a daily or weekly basis to only remove contaminated soil to ensure proper decontamination of equipment prior to excavating clean soil; and line the truck and trailers with disposable liners.

3.1.1 Contingency Plan to Address Unknown Contamination

The presence of aesthetic impacts and conditions encountered by site employees and equipment operators during the construction excavation activities at the Site may be indicative of conditions associated with contaminated media. Equipment operators will be instructed to use these criteria to alert the site superintendent and construction manager of potential issues of previously unidentified contamination at the Site in accordance with the communication plan. Any of the following occurrences are considered common sense criteria that may require a mitigation or remediation response. These criteria include, but are not limited to:

- Obvious petroleum staining, sheen, or colored hues in soil or standing water.
- The presence of petroleum products or leachate of other chemicals.
- The presence of utility pipe lines with sludge or trapped liquid indicating petroleum or chemical discharge sludge.
- The presence of buried pipes, conduits, tanks, or unexplained metallic objects or debris.
- Materials with a granular texture that suggests industrial origin.
- Vapors causing eye irritation or nose tingling or burning.
- White, chalky compounds or fine particulate soil layers.
- Presence of gasoline- or oil-like vapor or odor.

- Burnt debris or the presence of slag-like material.

Any criteria identified by on-Site personnel will be evaluated and, as appropriate, a sampling plan will be developed to properly characterize and manage the material in accordance with state and federal regulations.

Several subsurface anomalies were observed during a ground-penetrating radar survey conducted at the Property in 2010. In the event that a UST is encountered during the course of the excavation activities, a UST site assessment will be conducted under the oversight of a Washington state-certified UST site assessor, and the UST will be removed in accordance with the *Guidance for Site Checks and Site Assessment for Underground Storage Tanks* prepared by Ecology and dated February 1991, revised May 30, 2003, Publication No. 90-52, *Underground Storage Tank Regulations* (WAC 173-360), and Ecology's *Guidance for Remediation of Petroleum Contaminated Sites*, Toxics Cleanup Program, Publication No. 10-09-057—September 2011. In the event that impacts to soil are observed, performance and confirmational soil samples will be collected and analyzed to ensure that the contaminated soil is removed and properly characterized prior to disposal.

3.1.2 Construction Dewatering

As discussed above, the contaminated perched groundwater that was observed near the center of the Property will be dewatered prior to starting the excavation activities. This will be accomplished by advancing two to three dewatering wells within the perched zone and pumping the water down until the wells are dry. The water generated will be transferred to a 6,800-gallon polyethylene AST. The storage tank will be located in an area that is accessible for a vacuum truck service to remove the contaminated water and transport it for treatment and disposal off the Site.

Water that is generated from surface water runoff due to precipitation events and any groundwater encountered during the course of the excavation will be gathered at a low point in the excavation as determined by the contractor and pumped to the AST prior to off-Site treatment and disposal. As discussed above, the final elevation of the excavation is anticipated to be between approximately 18 and 38 feet above NAVD88, or approximately 2 feet above the top of the primary water-bearing zone; therefore, extensive dewatering is not anticipated.

3.1.3 Parking Structure

Construction of the subgrade parking structure will commence after the excavation is completed. Architectural details for the project are not currently available; however, preliminary plans are to construct 4 to 5 levels of below-grade parking and a sub-grade retention basin. Footing drains will be completed along the exterior perimeter of the foundation to collect any groundwater that may come into contact with the structure. Considering the depth of the excavation (between approximately 18 and 38 feet above NAVD88), as well as the location of the primary water-bearing zone (approximately 16 feet above NAVD88), any groundwater collected at the footing drains is likely to be limited in volume.

The concrete shoring and foundation system will be constructed to act as a barrier to recontamination and vapor intrusion from the groundwater plume within the ROWs. Any vapor intrusion into the subgrade parking structure will be further mitigated by the venting system typically incorporated into such structures to avoid buildup of carbon monoxide and petroleum fumes generated by running vehicle engines.

3.1.4 Soil Vapor Extraction System Design

The SVE system will utilize a 600 standard cubic feet per minute (cfm) positive displacement blower to apply a vacuum to the network of 11, 2-inch-diameter extraction wells. The SVE system will apply approximately 50 cfm to each extraction well. The air flow recovery and vacuum applied to each well will be controlled using a manifold located in the equipment enclosure. The system will be designed to treat vapor-phase COCs that are recovered by the SVE blower using granular activated carbon to reduce vapor concentrations for discharge to the atmosphere. Any moisture recovered by the SVE system will be separated from the vapor stream by two moisture separators in series. Recovered water will be sampled and characterized for proper disposal.

3.1.5 Soil Vapor Extraction System Operation and Maintenance

Monthly vapor samples will be collected pre- and post-carbon treatment to evaluate mass removal and evaluate whether off-gas treatment is necessary prior to discharging to the atmosphere. Maintenance of the SVE blower and system optimization will be performed monthly. The SVE system will be set up with an autodialer to inform the operator when the system has a failure or has shut down due to system alarm conditions.

3.1.6 Groundwater Injection System Design

A barrier-type edible oil substrate (EOS) design will be applied at the Site with a series of four transects spaced approximately 75 feet apart (a distance equivalent to the distance travelled by the Site groundwater over 3 years) and perpendicular to the groundwater flow direction. Each transect will span the width of the groundwater plume on the Property and will include injection wells placed on 15-foot centers with an overlapping radius of influence of 10 feet. The layout of the system will serve as a barrier to both on- and off-Site migration of contaminated groundwater. To address the groundwater plume beneath the Boren Avenue North and Thomas Street ROWs, angled injection wells will be installed along the western and southern Property boundaries and beneath the ROW; the base of the injection wells will be located at the western and southern boundaries, respectively, of the ROWs. The approximate volume of EOS required to support a zone of dechlorination sufficient to degrade the chlorinated solvents within the groundwater beneath the Site is approximately 95,000 pounds. Actual injection rates will vary from well to well, but current plans anticipate 5 weeks of continuous injections.

The zone where natural attenuation may supplement active groundwater treatment is upgradient and crossgradient of the treatment area (south and west of the proposed conditional points of compliance), and any generated degradation products would be consumed within the anaerobic dechlorination zone.

3.1.7 Compliance Monitoring Well Installation

The following sections identify the proposed monitoring well and summarize the procedures for well installation, sampling, and documenting field activities.

3.1.7.1 Proposed Locations and Depths

Five compliance monitoring wells will be installed following excavation activities, as described below. Total depths and screen intervals will be determined based on depth to water observed during drilling.

- Three monitoring wells will be completed on the Property surrounding the source area. The wells will be installed to a depth of approximately 30 feet below ground surface (bgs) and screened from approximately 10 feet to 30 feet bgs, depending on depth to water observed during drilling.
- After acquiring traffic control plans and Seattle Department of Transportation street use permits, one well will be installed within Terry Avenue North, west of the west-adjoining property, and will be completed in a landscaped portion of the ROW to an approximate depth of 60 feet bgs. The well will be screened from approximately 45 to 60 feet bgs, or approximately 5 feet above and 10 feet below the top of the water table observed during drilling.
- After acquiring traffic control plans and Seattle Department of Transportation street use permits, one well will be installed within the Thomas Avenue ROW to an approximate depth of 100 feet bgs. The well will be screened from approximately 85 to 100 feet bgs, or approximately 5 feet above and 10 feet below the water table observed during drilling.

3.1.7.2 Well Installation Procedures

Five monitoring wells will be installed as compliance monitoring points. Each monitoring well will be constructed of 2-inch-diameter blank PVC casing, flush-threaded to 0.010-inch slotted well screen. The bottom of each of the wells will be fitted with a threaded PVC bottom cap, and the top of each well will be fitted with a locking compression-fit well cap. The annulus of the monitoring wells will be filled with #10/20 silica sand to a minimum height of 1 foot above the top of the screened interval. A bentonite seal with a minimum thickness of 1 foot will be installed above the sand pack. The wells will be completed at the surface with a flush-mounted, traffic-rated well box set in concrete. The well completion will be recorded in boring logs, examples of which are provided in Attachment A of this SAP.

3.1.7.3 Survey and Development Procedures

Upon completion of drilling and monitoring well installation activities, a survey of Property features and monitoring well locations will be performed and the wells will be developed. The horizontal and vertical monitoring well locations and top of casing and monument elevations will be surveyed by Triad Associates for the purposes of calculating groundwater flow gradient and direction. Elevations will be surveyed relative to the North American Vertical Datum of 1988 (NAVD88) using City of Seattle Benchmark No. 36690702 as the source benchmark.

The monitoring wells will be developed by SoundEarth field staff with the use of a Grundfos submersible pump and will consist of surging and purging until a minimum of five well volumes are removed and the groundwater no longer appears turbid. Turbidity will be measured visually by field staff conducting development activities.

3.1.8 Soil Vapor Extraction Well Installation

Approximately 11 horizontal extraction wells would be installed and advanced a distance of approximately 45 to 50 feet beneath the Thomas Street ROW (Figures 28 and 29 of the IAP). The wells would be installed on 15-foot centers and, based on the geologic conditions encountered within the contaminated sand lense, assume an approximate radius of influence of 20 feet. All wells would be completed by a licensed well driller and comply with the requirements of WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.

Each extraction well would be constructed of 2-inch-diameter blank stainless steel casing, flush-threaded to 0.020-inch slotted well screen. The bottom of each of the wells would be fitted with a threaded stainless steel bottom cap, and the top of each well would be fitted with a PVC couple to transition from steel to PVC then connected to a 2-inch-diameter PVC conveyance pipe. Each extraction well would have a dedicated conveyance pipe that connects the extraction well head to the system piping manifold at the system enclosure (Figures 30 and 31 of the IAP). The manifold would allow for the individual control of vacuum and air flow to each SVE well.

Each extraction well would be completed with a bentonite seal extending down from the top of casing to 2 to 3 feet above the well screen. The annulus of the injection wells would be filled with #10/20 silica sand extending from the bottom of the bentonite seal to a total length of 45 to 50 feet. The well completion would be recorded in boring logs, examples of which are provided in Attachment A of the SAP.

Upon completion of drilling and extraction well installation activities, a survey of extraction well locations would be performed and top of casing elevations will be surveyed by Triad Associates for the purposes of providing an as-built for the SVE system well configuration. Elevations would be surveyed relative to the North American Vertical Datum of 1988 (NAVD88) using City of Seattle Benchmark No. 36690702 as the source benchmark. The extraction well locations and elevations would be surveyed prior to covering the extraction well points and conveyance piping beneath the mat slab foundation the wells.

The installation of the extraction wells and system piping would be completed concurrently with construction activities and prior to the installation of the mat slab foundation. The estimated remedial time frame for the SVE system is 3 years following the soil excavation activities.

3.1.9 Injection Well Installation

The injection well design and specifications are presented on Figure 32 of the IAP. There will be approximately 58 injection wells: 46 vertical injection wells will be advanced to a depth of 35 feet below the saturated zone and 12 angled injection wells will be advanced beneath the ROW to a total vertical depth of 35 feet bgs. The angle and placement of the angled injection wells will vary by location to maximize the distribution of EOS beneath the Boren Avenue North and Thomas Street ROWs (Figures 33 through 35 of the IAP). The wells will be installed in an alternating fashion with the building footings, which will allow the contractor to work from the Remedial Excavation Area outward as the groundwater treatment system is installed. All wells will be completed by a licensed well driller and comply with the requirements of WAC 173-160, Minimum Standards for Construction and Maintenance of Wells.

Each injection well will be constructed of 2-inch-diameter blank PVC casing, flush-threaded to 0.020-inch slotted well screen. The bottom of each of the wells will be fitted with a threaded PVC bottom cap, and the top of each well will be fitted with a PVC reducer bushing and connected to a 1-inch-diameter PVC conveyance pipe. Each injection well will have a dedicated conveyance pipe that connects the injection well head to the system piping manifold at the system enclosure (Figures 32, 36, and 37 of the IAP).

Each injection well will be completed with a bentonite seal extending down from the top of casing, which will be the approximate elevation at the base of the excavation. The annulus of the injection wells will be filled with #10/20 silica sand extending from the bottom of the bentonite seal to total depth. The well completion will be recorded in boring logs (Attachment A).

Upon completion of drilling and injection well installation activities, a survey of injection well locations will be performed and the wells will be developed. The horizontal and vertical injection well locations and top of casing elevations will be surveyed by Triad Associates for the purposes of providing an as-built for the injection system well configuration. Elevations will be surveyed relative to the North American Vertical Datum of 1988 (NAVD88) using City of Seattle Benchmark No. 36690702 as the source benchmark. The injection well locations and elevations will be surveyed prior to covering the injection well points and conveyance piping beneath the mat slab foundation the wells.

The injection wells will be developed by SoundEarth field staff with the use of a Grundfos submersible pump and will consist of surging and purging until a minimum of five well volumes are removed and the groundwater no longer appears turbid. Turbidity will be measured visually by field staff conducting development activities. The installation of the injection wells and system piping will be completed concurrently with construction activities and prior to the installation of the mat slab foundation. The estimated remedial time frame for groundwater restoration is 5 years following the initial EOS injection event.

3.1.10 Injection and Bioaugmentation

Each injection well will be equipped with a pipe that runs beneath the foundation slab from the well head to the injection manifold, which will be housed in either a system piping enclosure or sub-grade vault. A temporary injection system will be used to introduce EOS and DHC into each of the injection wells. The temporary injection system will connect directly to the manifold piping to avoid the need for permanent injection equipment to be maintained within the parking garage. The injection manifold will be readily accessible for both the initial and future injection events if necessary.

The EOS will be applied at a pressure ranging from 5 to 15 pounds per square inch. Approximately 1,600 pounds of EOS will be applied to each injection well over a 5-week time frame.

Bioaugmentation will be implemented if compliance groundwater monitoring indicates that the native population of DHC needs to be supplemented. One of the proprietary DHC groups, KB1 or SB9, will be injected.

Prior to injecting, the injection wells will be registered with Ecology’s Underground Injection Control Program.

3.1.11 Well and System Decommissioning

Upon completion of the required conformational monitoring and Ecology’s issuance of an Interim Remedial Action completion letter, the compliance monitoring wells and the injection wells will be decommissioned in accordance with the Ecology Water Well Construction Act (1971), Chapter 18.104 RCW (WAC 173-160-460). The wells will be decommissioned in place using bentonite clay. The SVE system will be decommissioned and all the associated equipment and aboveground piping will be removed from the Property.

3.1.12 Vapor Sampling

Vapor samples will be collected monthly from the SVE system. The vapor sampling locations and frequency and procedures for vapor sample collection and handling are presented below.

3.1.12.1 Sample Collection and Handling Procedures

The monthly vapor samples are collected following the procedures below:

- The sample port valve will be closed. New silicon and polyethylene tubing will be connected to each of two sample port valves. One sample port is located prior to the catalytic oxidizer and the other is located on the discharge stack.
- The Tedlar bags will be inspected for leaks.
- If no leaks are found, a separate Tedlar bag will be connected to the silicon tubing on each sample port valve and the valves will be opened on each Tedlar bag.
- At each sampling location, the Tedlar bag will be filled by slowly opening the valve on the sample port until the bag is 50 percent full, and then closing the sample port valve.
- The Tedlar bag will be disconnected from the tubing and the sample will be evacuated from the bag by squeezing the bag and discharging the contents of the bag into the atmosphere through the valve on the bag.
- The Tedlar bag will be reconnected to the tubing and the sample collection and evacuation process will be repeated twice more. After the third sample collection and evacuation cycle, the air sample will be collected in the Tedlar bag. When the bag is full, the valve will be closed on the Tedlar bag and the bag/valve will be disconnected from the tubing. The sample port valve will be closed. The tubing will be removed from each sample port valve and discarded.

Field personnel will be required to document sampling activities on a field report form and will include air flow rate measurement, temperature, static and differential pressure, the sample identifier (ID), date and time of sample collection, and analyses will be recorded on the form. An example of the Field Report Form is included in Attachment A.

3.1.13 Groundwater Sampling

Groundwater samples will be collected from each of the compliance monitoring wells for laboratory analysis. The groundwater sampling locations and frequency and procedures for groundwater sample collection and handling are presented below.

3.1.13.1 Sample Collection and Handling Procedures

Groundwater samples will be collected quarterly and handled in accordance with the 1996 U.S. Environmental Protection Agency (EPA) guidance document, *Low-Flow (Minimal Drawdown)*

Ground-Water Sampling Procedures at least 24 hours following well development. SoundEarth field staff with follow the procedures described below when collecting groundwater samples:

- The locking well cap from the monitoring well will be removed and the groundwater level in the well will be allowed to equilibrate to atmospheric pressure for a minimum of 20 minutes.
- The depth to groundwater in the monitoring well will be measured relative to the top of well casing to the nearest 0.01 foot using an electronic water-level meter. The depth to the monitoring well bottom will also be measured to evaluate siltation of the monitoring well and to calculate the estimated purge water volume. All nondisposable equipment will be decontaminated between uses.
- Each monitoring well will be purged at a low-flow rate (100 to 300 milliliters per minute) using a bladder pump and dedicated polyethylene tubing. The pump intake will be placed at the approximate center of the screened interval. Temperature, pH, specific conductivity, dissolved oxygen, and oxidation-reduction potential will be monitored during purging using a water quality meter equipped with a flow-through cell while purging to determine when stabilization of these parameters occurs.
- Groundwater samples will be collected directly from the pump outlet following stabilization of temperature, pH, specific conductance, turbidity, dissolved oxygen, and oxygen-reduction potential. If the monitoring well is completely dewatered during purging, samples will be collected when the groundwater in the well has recovered to at least 80 percent of the pre-purge casing volume.
- If low-flow sampling methods are not practical, the monitoring well will be allowed to recharge for no longer than 2 hours following cessation of purging and will be sampled using a dedicated, disposable, polyethylene double-check valve bailer and sampling cord.
- The sample containers, as described in Table A-3, will be filled directly if collected from a pump, or the water samples will be transferred immediately from the bailer into laboratory-supplied sample containers, taking care to minimize turbulence. Care will be taken not to handle the seal or lid of the container when decanting the sample into the containers. The containers will be filled completely to eliminate any headspace, and the seals/lid will be secured.
- Each sample container will be labeled and handled following the protocols described in Section 4.0, Sample Handling and Quality Control Procedures.
- The chain-of-custody protocols will be maintained during sample transport and submittal to the laboratory.
- The well cap and monument will be secured following sampling. Any damaged or defective well caps or monuments will be noted and scheduled for replacement, if necessary.

Field personnel will be required to prepare Groundwater Purge and Sample Forms during groundwater monitoring and sampling activities. The forms will include depth to groundwater and total depth measurements, as well as water quality measurements, including pH, temperature, dissolved oxygen, specific conductance, oxidation-reduction potential, and/or turbidity. In addition, the sample ID, date of sample collection, and analyses will be recorded on the form. An example of the Groundwater Purge and Sample Form is included in Attachment A.

3.1.14 Soil Sampling

Performance soil samples will be collected and analyzed using an EPA-accredited laboratory to confirm that all of the dangerous waste soil (e.g., soil exhibiting concentrations of PCE above 1.9 mg/kg) has been removed. Post-excavation soil sampling will not be conducted along the bottom or sidewalls within the Remedial Excavation Area because the soil analytical data collected at the Site are sufficient to provide a bound for contaminated soil.

A contingency for performance samples will be retained in the event that an unknown condition is encountered during the course of the excavation, such as a UST. In this case, performance monitoring for soil will be conducted, the analytical results will direct the advancement of the excavation and characterize the soil for disposal.

Soil samples will be collected directly from the sidewalls and/or bottom of the dangerous waste excavation using either stainless steel or plastic sampling tools. Soil samples collected at depths of less than 4 feet bgs will be collected manually. Samples collected at depths below 4 feet bgs will be collected with the backhoe bucket unless engineering controls are in place that allow for manual sample collection at depths greater than 4 feet bgs. All non-dedicated sampling equipment will be decontaminated between uses. The samples will be submitted for laboratory analysis and the analytical results will be used to assess when the points of compliance for soil have been achieved within the dangerous waste excavation area.

4.0 SAMPLE HANDLING AND QUALITY CONTROL PROCEDURES

Sections 4.1 through 4.5 summarize sample labeling, containers, handling, chain of custody, and field quality control procedures to be applied during the cleanup action.

4.1 SAMPLE IDENTIFICATION

Each sample collected during the cleanup action will be assigned a unique sample ID and number. Sample ID labels will be filled out and affixed to appropriate containers immediately prior to sample collection. The label is filled out in indelible ink and will include the following information: media, date, time sampled, sample identification and number, project name, project number, sampler’s initials, and analyte preservative(s) if any. An example of the Sample ID Label is included in Attachment A of this SAP.

4.1.1 Vapor

Following sample collection, the Tedlar bags will be labeled with a unique sample ID number, the date and time sampled, and project number. The sample ID number will include the client facility ID number followed by INF for influent (prior to carbon) and EFF for effluent (after carbon), and the date. For example, the post-carbon vapor sample collected on June 22, 2012, would be numbered EFF-20120622. All sample collection information will be documented on a Sample Chain of Custody form. The chain-of-custody protocols will be maintained during sample transport and submittal to the laboratory. All non-reusable sampling and health and safety supplies and equipment will be disposed of in an appropriate waste dumpster at the Site.

4.1.2 Soil

Soil samples collected during the cleanup action will be identified by their position relative to a grid measuring 310 feet (east-west) by 360 feet (north-south), and segregated into 1,116 discrete grid cells (A1 through JJ31), each measuring 10 feet by 10 feet.

Bottom and sidewall samples will be assigned a unique identifier that will include the components listed below:

- The grid cell identification (e.g., A1)
- The compass heading of the sidewall (e.g., N)
- The sample type (e.g., bottom "B", sidewall "SW")
- The number of samples collected in that area (e.g., 01, 02, 03)
- The depth in feet bgs (e.g., 24)

For example, a soil sample collected from the bottom of the remedial excavation in grid cell A1 at a depth of 24 feet bgs would be identified as A1B01-24.

Likewise, a soil sample collected from the north side wall of grid cell JJ31 at a depth of 32 feet would be identified as JJ31NSW01-32. If this sidewall required overexcavation and further sampling within the same grid cell and depth, a second sample would be collected and would be identified as JJ31NSW02-32. The sample identification would be recorded on the Sample ID Label, Field Report form, Sample Summary Form, and Sample Chain of Custody Form.

4.1.3 Groundwater

Groundwater sample IDs will include a prefix of the well identification and the date. For example, the groundwater sample collected from monitoring well MW06 on October 22, 2012, would be numbered MW06-20121022. The sample identification will be placed on the Sample ID label, the Field Report form, the Groundwater Purge and Sample Form, and the Sample Chain of Custody form.

4.2 DECONTAMINATION PROCEDURES

Decontamination of all nondisposable tools and equipment will be conducted prior to each sampling event and between each sampling location, including stainless steel bowls/containers, stainless steel spoons/spatulas, stainless steel core catcher, hack saw blades, and drill bits. A sufficient supply of pre-decontaminated small equipment will be mobilized to the sampling locations to minimize the need for performing field decontamination. Field personnel will change disposable latex or nitrile gloves before collecting each sample and before decontamination procedures and will take precautions to prevent contaminating themselves with water used in the decontamination process. The following steps will be followed to decontaminate reusable soil and groundwater sampling equipment:

- The equipment will be washed with a solution of Alconox (or an equivalent detergent) and water.
- The equipment will be rinsed with tap water.
- A final rinse will be conducted with distilled or deionized water.

Residual sample media from the equipment, used decontamination solutions and associated materials, and disposable contaminated media will be disposed of according to the procedures described in Section 6.0, Management of Investigation-Derived Waste.

4.3 SAMPLE CONTAINER AND HANDLING PROCEDURES

Soil samples collected for analysis of volatile organic compounds (VOCs) will be collected in accordance with EPA Method 5035. Groundwater samples will be collected in accordance with the EPA's 1996 guidance *Low Flow (Minimal Drawdown) Groundwater Sampling Procedures*. Required containers, preservation, and holding times for each anticipated analysis are listed in Table A-3.

SoundEarth personnel will be responsible for following the container handling procedures below:

- Each sample container will be labeled and handled with the date and time sampled, well identification number, project number, and preservative(s), if any.
- All sample collection information will be documented on a Sample Chain of Custody form; the sample will be placed in a cooler chilled to near 4 degrees Celsius and transported to the laboratory.

The field coordinator will check all container labels, chain of custody for entries, and field notes for completeness and accuracy at the end of each day.

4.4 SAMPLE CHAIN-OF-CUSTODY PROCEDURES

The written procedures that will be followed whenever samples are collected, transferred, stored, analyzed, or destroyed are designed to create an accurate written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis and reporting of analytical values. This written record, the Sample Chain of Custody form, will be filled out by the field sampling team at the time the sample is obtained. An example of the Sample Chain of Custody form is included in Attachment A.

All samples submitted to the laboratory are accompanied by the Sample Chain of Custody Form. This form is checked for accuracy and completeness and then signed and dated by the laboratory sample custodian accepting the sample. At the laboratory, each sample is assigned a unique, sequential laboratory identification number that is stamped or written on the Sample Chain of Custody Form.

All samples are held under internal chain of custody in the sample control room using the appropriate storage technique (i.e., ambient, refrigeration, frozen). The Laboratory Project Manager assigned to a particular client will be responsible for tracking the status of the samples throughout the laboratory. Samples will be signed out of the sample control room in a sample control logbook by the analyst who will prepare the samples for analysis.

The Sample Chain of Custody form will include the following information: client, project name and number, date and time sampled, sample identification, sampler's initials, analysis, and analyte preservative(s), if any.

4.5 FIELD QUALITY ASSURANCE SAMPLING

Field and laboratory activities will be conducted in such a manner that the results be valid and meet the data quality objectives for this project. QA/QC groundwater samples will be collected during the course of the groundwater monitoring to provide for data validation as detailed in Section 7.0. QA/QC samples will consist of field duplicates. QA/QC samples will be collected and sent to the laboratory along with the primary field samples. Based on the sampling frequency and number of groundwater samples anticipated, it is estimated that one groundwater field duplicate sample will be submitted per sampling event. The QA/QC samples will be assigned a unique sample identifier and number. The number will include a prefix of MW99 for field duplicates. For example, a field duplicate collected on October 22, 2013, would be labeled MW99-20131022. SoundEarth will note the locations of the field duplicates in the field notes.

5.0 ANALYTICAL TESTING

All compliance samples will be submitted to Friedman and Bruya, Inc., an Ecology-accredited analytical laboratory, on a standard 7- to 10-day turnaround time. All chemical and physical testing will adhere to EPA's SW-846 QA/QC procedures and analysis protocols or follow the appropriate Ecology methods. In completing chemical analyses for this project, the laboratory will meet the following minimum requirements:

- Adhere to the methods outlined in this SAP, including methods referenced for each analytical procedure.
- Provide a detailed discussion of any modifications made to previously approved analytical methods.
- Deliver PDF and electronic data as specified.
- Meet reporting requirements for deliverables.
- Meet turnaround times for deliverables.
- Implement QA/QC procedures discussed in Section 7.0, including data quality objectives (DQOs), laboratory quality control requirements, and performance evaluation testing requirements.
- Notify the project QA/QC Manager of any QA/QC problems when they are identified to allow for quick resolution.
- Allow laboratory and data audits to be performed, if deemed necessary.

Copies of the *Laboratory Quality Assurance Manual* from Friedman and Bruya, Inc. are on file at SoundEarth's offices for review and reference and will be followed throughout the cleanup action. Access to laboratory personnel, equipment, and records pertaining to samples, collection, transportation, and analysis can be provided. Container requirements, holding times, and preservation methods for soil and water are summarized in Table A-3.

Sample laboratory analytical results for each analyte will be compared to regulatory limits applicable to the cleanup action. A detailed description of the analytical methods, laboratory practical quantitation limits (PQLs), and applicable regulatory limits for each analyte is provided in Table A-4 and is summarized in the Sections 5.1 through 5.3 below for each medium to be sampled during the cleanup action.

5.1 VAPOR

Vapor samples collected will be submitted for laboratory analysis of chlorinated VOCs (CVOCs) by EPA Method 8260C, GRPH by Method NWTPH-Gx, and BTEX by EPA Method 8021B.

5.2 SOIL

Select soil samples will be submitted for laboratory analysis of CVOCs by EPA Method 8260C. In addition, samples collected from previously unsampled areas that exhibit indications of contamination, as discussed in greater detail in the IAP, will be analyzed for CVOCs by EPA Method 8260C; GRPH by Northwest Total Petroleum Hydrocarbon (NWTPH) Method NWTPH-Gx; DRPH and ORPH by Method NWTPH-Dx; and/or benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021B or 8260C.

5.3 GROUNDWATER

Groundwater samples will be submitted for laboratory analysis of CVOCs by EPA Method 8260C (unpreserved sample containers will be used for vinyl chloride analyses), GRPH by Method NWTPH-Gx, DRPH and ORPH by Method NWTPH-Dx, and BTEX by EPA Method 8021B.

6.0 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

Contaminated soil, groundwater, and disposable equipment generated during the cleanup action will be handled in accordance with a contained-in determination and/or in accordance with state and federal regulations. The procedures for managing investigation-derived waste for the expected waste streams are discussed in Sections 6.1 through 6.3 below.

6.1 SOIL

Prior to initiating the field activities, a contained-in determination for soils contaminated with F002-listed dangerous waste constituents will be requested from Ecology. Wastes generated during the remedial activities require analytical testing before disposal. Generally, the treatment, storage, and disposal facility (TSDF) receiving the waste specifies the minimum number of samples and analyses before accepting wastes from a site; at the Site, data generated during the remedial investigation activities is sufficient to develop a waste profile. Wastes that will be generated from the remedial action and destined for off-Site disposal include:

- Soil contaminated with PCE and its degradation products, GRPH (as Stoddard solvents), DRPH, ORPH, and associated compounds
- Contaminated groundwater from excavation dewatering
- Contaminated personal protective equipment
- Decontamination solutions
- Miscellaneous solid wastes

Each waste stream will be profiled separately in accordance with the minimum waste analyses requirements of the respective permitted TSDF. Excavated contaminated soil will be handled according the soil management grid and corresponding soil disposal and classification table (Appendix C of the IAP). If unforeseen soil conditions are encountered, additional waste profiling may be required to ensure proper classification and disposal. The soil will be disposed of in accordance with the contained-in determination, and Material Import and Export Summary forms (Attachment A of this SAP) documentations demonstrating compliance with the determination will be submitted to Ecology upon receipts of the disposal tickets.

Soil waste generated during drilling will be stored in labeled 55-gallon drums or loaded onto trucks for disposal. Composite soil samples will be collected from the drums for waste characterization purposes. The drums will be labeled with the source (soil boring ID and depths) and disposed of in accordance with the requirements based on the analytical results of sampling.

6.2 WATER

A dewatering system will be established to remove and store the contaminated perched water-bearing zone located in the center of the Property. The water will be stored in a baker tank pending sample analytical results. Based on the data, the water will be disposed of in accordance with the construction permits or treated prior to disposal. Any additional water generated during dewatering the larger excavation or captured as sheetflow will be collected and stored in a baker tank pending analysis and characterization prior to disposal.

All purge water will be temporarily stored in appropriately labeled containers at the Property pending receipt of waste profiling results. An estimated volume of 20 to 30 gallons of purge and decontamination water is anticipated to be generated during the development of each well and during each performance sampling event.

6.3 DISPOSABLES

Disposable personal protective clothing (e.g., Tyvek suits, rubber gloves, and boot covers) and disposable sampling devices (e.g., plastic tubing, plastic scoops, and bailers) will be placed in plastic garbage bags and disposed of as nonhazardous waste.

7.0 DATA QUALITY OBJECTIVES

Field and laboratory activities will be conducted in such a manner that the results be valid and meet the data quality objectives for this project. Guidance for QA/QC will be derived from the protocols developed for the cited methods within EPA's documents *Test Methods for the Evaluation of Solid Wastes Laboratory Manual Physical/Chemical Methods SW-846* and the National Contract Laboratory Review Program, National Functional Guidelines for Organic Data Review. The data quality objectives are designed to:

- Assist the project manager and project team to focus on the factors affecting data quality during the planning stage of the project.
- Facilitate communication among field, laboratory, and project staff as the project progresses.
- Document the planning, implementation, and assessment procedures for QA/QC activities for the cleanup action.
- Verify that the DQOs are achieved.
- Provide a record of the project to facilitate final report preparation.

The DQOs for the project include both qualitative and quantitative objectives, which define the appropriate type of data and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the cleanup action. To verify that the DQOs are achieved, this SAP details aspects of sample collection and analysis including analytical methods, QA/QC procedures, and data quality reviews. This SAP describes both qualitative and quantitative measures of data quality to verify that the DQOs are achieved.

Detailed QA/QC procedures in the field and at the laboratory are provided in the following sections. The DQOs for the cleanup action will be used to develop and implement procedures to verify that data collected is of sufficient quality to adequately address the objectives of the cleanup action as defined in the IAP. All observations and measurements will be made and recorded in such a manner as to yield results representative of the media and conditions observed and/or measured. Goals for representativeness will be met by verifying that sampling locations are selected properly, that a sufficient number of samples are collected, and that field screening and laboratory analyses are conducted properly.

The quality of the laboratory data will be assessed by precision, accuracy, representativeness, completeness, comparability, and sensitivity. Definitions of these parameters and the applicable QC procedures are described in Sections 7.1 through 7.6. Quantitative DQOs are provided following each definition. Laboratory DQOs have been established by the analytical laboratory. Applicable quantitative goals for these DQOs are listed in Table A-5.

7.1 PRECISION

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of two or more measurements compared to their average values. Precision is calculated from results of duplicate sample analyses. Precision is quantitatively expressed as the relative percent difference (RPD) and is calculated as follows:

$$RPD = \frac{(C_1 - C_2)}{(C_1 + C_2)/2} x\,100$$

Where:

C_1 = larger of the two duplicate results (i.e., the highest detected concentration)

C_2 = smaller of the two duplicate results (i.e., the lowest detected concentration)

RPD = relative percent difference

There are no specific RPD criteria for organic chemical analyses. Quantitative RPD criteria for organic analyses will be based on laboratory-derived control limits.

7.2 ACCURACY

Accuracy is a measure of the closeness (bias) of the measured value to the true value. The accuracy of chemical analytical results is assessed by “spiking” samples in the laboratory with known standards (a surrogate or matrix spike of known concentration) and determining the percent recovery. The accuracy is measured as the percent recovery (%R) and is calculated as follows:

$$\%R = \frac{(M_{sa} - M_{ua})}{C_{sa}} x\,100$$

Where:

%R = percent recovery

C_{sa} = actual concentration of spike added

M_{sa} = measured concentration in spiked aliquot

M_{ua} = measured concentration in unspiked aliquot

Laboratory matrix spikes and surrogates will be carried out at the analytical laboratory in accordance with EPA SW-846 and Ecology methods and procedures for inorganic and organic chemical analyses. The frequency of matrix spikes and matrix spike duplicates will each be one per batch of 20 samples or less for soil samples. Quantitative percent recovery criteria for organic analyses will be based on laboratory-derived control limits for surrogate recovery and matrix spike results.

The accuracy of sample results can also be affected by the introduction of contaminants to the sample during collection, handling, or analysis. Contamination of the sample can occur because of improperly cleaned sampling equipment, exposing samples to chemical concentrations in the field or during transport to the laboratory, or because of chemical concentrations in the laboratory. To demonstrate that the samples collected are not contaminated, laboratory method blank samples will be analyzed. The laboratory will run method blanks at a minimum frequency of 5 percent or one per batch to assess potential contamination of the sample within the laboratory.

7.3 REPRESENTATIVENESS

Representativeness is a qualitative assessment of how closely the measured results reflect the actual concentration or distribution of the constituent concentrations in the matrix sampled. The sampling plan design, sample collection techniques, sample handling protocols, sample analysis methods, and data review procedures have been developed to verify that the results obtained are representative of the site conditions. These issues are addressed in detail in Section 5.0, Analytical Testing and Section 9.0, Quality Control Procedures.

7.4 COMPLETENESS

Completeness is defined as the percentage of measurements judged to be valid. Results will be considered valid if they are not rejected during data validation (Section 9.0, Quality Control Procedures). Completeness is calculated as follows:

$$C = \frac{(Number\ of\ Valid\ Measurements)}{(Total\ Number\ of\ Measurements)}\ x\ 100$$

Objectives for completeness are based, in part, on the subsequent uses of the data (i.e., the more critical the use, the greater the completeness objective). The objectives for completeness of samples are expressed as percentages, which refer to the minimum acceptable percentages of samples received at the laboratory in good condition and acceptable for analysis. The objectives of completeness for other samples are 95 percent for soil and water samples. These objectives will be met through the use of proper sample containers, proper sample packaging procedures to prevent breakage during shipment, proper sample preservation, and proper labeling and chain-of-custody procedures. A loss of 5 to 10 percent of intended samples is common, and the goals set are sufficient for intended data uses.

The objectives for completeness of chemical analyses are also expressed as percentages and refer to the percentages of analytical requests for which usable analytical data are produced. The initial objective for completeness of chemical analyses in the laboratory is 95 percent.

7.5 COMPARABILITY

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. The use of standard Ecology and EPA methods and procedures for both sample collection and laboratory analysis will make the data collected comparable to both internal and other data generated.

7.6 SENSITIVITY

Analytical sensitivities are measured by PQLs, which are defined as the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions. PQLs are determined by the laboratory. The specific analytes and their corresponding PQLs that will be required for the cleanup action are presented in Table A-4. The detection or reporting limits for actual samples may be higher depending on the sample matrix and laboratory dilution factors.

8.0 DATA COLLECTION

This section outlines the procedures to be followed for the inventory, control, storage, and retrieval of data collected during performance of the cleanup action. The procedures contained in this SAP are designed to verify that the integrity of the collected data is maintained for subsequent use. Moreover, project-tracking data (e.g., schedules and progress reports) will be maintained to monitor, manage, and document the progress of the cleanup action.

8.1 DATA COLLECTION APPROACH

Procedures that will be used to collect, preserve, transport, and store samples are described in Section 4.0, Sample Handling and Quality Control Procedures. All sampling protocols will be performed in accordance with generally accepted environmental practices and will meet or exceed current regulatory standards and guidelines. Sampling procedures may be modified, if necessary, to satisfy amendments to current regulations, methods, or guidelines. The data collection approach for key elements of the cleanup action field program will verify the project DQOs are met or exceeded. The key elements include soil samples collected and analytical results used to demonstrate that the concentrations of COCs at the limits of the remedial excavation are below applicable cleanup levels as defined in the SAP. The total number of samples collected and specific analyses to be performed will be based on field screening results, field observations, and analytical results for performance and confirmational monitoring.

8.2 DATA TYPES

A variety of data will be generated during the cleanup action, including sampling and analytical data. The laboratory analytical data will be transmitted to SoundEarth as an electronic file, in addition to a hardcopy laboratory data report. This method will facilitate the subsequent validation and analysis of these data while avoiding transcription errors that may occur with computer data entry. Examples of data types include manually recorded field data, such as boring logs, and electronically reported laboratory data.

8.3 DATA TRANSFER

Procedures controlling the receipt and distribution of incoming data packages to SoundEarth and outgoing data reports from SoundEarth include the following:

- Incoming documents will be date-stamped and filed. Correspondence and transmittal letters for all reports, maps, and data will be filed chronologically. Data packages, such as those from field personnel, laboratories (such as soil data) and surveyors (elevation data), will be filed by project task, subject heading, and date. If distribution is required, the appropriate number of copies will be made and distributed to the appropriate persons or agencies.
- A transmittal sheet will be attached to all project data and reports sent out. A copy of each transmittal sheet will be kept in the administrative file and the project file. The Project Manager and Project QA/QC Officer will review all outgoing reports and maps.

8.4 DATA INVENTORY

Procedures for filing, storage, and retrieval of project data and reports are discussed below.

8.4.1 Document Filing and Storage

As previously discussed, project files and raw data files will be maintained at SoundEarth's office. Files will be organized by project tasks or subject heading and maintained by the document control clerk. Hard copy project files will be archived for a minimum of 3 years after completion of the project. Electronic copies of files will be maintained in a project directory and backed up daily, weekly, and monthly.

8.4.2 Access to Project Files

Access to project files will be controlled and limited to Touchstone and its authorized representatives, Ecology, and SoundEarth personnel. When a hard copy file is removed for use, a sign-out procedure will be used to track custody. If a document is to be used for a long period, a copy will be used, and the original will be returned to the project file. Electronic access to final reports, figures, and tables will be write-protected in the project directory.

8.5 DATA VALIDATION

Data quality review will be performed where applicable in accordance with the current EPA guidance as set forth in *Guidance on Environmental Data Verification and Data Validation* (EPA QA/G-8). The following types of QC information will be reviewed, as appropriate:

- Method deviations
- Sample extraction and holding times
- Method reporting limits
- Blank samples (equipment rinsate and laboratory method)
- Duplicate samples
- Matrix spike/matrix spike duplicate samples (accuracy)
- Surrogate recoveries
- Percent completeness and RPD (precision)

- A quality assurance review of the final analytical data packages for samples collected during the cleanup action.

8.6 DATA REDUCTION AND ANALYSIS

The Project Manager and Project QA/QC Officer are responsible for data review and validation. Data validation parameters are outlined as quantitative DQOs in Section 7.0, Data Quality Objectives. The particular type of analyses and presentation method selected for any given data set will depend on the type, quantity, quality, and prospective use of the data in question. The analysis of the project data will require data reduction for the preparation of tables, charts, and maps. To verify that data are accurately transferred during the reduction process, two data reviews will be performed, one by the Project QA/QC Officer or Project Manager and another by the Project Principal, prior to issuing the documents. Any incorrect transfers of data will be highlighted and changed.

9.0 QUALITY CONTROL PROCEDURES

This section provides a description of the QC procedures for both field activities and laboratory analysis. The field QC procedures include standard operating procedures for sample collection and handling, equipment calibration, and field QC samples.

9.1 FIELD QUALITY CONTROL

Field QC samples (e.g., duplicate samples) will be collected during this project and will follow the standard operating procedures during field screening activities. The procedural basis for these field data collection activities will be documented on the field report forms, as described in Section 11.1, Field Documentation. Any deviations from the established protocols will be documented on the field report forms.

QA/QC groundwater samples will be collected during the cleanup action to provide for data validation, as described in Section 7.0 Data Quality Objectives. QA/QC samples will consist of field duplicates. QA/QC samples will be collected and shipped to the laboratory along with the primary field samples. Based on the sampling frequency and number of groundwater samples anticipated, it is estimated that one field duplicate sample will be submitted per sampling event. The QA/QC samples will be assigned a unique sample identifier and number. The number will include a prefix of MW99 or MW98 (if two field duplicates are collected) for field duplicates. For example, a field duplicate collected on October 22, 2011, would be labeled MW99-20111022. SoundEarth will note the locations of the field duplicates in the field notes.

9.2 LABORATORY QUALITY CONTROL

Analytical laboratory QA/QC procedures are provided in the *Laboratory Quality Assurance Manual* that is on file at SoundEarth's office for Friedman & Bruya, Inc. and are summarized below:

- **Laboratory Quality Control Criteria.** Results of the QC samples from each sample group will be reviewed by the analyst immediately after a sample group has been analyzed. The QC sample results will then be evaluated to determine whether control limits were exceeded. If control limits are exceeded in the sample group, corrective action (e.g., method modifications followed by reprocessing the affected samples) will be initiated prior to processing a subsequent group of samples. All primary chemical standards and standard solutions used in this project will be traceable to documented and reliable commercial sources. Standards will be validated to determine their accuracy by comparison with an independent standard. Any impurities identified in the standard will be documented.

The following paragraphs summarize the procedures that will be used to assess data quality throughout sample analysis:

- **Laboratory Duplicates.** Analytical duplicates provide information on the precision of the analysis and are useful in assessing potential sample heterogeneity and matrix effects. Analytical duplicates are subsamples of the original sample that are prepared and analyzed as a separate sample. A minimum of 1 duplicate will be analyzed per sample group or for every 20 samples, whichever is more frequent.
- **Matrix Spikes and Matrix Spike Duplicates.** Analysis of matrix spike (MS) samples provides information on the extraction efficiency of the method on the sample matrix. By performing matrix spike duplicate (MSD) analyses, information on the precision of the method is also provided for organic analyses. A minimum of 1 MS/MSD will be analyzed for every sample group or for every 20 samples, whichever is more frequent.
- **Laboratory Control Samples.** A laboratory control sample is a method blank sample carried throughout the same process as the samples to be analyzed, with a known amount of standard added. The blank spike compound recovery assesses analytical accuracy in the absence of any sample heterogeneity or matrix effects.
- **Surrogate Spikes.** All project samples analyzed for organic compounds will be spiked with appropriate surrogate compounds as defined in the analytical methods. Surrogate recoveries will be reported by the laboratories; however, no sample result will be corrected for recovery using these values.
- **Method Blanks.** Method blanks are analyzed to assess possible laboratory contamination at all stages of sample preparation and analysis. A minimum of 1 method blank will be analyzed for every extraction batch or for every 20 samples, whichever is more frequent.

9.3 DATA QUALITY CONTROL

All data generated by Friedman & Bruya, Inc. will undergo two levels of QA/QC evaluation: one by the laboratory and one by SoundEarth. As specified in Friedman & Bruya, Inc.'s *Laboratory Quality Assurance Manual*, the laboratory will perform initial data reduction, evaluation, and reporting. The analytical data will then be validated at SoundEarth under the supervision of the Project QA/QC Officer. The following types of QC information will be reviewed, as appropriate:

- Method deviations
- Sample transport conditions (temperature and integrity)
- Sample extraction and holding times
- Method reporting limits
- Blank samples
- Duplicate samples
- Surrogate recoveries

- Percent completeness
- RPD (precision)

SoundEarth will review field records and results of field observations and measurements to verify procedures were properly performed and documented. The review of field procedures will include:

- Completeness and legibility of field logs
- Preparation and frequency of field QC samples
- Equipment calibration and maintenance
- Sample Chain-of-Custody forms

Corrective actions are described in Section 10.0, Corrective Actions.

9.4 DATA ASSESSMENT PROCEDURES

The Project Manager and Project QA/QC Officer are responsible for data review and validation. Upon receipt of each data package from the laboratory, calculations using the equations presented for precision, accuracy, and completeness will be performed. Results will be compared to quantitative DQOs, where established, or qualitative DQOs. Data validation parameters are outlined in Section 3.0, Data Quality Objectives.

9.5 PERFORMANCE AUDITS

Performance audits will be completed for both sampling and analysis work. Field performance will be monitored through regular review of Sample Chain-of-Custody forms, field forms, and field measurements. The Project Manager and/or the Project QA/QC Officer may also perform periodic review of work in progress at the Site.

Accreditations received from Ecology for each analysis by Friedman & Bruya, Inc. demonstrate the laboratory's ability to properly perform the requested methods. Therefore, a system audit of the analytical laboratory during the course of this project will not be conducted.

The Project Manager and/or Project QA/QC Officer will oversee communication with the analytical laboratory on a frequent basis while samples are being processed and analyzed at the laboratory. This will allow SoundEarth to assess progress toward meeting the DQOs and to take corrective measures if problems arise.

The analytical laboratory will be responsible for identifying and correcting, as appropriate, any deviations from performance standards as discussed in Friedman & Bruya, Inc.'s *Laboratory Quality Assurance Manual.* The laboratory will communicate to the Project Manager or the Project QA/QC Officer all deviations to the performance standards and the appropriate corrective measures made during sample analysis. Corrective actions are discussed in Section 10.0.

10.0 CORRECTIVE ACTIONS

Corrective actions will be the joint responsibility of the Project Manager and the Project QA/QC Officer. Corrective procedures can include:

- Identifying the source of the violation.
- Reanalyzing samples, if holding time criteria permit.
- Resampling and analyzing.
- Re-measuring parameter.
- Evaluating and amending sampling and analytical procedures.
- Qualifying data to indicate the level of uncertainty.

During field sampling operations, the Project Manager and field staff will be responsible for identifying and correcting protocols that may compromise the quality of the data. All corrective actions taken will be documented in the field notes.

11.0 DOCUMENTATION AND RECORDS

Project files and raw data files will be maintained at SoundEarth's office. Project records will be stored and maintained in a secure manner. Each project team member is responsible for filing all necessary project information or providing it to the person responsible for the filing system. Individual team members may maintain files for individual tasks, but must provide such files to the central project files upon completion of each task. A project-specific index of file contents will be kept with the project files. Hard copy documents will be kept on file at SoundEarth or at a document storage facility throughout the duration of the project, and all electronic data will be maintained in the database at SoundEarth. All sampling data will be submitted to Ecology in both printed and electronic formats pursuant to WAC 173-340-840(5) and Ecology's Toxics Cleanup Program Policy 840 (Data Submittal Requirements).

11.1 FIELD DOCUMENTATION

Documentation of field activities will be included on Field Report forms, Boring Log Forms, Groundwater Purge and Sample Forms, Sample ID Labels, Waste Material Labels, Waste Inventory Forms, Drum Inventory forms, Material Import and Export Summary Forms, Sample Summary Forms, and Sample Chain-of-Custody forms, examples of which are provided in Attachment A. Field forms will be scanned and saved to an electronic project folder. Original and copied forms will be filed in a binder that will be maintained by the Project Manager.

Field personnel will be required to keep a daily field log on a Field Report form. Field notes will be as descriptive and as inclusive as possible, allowing independent parties to reconstruct the sampling situation from the recorded information. Language will be objective, factual, and free of inappropriate terminology. A summary of each day's events will be completed on a Field Report form. At a minimum, field documentation will include the date, job number, project identification and location, weather conditions, sample collection data, personnel present and responsibilities, field equipment used, and activities performed in a manner other than specified in the SAP. In addition, if other forms are completed or used (e.g., Sample Chain-of-Custody form), they will be referred to in and attached to the Field Report form. Field personnel will sign the Field Report form. An example of the Field Report form is included in Attachment A.

11.2 ANALYTICAL RECORDS

Analytical data records will be retained by the laboratory and stored electronically in the SoundEarth project file and project database. For all analyses, the data reporting requirements will include those items necessary to complete data validation, including copies of all raw data. The analytical laboratory will be required to report the following, as applicable: project narrative, chain-of-custody records, sample results, QA/QC summaries, calibration data summary, method blank analysis, surrogate spike recovery, matrix spike recovery, matrix duplicate, and laboratory control sample(s).

12.0 HEALTH AND SAFETY PROCEDURES

Field personnel will adhere to health and safety procedures that will be detailed under a separate cover as the project-specific Health and Safety Plan (HASP). The health and safety and emergency response protocols outlined in the HASP are designed to ensure compliance with state and federal regulations governing worker safety on hazardous waste sites. The Department of Labor has published final rules (Part 1910.120 of Title 29 of the Code of Federal Regulations, March 6, 1990) that amend the existing Occupational Safety and Health Administration standards for hazardous waste operations and emergency response. Within Washington State, these requirements are addressed in WAC 296-843, Hazardous Waste Operations. These regulations apply to the activities to be performed at this Site as a site remediation, or cleanup, under RCRA 1976 and/or MTCA.

Subcontractors to SoundEarth are required to prepare and effectively implement their own HASP based on their unique scope of work and professional expertise. Each subcontractor’s HASP must comply with all applicable federal, state, and local regulations. The subcontractor’s HASP should employ appropriate best practices to protect all personnel working on the Site, as well as the public, and to prevent negative impacts to the project or Site.

The responsibilities of SoundEarth for safety on this Site are limited to the following:

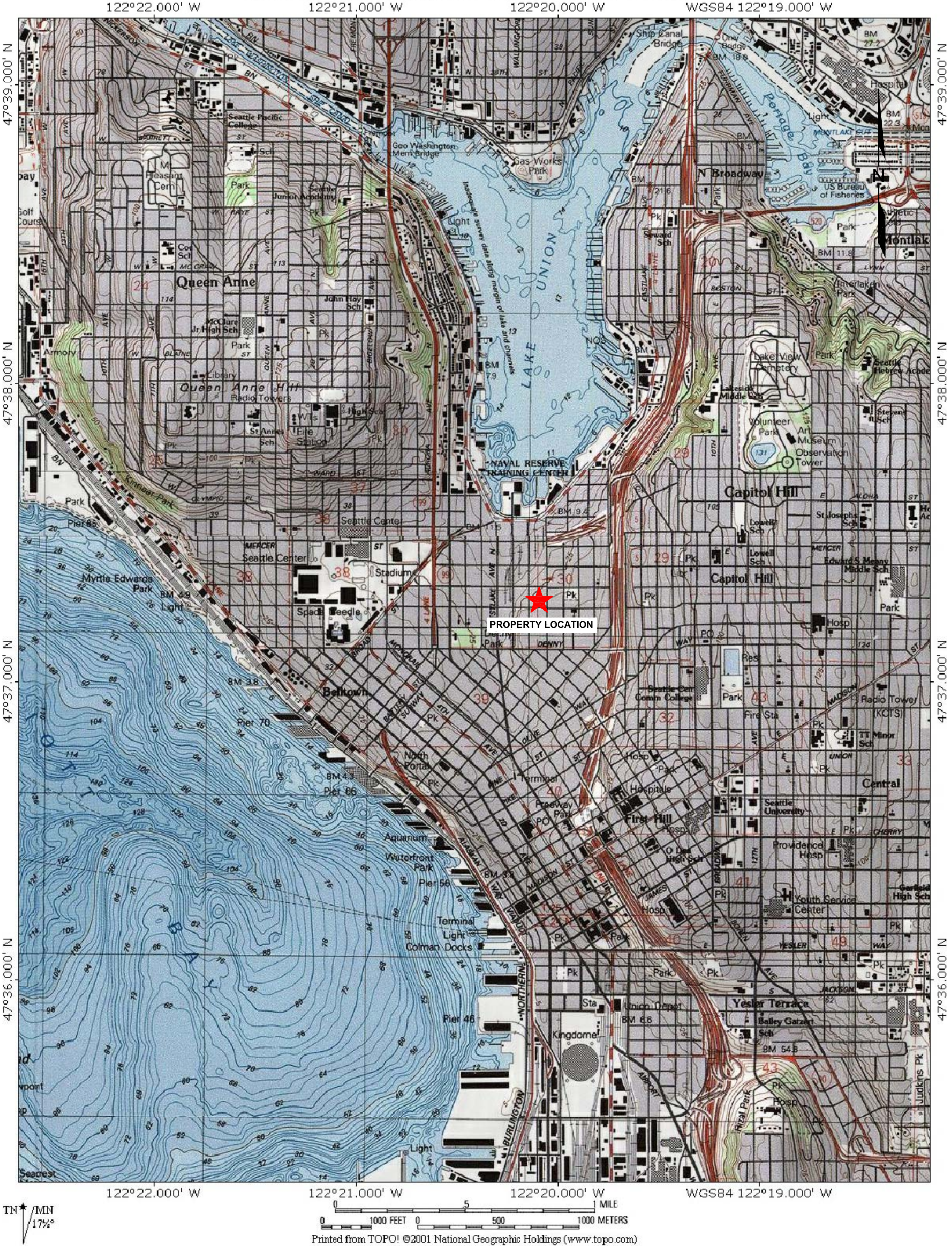
- Implementation of the provisions of this HASP for the protection of its employees and visitors on the Site to the extent that the Site and its hazards are under the control of SoundEarth.
- Protection of the Site, other personnel, and the public from damage, injury, or illness as a result of the activities of SoundEarth and its employees while on the Site.
- Provision of additional safety-related advice and/or management as contractually determined between the parties.

It is anticipated that all field work will be performed during the cleanup action in Level D personal protective equipment. Potential hazards that may be encountered during the cleanup action field activities include exposure to contaminants; traffic/mobile equipment; process hazards; unstable ground; noise exposure; overhead and underground utilities; slips, trips, and falls; powered tools and equipment; working around heavy equipment; rolling and/or pinching objects; and exposure to weather conditions.

FIGURES

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\DELIVERABLES\2012 CAP\APPENDIX A SAP\FIGURES & TBLS\0731-004-04 FIG 1 F.DWG

TOPO! map printed on 08/16/10 from "Washington.tpo" and "Untitled.tpg"



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DATE: 06/06/2011
DRAWN BY: JQC
CHECKED BY: RMT
CAD FILE: 0731-004-04_FIG1

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004-04
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

FIGURE A-1

PROPERTY
LOCATION MAP

SOUNDEARTHINC.COM

1/15/2013

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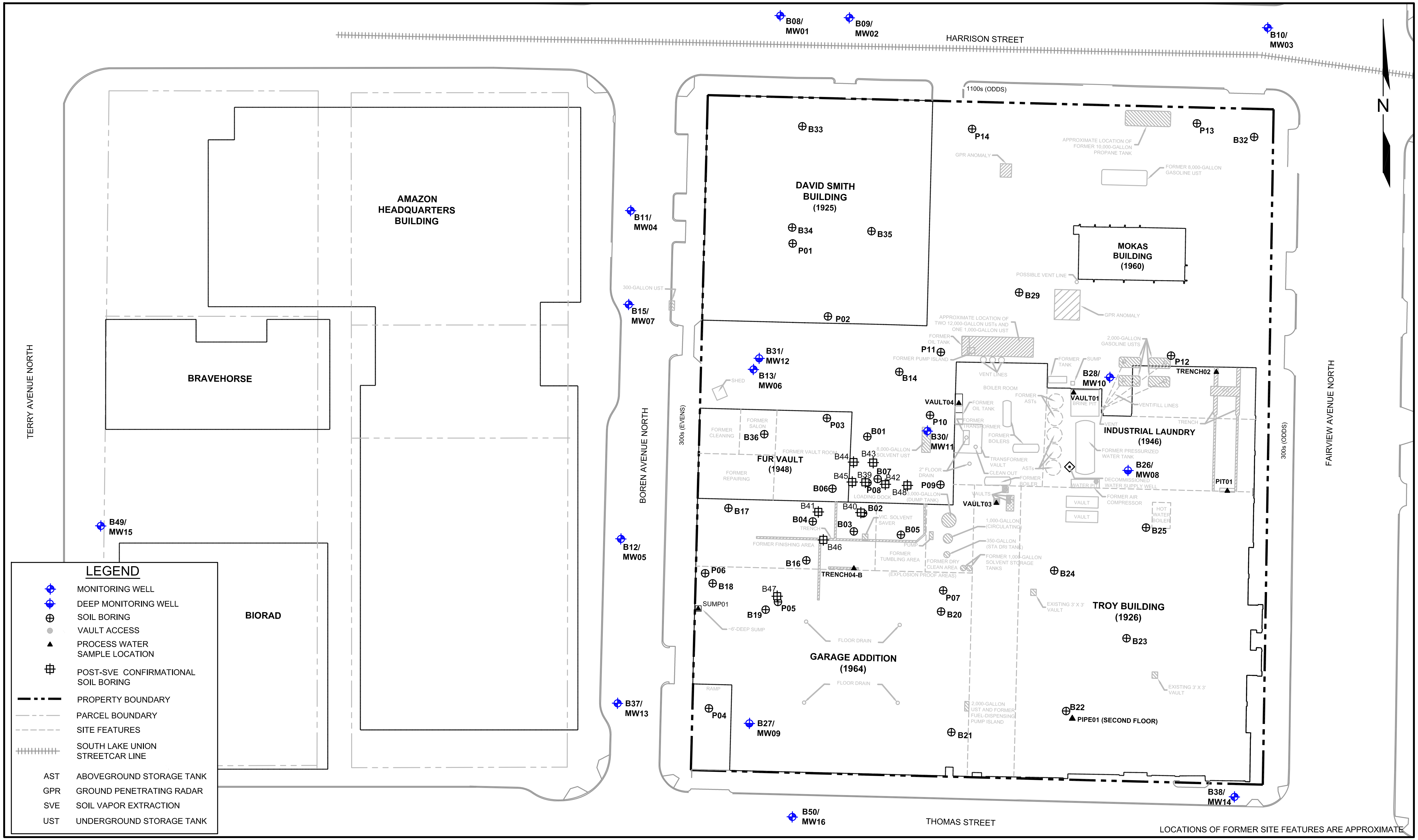

LOCATIONS OF FORMER SITE FEATURES ARE APPROXIMATE

LEGEND

⊕	MONITORING WELL
⊕	DEEP MONITORING WELL
⊕	SOIL BORING
●	VAULT ACCESS
▲	PROCESS WATER SAMPLE LOCATION
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · —	PROPERTY BOUNDARY
– – –	PARCEL BOUNDARY
– – –	SITE FEATURES
++++++	SOUTH LAKE UNION STREETCAR LINE
AST	ABOVEGROUND STORAGE TANK
GPR	GROUND PENETRATING RADAR
SVE	SOIL VAPOR EXTRACTION
UST	UNDERGROUND STORAGE TANK

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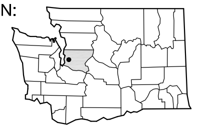
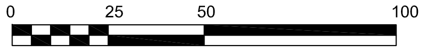
DATE: 12/13/12
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0731-004_2013ICAP_EL

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET

FIGURE A-2

PROPERTY PLAN

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TABLES

Table A-1
Preliminary Project Schedule
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Task/Scope of Work*	Schedule
Task 1: Prefield activities, including site preparation and mobilization	Second through Third Quarters 2013
Task 2: Well decommissioning	Third Quarter 2013
Task 3: Shoring installation	Third Quarter 2013
Task 4: Excavation, including any underground storage tank site assessments	Third through Fourth Quarters 2013
Task 5: On-Property compliance well installation	Second through Fourth Quarters 2013
Task 6: Soil Vapor Extraction and Injection system design and installation	Fourth Quarter 2013
Task 7: Injection	First Quarter 2014
Task 8: Soil vapor extraction system operation and maintenance	First Quarter 2014
Task 9: Compliance monitoring well sampling	Quarterly starting First Quarter 2014
Task 10: Cleanup action progress report	First Quarter 2014
Task 11: Site closure/final reporting	First through Second Quarters 2018
Task 12: Soil vapor extraction system decommissioning	Second Quarter 2018
Task 13: Monitoring and remediation well decommissioning	Second Quarter 2018

NOTES:

*Timing and conduct of the tasks will be determined by City of Seattle Entitlements process/issuance of the building permit, as well as any pre-leasing or financial requirements/limitations. Site closure and well decommissioning will determined based on the results of compliance monitoring events.

SoundEarth Strategies

Table A-2
Key Personnel and Responsibilities
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Project Title	Name	Project Role	Organization	Mailing Address	Email Address	Phone
Regulatory Agency	Russ Olsen	Regulatory project management. Reviews and approves all submittals to Washington State Department of Ecology.	Washington State Department of Ecology	3190 160th Avenue Southeast Bellevue, Washington 98008	rols461@ecy.wa.gov	(425) 649-7038
Project Contact	Shawn Parry	Property owner and project contact.	Touchstone Corporation	2025 First Avenue, Suite 1212 Seattle, Washington 98121	sparry@touchstonecorp.com	(206) 441-2955
Project Principal	Berthin Q. Hyde, LG, LHG	Reviews and oversees all project activities. Reviews all data and deliverables prior to submittal to project contact or Washington State Department of Ecology.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102	bqhyde@soundearthinc.com	(206) 306-1900
Project Manager	Erin Rothman	Overall project management, including SAP development, field oversight, document preparation and submittal, and project coordination.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102	erinr@soundearthinc.com	(206) 306-1900
Project QA/QC Officer	Audrey Hackett	Coordinates with laboratory to ensure that SAP requirements are followed and that laboratory QA objectives are met.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102	ahackett@soundearthinc.com	(206) 306-1900
Field Coordinator	Chris Cass, LG	Reports to the project manager. Ensures all project health and safety requirements are followed; coordinates and participates in the field sampling activities; coordinates sample deliveries to laboratory; coordinates sampling activities with site owner. Subcontractors; reports any deviations from project plans.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102	ccass@soundearthinc.com	(206) 306-1900
Field Staff	Various licensed geologists and environmental professionals	Reports to field coordinator. Conducts sampling activities.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102		(206) 306-1900
Data Manager	Jenny Cheng	Ensures that analytical data is incorporated into site database with appropriate qualifiers following validation.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102	jcheng@soundearthinc.com	(206) 306-1900
Data Validation	Audrey Hackett	Coordinates with laboratory to ensure that the SAP requirements and laboratory QA/QC objectives are met.	SoundEarth Strategies, Inc.	2811 Fairview Avenue South Suite 2000 Seattle, Washington 98102	ahackett@soundearthinc.com	(206) 306-1900
Laboratory Project Manager	Michael Erdahl	Provides analytical support and will be responsible for providing certified, precleaned sample containers and sample preservatives (as appropriate) and for ensuring that all chemical analyses meet the project quality specifications detailed in the SAP.	Friedman & Bruya, Inc.	3012 16th Avenue West Seattle, Washington 98119	merdahl@friedmanandbruya.com	(206) 285-8282
Private Utility Locator (Subcontractor)	Kemp Garcia	Under the oversight of SoundEarth Strategies, Inc., clears all boring locations for utilities prior to drilling.	Bravo Environmental	6437 South 144th Street Tukwila, Washington	kgarcia@bravonw.com	(425) 424-9000
Site Superintendent/General Contractor	Jeff Cleator	Manages the construction excavation activities throughout the duration of the redevelopment project.	Lease Crutcher Lewis	107 Spring Street Seattle, Washington	jeff.cleator@lewisbuilds.com	(206) 689-0493
Surveyor (Subcontractor)	Brad Freeman	Conducts site survey of monitoring wells and key site features following the completion of well installation activities.	Triad Associates	12112 115th Avenue Northeast Kirkland, Washington	bfreeman@triadassoc.com	(425) 216-2140

NOTES:

QA/QC = quality assurance/quality control

SAP = Sampling Analysis Plan

Table A-3
Analytical Methods, Container, Preservation, and Holding Time Requirements
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Analyte and Analytical Method	Size and Type of Container	Number of Containers	Preservation Requirements	Holding Time
Vapor Samples				
GRPH by NWTPH Method NWTPH-Gx	Tedlar Bag	2	--	3 days
BTEX by EPA Method 8021B				
CVOCs by EPA Method 8260C	Tedlar Bag	2	--	3 days
Soil Samples				
GRPH by Method NWTPH-Gx	40-mL VOA	3	4°C/-7°C at the laboratory	48 hours/2 weeks
BTEX by EPA Method 8021B or 8260B				
CVOCs by EPA Method 8260C	40-mL VOA	3	4°C/-7°C at the laboratory	48 hours/2 weeks
Water Samples				
GRPH by Method NWTPH-Gx	40-mL VOA vial	3	HCl/4°C	14 days
BTEX by EPA Method 8021B				
CVOCs by EPA Method 8260C	40-mL VOA vial	3	4°C	7 days
DRPH and ORPH by Method NWTPH-Dx	500-mL amber	1	4°C	7 days
RCRA 8 Metals by EPA Method 200.8 and 1631E	500-mL poly	1	pH <2 HNO3/4°C	6 months/28 days (for mercury only)

NOTES:

°C = degrees Celsius

BTEX = benzene, toluene, ethylbenzene, and total xylenes

CVOCs = chlorinated volatile compounds

DRPH -= diesel-range petroleum hydrocarbons

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

HCl = hydrochloric acid

HNO3 = nitric acid

mL = milliliter

NWTPH = Northwest Total Petroleum Hydrocarbon

ORPH = oil-range petroleum hydrocarbons

RCRA = Resource Conservation and Recovery Act

VOA = volatile organic analysis

SoundEarth Strategies

Table A-4
Analytes, Analytical Methods, Laboratory Practical Quantitation Limits, and Applicable Regulatory Limits
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Analyte	Analytical Method	Unit	Laboratory PQL[1]	Applicable Regulatory Limit[2]
Soil Gas				
GRPH	NWTPH-Gx	mg/m^3	<10	1.4/14.0 (NC)
Benzene	EPA Method 8021B	mg/m^3	<0.1	0.0032/0.032 (C)
Toluene	EPA Method 8021B	mg/m^3	<0.1	22/220 (NC)
Ethylbenzene	EPA Method 8021B	mg/m^3	<0.1	4.6/46 (NC)
Total Xylenes	EPA Method 8021B	mg/m^3	<3	0.46/4.6 (NC)
PCE	EPA Method 8260C	mg/m^3	<0.2	0.096/0.96 (C)
TCE	EPA Method 8260C	mg/m^3	<0.2	0.0037/0.037 (C)
Vinyl chloride	EPA Method 8260C	mg/m^3	<0.2	0.0028/0.028 (C)
cis-1,2-DCE	EPA Method 8260C	mg/m^3	<0.2	0.16/1.6 (NC)
Soil				
GRPH	NWTPH-Gx	mg/kg	<2	30/100[a]
Benzene	EPA Method 8021B	mg/kg	<0.02	0.03
Toluene	EPA Method 8021B	mg/kg	<0.02	7
Ethylbenzene	EPA Method 8021B	mg/kg	<0.02	6
Total xylenes	EPA Method 8021B	mg/kg	<0.06	9
PCE	EPA Method 8260C	mg/kg	<0.025	0.05
TCE	EPA Method 8260C	mg/kg	<0.03	0.03
Vinyl chloride	EPA Method 8260C	mg/kg	<0.05	0.67
cis-1,2-DCE	EPA Method 8260C	mg/kg	<0.05	160
Water				
GRPH	NWTPH-Gx	µg/L	<100	800/1,000[a]/100,000[b]
Benzene	EPA Method 8021B	µg/L	<1	5/NE
Toluene	EPA Method 8021B	µg/L	<1	1,000/NE
Ethylbenzene	EPA Method 8021B	µg/L	<1	700/NE
Total xylenes	EPA Method 8021B	µg/L	<3	1,000/NE
DRPH	NWTPH-Dx	µg/L	<50	500/100,000[b]
ORPH	NWTPH-Dx	µg/L	<250	500/100,000[b]
PCE	EPA Method 8021B	µg/L	<1	5/NE
TCE	EPA Method 8260C	µg/L	<1	5/NE
Vinyl chloride	EPA Method 8260C	µg/L	<0.2	0.2/NE
cis-1,2-DCE	EPA Method 8260C	µg/L	<1	16/NE
Mercury	EPA Method 1631E	µg/L	<0.1	2/100[b]
Lead	EPA Method 200.8	µg/L	<1	15/2,000[b]
Chromium	EPA Method 200.8	µg/L	<1	50/2,750[b]
Arsenic	EPA Method 200.8	µg/L	<1	5/1,000[b]
Cadmium	EPA Method 200.8	µg/L	<1	5/500[b]

NOTES:

[1] Standard laboratory PQLs for Friedman & Bruya, Inc.

[2] MTCA Method A or B Cleanup Levels, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, revised November 2007.

[a] Cleanup levels for gasoline in soil and groundwater without benzene are 100 mg/kg and 1,000 µg/L, respectively. Cleanup levels for gasoline in soil and groundwater that also contain benzene are 30 mg/kg and 800 µg/L, respectively.

[b] King County Industrial Waste Local Discharge Limit.

< = less than

µg/L = micrograms per liter

C = carcinogenic

cis-1,2-DCE = cis-1,2-dichloroethylene

DRPH = diesel-range petroleum hydrocarbons

EPA = U.S. Environmental Protection Agency

GRPH = gasoline-range petroleum hydrocarbons

mg/kg = milligrams per kilogram

mg/m3 milligrams per cubic meter

MTCA = Washington State Model Toxics Control Act

NC = non-carcinogenic

NE = no King County Industrial Waste Local Discharge Limit established

ORPH = oil-range petroleum hydrocarbons

PCE = tetrachloroethylene

PQL = practical quantitation limit

TCE = trichloroethylene

SoundEarth Strategies

Table A-5
Quantitative Goals of Data Quality Objectives
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

		Precision[1]	Accuracy[2]			Completeness (%)[3]	Sensitivity[4]
Analyte	**Analytical Method**	**RPD (%)**	**Surrogate (% Recovery)**	**MS (% Recovery)**	**LCS (% Recovery)**		**PQL[5]**
Soil Gas							
GRPH	NWTPH-Gx	20	50-150	50-150	50-150	95	<10
Benzene	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.1
Toluene	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.1
Ethylbenzene	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.1
Total Xylenes	EPA Method 8021B	20	50-150	50-150	50-150	95	<3
PCE	EPA Method 8260C	20	50-150	50-150	50-150	95	<0.2
TCE	EPA Method 8260C	20	50-150	50-150	50-150	95	<0.2
Vinyl chloride	EPA Method 8260C	20	50-150	50-150	50-150	95	<0.2
cis-1,2-DCE	EPA Method 8260C	20	50-150	50-150	50-150	95	<0.2
Soil							
GRPH	NWTPH-Gx	20	50-150	50-150	50-150	95	<2
Benzene	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.02
Toluene	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.02
Ethylbenzene	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.02
Total Xylenes	EPA Method 8021B	20	50-150	50-150	50-150	95	<0.06
PCE	EPA Method 8260C	20	36-160	36-160	50-150	95	<0.025
TCE	EPA Method 8260C	20	36-160	36-160	50-150	95	<0.03
Vinyl Chloride	EPA Method 8260C	20	36-160	36-160	50-150	95	<0.05
cis-1,2-DCE	EPA Method 8260C	20	36-160	36-160	50-150	95	<0.05
Water							
GRPH	NWTPH-Gx	20	50-150	50-150	50-150	95	<100
Benzene	EPA Method 8021B	20	50-150	50-150	50-150	95	<1
Toluene	EPA Method 8021B	20	50-150	50-150	50-150	95	<1
Ethylbenzene	EPA Method 8021B	20	50-150	50-150	50-150	95	<1
Total Xylenes	EPA Method 8021B	20	50-150	50-150	50-150	95	<3
DRPH	NWTPH-Dx	20	50-150	50-150	50-150	95	<50
OPRH	NWTPH-Dx	20	50-150	50-150	50-150	95	<250
PCE	EPA Method 8260C	20	36-160	36-160	50-150	95	<1
TCE	EPA Method 8260C	20	36-160	36-160	50-150	95	<1
Vinyl Chloride	EPA Method 8260C	20	36-160	36-160	50-150	95	<0.2
cis-1,2-DCE	EPA Method 8260C	20	36-160	36-160	50-150	95	<1
Mercury	EPA Method 1631E	20	50-150	50-150	50-150	95	<0.1
Lead	EPA Method 200.8	20	50-150	50-150	50-150	95	<1
Chromium	EPA Method 200.8	20	50-150	50-150	50-150	95	<1
Arsenic	EPA Method 200.8	20	50-150	50-150	50-150	95	<1
Cadmium	EPA Method 200.8	20	50-150	50-150	50-150	95	<1

NOTES:

[1] Precision measured in RPD between sample and lab duplicate, LCS and LCS duplicate, and/or MS and MS duplicate.

[2] Laboratory to follow in accordance with the EPA SW-846 and Ecology methods and procedures for inorganic and organic chemical analyses. Method Blanks will be analyzed for each analyte in addition to the quantitative data quality objectives listed in this table.

[3] Refers to the minimum acceptable percentages of samples received at the laboratory in good condition that are acceptable for analysis.

[4] Sensitivity is measured by the laboratory PQL for each analyte.

[5] Standard PQLs for Friedman & Bruya, Inc., standard PQLs.

< = less than
cis-1,2-DCE = cis-1,2-dichloroethylene
DRPH = diesel-range petroleum hydrocarbons
Ecology = Washington State Department of Ecology
EPA = U.S. Environmental Protection Agency
GRPH = gasoline-range petroleum hydrocarbons
LCS = laboratory control sample
MS = matrix spike
NWTPH = Northwest Total Petroleum Hydrocarbon Method
ORPH = oil-range petroleum hydrocarbons
PCE = tetrachloroethylene
PQL = practical quantitation limit
RPD = relative percent difference
TCE - trichloroethylene

ATTACHMENT A
FIELD FORMS

SoundEarth Strategies
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102
P: (206) 306-1900 F: (206) 306-1907

FIELD REPORT

Page 1 of ___

Client & Site Name/Number:		**SoundEarth Project Number:**	**Date:**
Site Address:		**Purpose of Visit/Task #:**	**Field Report Prepared by:**
Temp/Weather:	**Permit Required to Work:**	**Time of Arrival/Departure** (2400): __________ to __________ onsite offsite	**Personnel Onsite:**

Attachments:

Client: _____________ **Project No.:**_____________

Site Name/Number: _____________ **Date:**_____________

Page 2 of ____

Client: _____________

Site Name/Number: _____________

Project No.:_____________

Date:_____________

Page 3 of ____

SoundEarth Strategies

Project:
Project Number:
Logged by:
Date Started:
Surface Conditions:
Well Location N/S:
Well Location E/W:
Reviewed by:
Date Completed:

BORING LOG

Site Address:

Water Depth At Time of Drilling: feet bgs
Water Depth After Completion: feet bgs

Depth (feet bgs)	Interval	Blow Count	% Recovery	PID (ppm)	Sample ID	USCS Class	Graphic	Lithologic Description	Well Construction Detail
0									
5									
10									
15									

Drilling Co./Driller:
Drilling Equipment:
Sampler Type:
Hammer Type/Weight: lbs
Total Boring Depth: feet bgs
Total Well Depth: feet bgs
State Well ID No.:

Well/Auger Diameter: inches
Well Screened Interval: feet bgs
Screen Slot Size: inches
Filter Pack Used:
Surface Seal:
Annular Seal:
Monument Type:

Notes/Comments:

Page:

Project:
Project Number:
Logged by:
Date Started:
Surface Conditions:
Well Location N/S:
Well Location E/W:
Reviewed by:
Date Completed:

BORING
LOG

Site Address:

Water Depth At Time of Drilling: feet bgs
Water Depth After Completion: feet bgs

Depth (feet bgs)	Interval	Blow Count	% Recovery	PID (ppm)	Sample ID	USCS Class	Graphic	Lithologic Description	Well Construction Detail
15									
20									
25									
30									

Drilling Co./Driller:
Drilling Equipment:
Sampler Type:
Hammer Type/Weight: lbs
Total Boring Depth: feet bgs
Total Well Depth: feet bgs
State Well ID No.:

Well/Auger Diameter: inches
Well Screened Interval: feet bgs
Screen Slot Size: inches
Filter Pack Used:
Surface Seal:
Annular Seal:
Monument Type:

Notes/Comments:

Page:

SoundEarth Strategies

GROUNDWATER PURGE AND SAMPLE FORM
LOW FLOW PUMP

General Info

Client: ____________________ Project #: ____________________

Site Name/ #: ____________________ Field/Sampling Personnel: ____________________ **Well ID Number:** ____________________

Well Details

Total Depth (TD)	Depth to Water (DTW) (Immediately Prior to Purging)	Water Column (WC) =TD-DTW	Casing Diameter Volume Conversion Factor (VC)					Casing Volume =WC x VC
			0.75”	1”	2”	4”	6”	
Feet BTOC	Feet BTOC	Feet BTOC	0.023	0.041	0.16	0.65	1.44	gallons

Screened Interval: __________ to __________ Feet bgs

Screen Submerged? ☐ **NO** ⟹ Place tubing intake 2 to 3 feet below depth to water
☐ **YES** ⟹ Place tubing intake at approximate center of screen

Equipment

Pump Method: ☐ Peristaltic ☐ Other: __________ Owner/ID #: __________ **Water Quality Meter** Brand/Model: __________ Owner/ID #: __________

Water Level Instrument: ☐ WL Meter ☐ Bubbler ☐ Interface ☐ Other: __________ Owner/ID #: __________

Sampling

Depth of Tubing Intake: ______ Feet BTOC Time Start Purge: __________

Time (3-5 min intervals)	Water Level (feet) drawdown <0.33 feet	**Purge Rate** (L/min) 0.1 – 0.5	**pH**[1] *± 0.1*	**Specific Conductivity**[1] **UNITS:** ________ *± 3%*	**Turbidity**[1] (NTU) *If ≥10, ±10%* *if <10, stabilized*	**Dissolved Oxygen**[1] (mg/L) *If ≥1.00, ± 10%* *if ≤1.00, ± 0.2*	Temperature (ºC)	ORP (mV)
				Minimum # of Readings				

Sample Date: __________ **Sample Time:** __________ **Field Duplicate Sample Time:** __________ **Time Sampling Ended:** __________

Sampling Comments: ____________________

Analytical

Sample Number/ID	Container Type	Preservative	Field Filtered?			Analysis Request
			No	0.45	0.10	
			No	0.45	0.10	
			No	0.45	0.10	
			No	0.45	0.10	
			No	0.45	0.10	
			No	0.45	0.10	

Purge Water

Sheen? ☐ NO ☐ YES **Odor?** ☐ NO ☐ YES ⟹ Describe: ____________________ Color (describe): ____________________

Total Discharged (1Gal = 3.88 liter): __________ gallons Disposal Method: ☐ Drummed ☐ Remediation System ☐ Other: __________

Well Condition

Well/Security Devices in good condition (i.e.: Monument, Bolts, Seals, J-cap, Lock)? ☐ YES ☐ NO ⟹ Describe: ____________________

Water in Monument? ☐ NO ☐YES ⟹ Describe: ____________________

Additional Well Condition Comments or Explanation of any Access Issues: ____________________

---

[1] At minimum, pH, specific conductivity, and dissolved oxygen and/or turbidity must stabilize within the limits (indicated in *italics*) for three successive readings prior to sampling.

GROUNDWATER PURGE AND SAMPLE FORM
LOW FLOW PUMP – *Continued*

General Info

Client: ________________ Project #: ________________________

Site Name/ #: ________________ Field/Sampling Personnel: ________________________ **Well ID Number:** ____________________________

See Page 1 for well construction and purge water information

Sample Date: ________________ **Sample Time:** _____________ **Field Duplicate Sample Time:** ________________ **Time Sampling Ended:** ________________

Sampling *(Continued from Page 1)*

Time (3-5 min intervals)	Water Level (feet) drawdown <0.33 feet	**Purge Rate** (L/min) 0.1 – 0.5	**pH**[1] *± 0.1*	**Specific Conductivity**[1] **UNITS:** ___________ *± 3%*	**Turbidity**[1] (NTU) *If ≥10, ±10%* *if <10, stabilized*	**Dissolved Oxygen**[1] (mg/L) *If ≥1.00, ± 10%* *if ≤1.00, ± 0.2*	Temperature (ºC)	ORP (mV)

Additional Sampling Comments: ____

---

[1] At minimum, pH, specific conductivity, and dissolved oxygen and/or turbidity must stabilize within the limits (indicated in *italics*) for three successive readings prior to sampling.

FRIEDMAN & BRUYA, INC.

Client:

Sample ID:

Date Sampled: Time:

Project:

Analysis Request:

Preservative:

SAMPLE CHAIN OF CUSTODY

Send Report to ________________________________ ____

Company________SoundEarth Strategies, Inc.____________

Address_________2811 Fairview Avenue E, Suite 2000_ __

City, State, ZIP ______Seattle, WA 98102___ ______ ________

Phone #____206-306-1900_____Fax #____206-306-1907__

SAMPLERS *(signature)*	
PROJECT NAME/NO.	PO #
REMARKS	

Page # _________ of _________

TURNAROUND TIME
Standard (2 Weeks)
RUSH____________________
Rush charges authorized by:
____

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions

Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of Jars	ANALYSES REQUESTED								Notes
								DRPH & ORPH by NWTPH-Dx	GRPH by NWTPH-Gx	VOCs by EPA 8260C	RCRA 8 Metals by EPA 200.8 & 1631E					

Friedman & Bruya, Inc.
3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:				
Received by:				
Relinquished by:				
Received by:				

SoundEarth Strategies

DRUM INVENTORY SHEET

Site Name: ______________________________
Site Address: ______________________________
Reason for Site Visit: ______________________________
Date of Inventory: ______________________________
Field Personnel: ______________________________
____

Drum #[1] (eg. 001)	Content Information	Date(s) Accumulated	Fullness (%)	Sample Analysis Performed?	Composite Soil Sample (RCRA 8 metals) [2] (Y/N)	Saturated Soil[3] (Y/N)	Drum Labeled (Y/N)	Drum Location Photo (Y/N)	Drum Access[4]
Eg. 001	Soil, B05, 5'-15'	2/3/10	100%	Gx, BTEX	Y	N	Y	Y	Combo lock #xxxx
Eg. 002	Purge Water	2/3/10	100%	Gx, BTEX	N/A	N/A	Y	Y	Combo lock #xxxx

NOTES:

[1] Drum #— Write the Drum # on the drum lid, as well as on the non-hazardous or hazardous waste labels.

[2] Composite Soil Sample—For all sites, collect one composite soil sample from each drum onsite. Place sample on hold at the laboratory, for future RCRA 8 metals analysis. Collect sample in one-4 ounce jar.

[3] Saturated soil—Add bentonite chips or kitty litter to the water that has accumulated or may accumulate inside the drum. Bentonite chips available in the garage.

[4] Drum access for pickup—(eg. fenced, owner notification, lock combination?)

Page ________ of ________

NON HAZARDOUS WASTE

GENERATOR INFORMATION (Optional)

SHIPPER ____________________

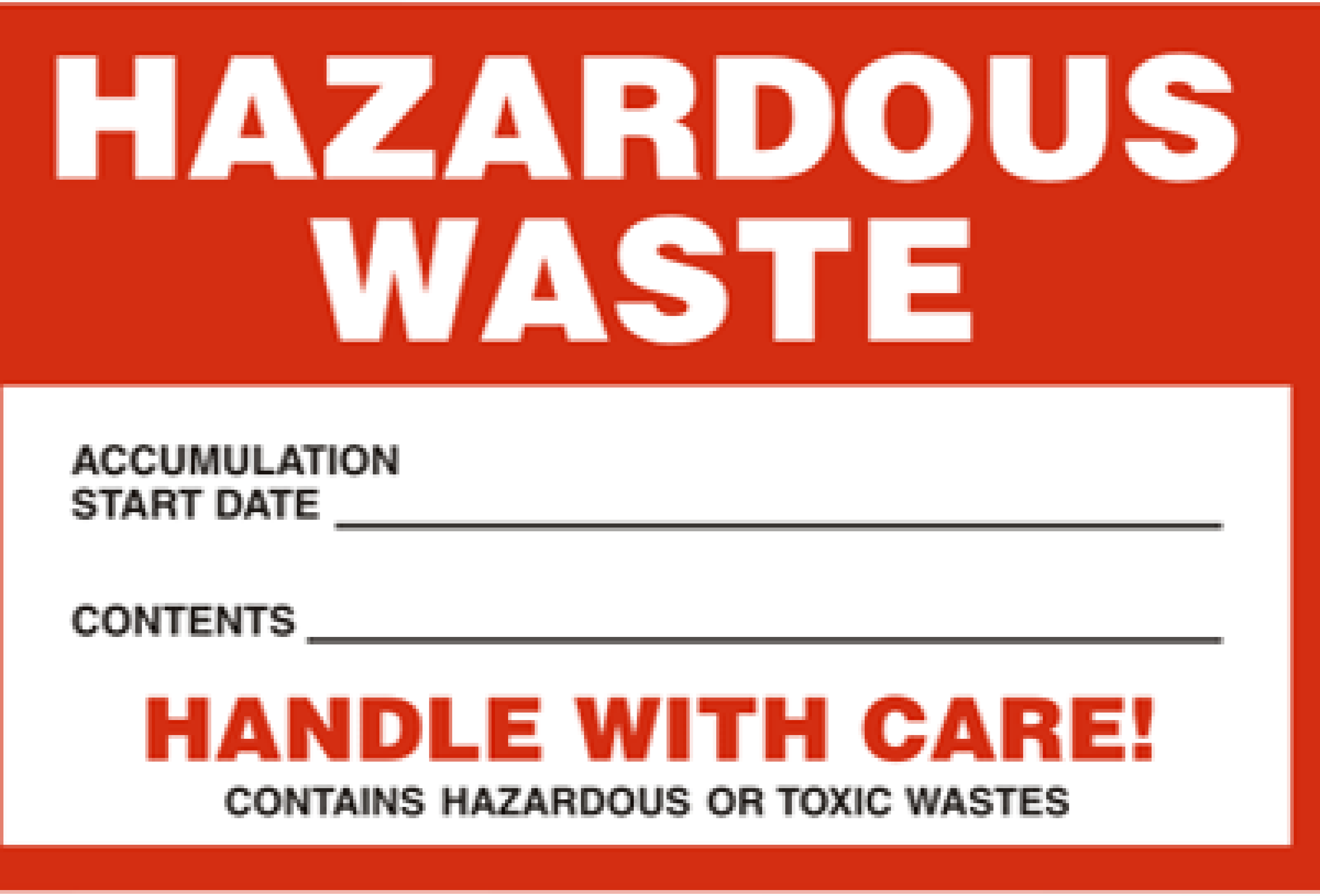
ADDRESS ____________________

CITY, STATE, ZIP ____________________

CONTENTS ____________________

____

NON-HAZARDOUS WASTE



HAZARDOUS WASTE

ACCUMULATION START DATE ________________________

CONTENTS ________________________

HANDLE WITH CARE!

CONTAINS HAZARDOUS OR TOXIC WASTES

SoundEarth Strategies

Material Import and Export Summary

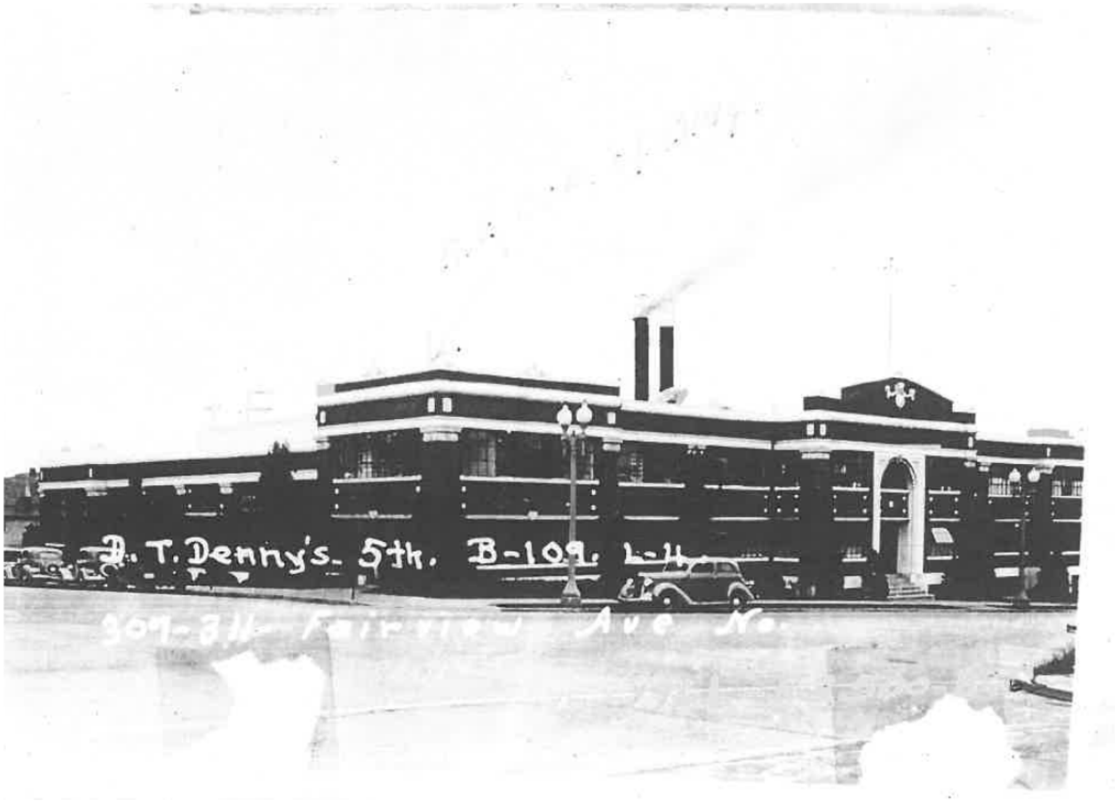
Truck Company	Truck Number	Date	Time	Volume (note: tons or yards)	Type of Material	Destination of Material

APPENDIX B
HEALTH AND SAFTELY PLAN

SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102

HEALTH AND SAFETY PLAN

APPENDIX B OF THE DRAFT INTERIM ACTION PLAN



Property:
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington
Ecology Facility ID: 19135499

Prepared for:
Touchstone SLU LLC
2025 First Avenue, Suite 1212
Seattle, Washington

Report Date:
January 30, 2013

Health and Safety Plan

Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington 98121
Ecology Facility ID: 19135499

Prepared for:

Touchstone SLU LLC
2025 First Avenue, Suite 1212
Seattle, Washington 98121

Project No.: 0731-004

Prepared by:

Suzy Stumpf, PE
Associate Engineer

Terry Montoya, PE
Principal Engineer

Reviewed by:

Erin K. Rothman, MS
Principal Scientist

Initiation Date: June 1, 2013
Expiration Date: June 1, 2014

SoundEarth Strategies

HAZARD SUMMARY

SoundEarth Strategies, Inc. has prepared this Health and Safety Plan for Troy Laundry Property, located at 307 Fairview Avenue North in Seattle, Washington (the Property). The Health and Safety Plan was written in general accordance with the Washington State Model Toxics Control Act as promulgated in Chapter 173-340-350 of the Washington Administrative Code.

SITE DESCRIPTION

The Site is located on a topographically low-lying area within the downtown area of the City of Seattle. Elevations range from 68 feet (northwest corner of the Property) to 105 feet (southeast corner of the Property) above NAVD88 and slope toward the northwest. Lake Union is located approximately 0.4 miles to the north of the Site, and Elliot Bay is located approximately 1.5 miles to the west of the Site.

The Property was initially developed prior to 1893 with residences. Residences exclusively occupied the Property until 1925, when the David Smith Building was constructed on the northwestern corner of the Property. The Troy Building was constructed between 1926 and 1927, and the Mokas Building was constructed in 1960. According to historical records, by 1948, the Property operated as one of the Pacific Northwest's largest laundry and dry cleaning facilities. At least 15 underground storage tanks containing heating oil, fuel, and dry cleaning solvents, as well as several aboveground storage tanks containing propane, wash water, water-softening agents, dry cleaning solvents, and heating oil, were used on the Property.

Based upon the findings of previous investigations, including the remedial investigation, the Site includes soil, soil vapor, and/or groundwater contaminated with gasoline-, diesel-, and oil-range petroleum hydrocarbons tetrachloroethylene; trichloroethylene; cis-1,2-dichloroethylene; and/or vinyl chloride beneath the Property, as well as beneath portions of the Boren Avenue North and Thomas Street rights-of-way, as well as trichloroethylene in the Terry Avenue North right-of-way.. The impacts beneath the Site likely are associated with a release of chlorinated solvents from the industrial laundry and dry cleaning facility that operated on the Property from 1927 to 1985. The highest concentrations of chlorinated and Stoddard solvents are located in the center of the Property near the loading dock.

FIELD ACTIVITIES

- Excavation oversight
- Subsurface soil sampling
- Well installation
- Pressurized injections
- Groundwater sampling and monitoring

SITE HAZARDS

Hazards present at the Site include the following:

Chemical

- trichloroethene in soil, groundwater, and soil vapor

HAZARD SUMMARY (CONTINUED)

- cis-1,2-dichloroethylene in groundwater and soil vapor
- vinyl chloride in groundwater
- gasoline-range petroleum hydrocarbons as Stoddard solvents in soil, groundwater, and soil vapor
- diesel-range petroleum hydrocarbons in soil and groundwater
- oil-range petroleum hydrocarbons in soil and groundwater

Physical

- Compressed air
- Confined spaces
- Electrical hazards
- Ergonomic hazards
- Flammable liquids
- Heavy equipment/moving machinery
- Hot work
- Noise exposure
- Overhead utilities and features
- Potentially flammable or explosive environment
- Pressurized injectate
- Slips, trips, and falls
- Temperature extremes
- Traffic and moving equipment
- Underground utilities and features
- Unsecure/uncontrolled site
- Unstable ground
- Hazardous processes
- Work at heights
- Work near water

HAZARD CONTROLS

The following hazard controls, based on the tasks identified in the Fieldwork Activities above, are required for employees of SoundEarth while performing work on the Site:

- Level D personal protective equipment, which includes hard hats, steel-toed boots, safety glasses, and a reflective safety vest
- Nitrile gloves

HAZARD SUMMARY (CONTINUED)

- Noise protection while drilling
- Lockout/tag-out procedures when disconnecting and cutting electrical lines
- Splash shield during injections
- Caution tape and traffic control in all parking areas and on streets

This hazard summary is presented solely for introductory purposes, and the information contained in this section should be used only in conjunction with the full text of this report. A complete description of the project, site conditions, investigation methods, and investigation results can be found in previous reports referenced in Section 5.1.1, Reports that Provide Chemical Data.

TABLE OF CONTENTS

FIGURES

ATTACHMENTS

1.0 INTRODUCTION

This Health and Safety Plan (HASP) was written for the use of SoundEarth Strategies Inc. (SoundEarth) and its employees. The health and safety and emergency response protocols outlined in this plan are designed to ensure compliance with state and federal regulations governing worker safety on hazardous waste sites. The Department of Labor has published final rules (Part 1910.120 of Title 29 of the Code of Federal Regulations, March 6, 1990) that amend the existing Occupational Safety and Health Administration standards for hazardous waste operations and emergency response. Within the Washington State, these requirements are addressed in Washington Administrative Code (WAC 296-843), Hazardous Waste Operations. These regulations apply to the activities to be performed at this Site as a site remediation, or cleanup, under the Federal Resource Conservation and Recovery Act of 1976 and/or Washington State Model Toxics Control Act.

Subcontractors to SoundEarth are required to prepare and effectively implement their own HASP based on their unique scope of work and professional expertise. Each subcontractor's HASP must comply with all applicable federal, state, and local regulations. The subcontractor's HASP should employ appropriate best practices to protect all personnel working on the Site, as well as the public, and to prevent negative impacts to the project or site.

The responsibilities of SoundEarth for safety on this Site are limited to:

- **Implementation** of the provisions of this HASP for the protection of its employees and visitors on the Site to the extent that the Site and its hazards are under the control of SoundEarth.
- **Protection of the Site**, other personnel, and the public from damage, injury, or illness as a result of the activities of SoundEarth and its employees while on the Site.
- **Provision** of additional safety-related advice and/or management as contractually determined between the parties.

This plan is active for this Site until 1 year from the date of the HASP or until SoundEarth implements a scope of work change not covered by this HASP, whichever comes first, after which time it must be reviewed and extended.

NOTE: Reference identifications (08-01, Project Responsibilities through 08-23, Work Near Water) incorporated into this HASP refer to the *HASP Reference Manual*, prepared by SoundEarth and dated January 2011, which is a stand-alone document that compiles detailed information and instructions for protecting SoundEarth employees from chemical and physical hazards applicable to this HASP. The *HASP Reference Manual* and this HASP **MUST** be present at the Site during field activities.

2.0 SITE INFORMATION

Site Name: Troy Laundry Property

Site Address: 307 Fairview Avenue North, Seattle, Washington

Site Owner: Touchstone SLU LLC

Site Tenant: David Smith Antiques (Retail), Integrity Interior Solutions

Nature of Activities at this Site:

Current: retail furniture sales and storage

Past: Commercial and industrial-scale laundry and dry cleaning services, vehicle refueling, and residential single-family residences.

Figures B-1 and B-2 show the Site location and features.

3.0 PROJECT RESPONSIBILITIES

Site personnel shall acknowledge that they have reviewed a copy of the HASP for this project, that they understand it, and that they agree to comply with all of its provisions by signing and dating the Acknowledgement and Agreement form found in Attachment A.

A daily health and safety tailgate meeting shall take place at the start of every day in the field. Persons attending this meeting are to print and sign their name on the attached Daily Health and Safety Briefing Log, found in Attachment B.

(Reference 08-01, Project Responsibilities, provides more information.)

4.0 EMERGENCY INFORMATION

For a critical emergency, 911 should be called. (The definition of critical emergency can be found in Reference 08-02, Emergency Response Plan.)

Note: A SoundEarth employee MAY NOT transport a non-SoundEarth employee off of the Site for medical attention.

Local Emergency Numbers

Institution/Department	Name/Address	Phone Number
Hospital	Virginia Mason Medical Center 1100 Ninth Avenue Seattle, Washington	911 or (206) 223-6600
Alternative Hospital	Harborview Medical Center 325 Ninth Avenue Seattle, Washington	911 or (206) 731-3000

Local Emergency Numbers		
Institution/Department	**Name/Address**	**Phone Number**
Ambulance		911
Police/Sheriff	City of Seattle Police Department, East Precinct 1519 12th Avenue Seattle, Washington	911 or (206) 684-4300
Fire	City of Seattle Fire Department, Station # 22 901 East Roanoke Street Seattle, Washington	911

Project Emergency Numbers		
Title	**Name**	**Phone Number**
Project Manager	Erin K. Rothman	O: (206) 306-1900 C: (206) 795-0978
Site Manager/Health and Safety Officer	Chris Cass	O: (206) 306-1900 C: (425) 765-4490
Principal-in-Charge	Berthin Q. Hyde	O: (206) 306-1900 C: (206) 790-9574
Corporate Health and Safety Representative	Chris Carter	O: (206) 436-5901 C: (206) 618-0306
Certified Industrial Hygienist working for SoundEarth	Michelle Copeland	O: (206) 612-6355
General Contractor	Jeff Cleator, Lease Crutcher Lewis	O: (206) 689-0493 C: (206) 571-3527
Private Utility Locate	Kemp Garcia, Bravo Environmental	O: (206) 282-1866
Public Utility Locate	Utility Notification Center	O: (800) 424-5555

Attachment C, Hospital Routes, provides the location and driving directions. The routes must be posted at the Site.

5.0 GENERAL SITE HAZARD ANALYSIS

This section is used to determine the project's potential health and safety hazards specifically as they relate to the Site where the work will occur. Task-related hazards are analyzed in Section 6.0, Task-Related Site Hazard Analysis.

5.1 GENERAL SITE HAZARD ANALYSIS—CHEMICAL

This section is used to determine the project's potential health and safety hazards specifically as they relate to the Site where the work will occur. Task-related hazards are analyzed in Section 6.0, Task-Related Site Hazard Analysis.

5.1.1 Reports that Provide Chemical Data

- Records, Letters, and Laboratory Analytical Results for waste generated and underground storage tanks (USTs) located on the Property. Seattle Times Company. 1986.
- The RETEC Corporation. Letter to Mr. Eric Rosenbrock, Facility operation Manager, the Seattle Times. October 26, 1994.
- Final Report No. 20670007: Troy Laundry, Seattle, Washington. Prepared by W.L. Gore and Associates. September 8, 2010.
- Letter Summary of Limited Phase II Environmental Assessment at the Troy Laundry Property, 307 Fairview Avenue North, Seattle; Washington. Prepared by Sound Environmental Strategies Corporation. October 28, 2010.
- December 2010 Investigation Results and SVE Conceptual System Design Troy Laundry Property, Seattle, Washington. Prepared by AECOM. January 12, 2011.
- Summary of Supplemental Subsurface Investigation Activities at the Troy Laundry Property, 307 Fairview Avenue North, Seattle, Washington. Prepared by SoundEarth Strategies, Inc. June 6, 2011.
- Draft Remedial Investigation Report, Troy Laundry Property. Prepared by SoundEarth Strategies, Inc. May 2, 2012.

5.1.2 Summary of Potential Chemical Hazards

- tetrachloroethylene (PCE) in soil, groundwater, and soil vapor
- trichloroethene (TCE) in soil, groundwater, and soil vapor
- cis-1,2-dichloroethylene in groundwater and soil vapor
- Vinyl chloride in groundwater
- gasoline-range petroleum hydrocarbons (GRPH) as Stoddard solvents in soil, groundwater, and soil vapor
- diesel-range petroleum hydrocarbons in soil and groundwater
- oil-range petroleum hydrocarbons in soil and groundwater

5.1.3 Past Opportunities for Chemical Contamination

The Property was used as a retail and industrial laundry and dry cleaner. Both chlorinated- and petroleum-based dry cleaning solvents were used and stored at the Property. Petroleum hydrocarbons also were used and stored on the Property.

5.1.4 Opportunities for Unknown or Unidentified Chemical Contamination

The following opportunities for unknown or unidentified chemical contamination have been identified:

- The Troy Laundry Company operated on the Property from 1926 until 1985 and was equipped with at least 15 USTs that were used to store fuel, heating oil, and solvents. Additional structures associated with the former operations include several trenches and below-grade pipes, vaults, catch basins, and drains that formerly contained dangerous waste.
- The three buildings located on the Property were constructed between 1926 and 1960 and may contain hazardous materials such as asbestos and lead.

5.1.5 Existing Controls in Place

The building slabs and asphalt-paved parking lots cap in place and limit direct contact with any residual soil or groundwater contamination that may have resulted from the historical operations described in Section 5.1.3.

5.1.6 Chemical Analytical Results

The soil analytical data collected during the investigations conducted at the Site indicate that GRPH as Stoddard solvents and chlorinated solvent concentrations were highest in the center of the Property near the loading dock, which is the probable source area. The high concentrations of PCE in soil and perched groundwater in the vadose zone are inferred to be evidence of a release from the former dry cleaning facility that operated on the Property. Concentrations of chemicals of concern in the soil decrease rapidly—both horizontally and vertically—with distance from the source area. Beyond the high source area concentrations, which are to be limited vertically by a dense silt layer that appears to have restricted vertical contaminant migration, the vertical and lateral distribution of PCE concentrations is relatively consistent throughout the southwestern portion of the Property. The widespread extent of PCE in soil exhibiting relatively low concentrations is indicative of a long-term release via vapor-phase diffusion. The soil contamination appears to be limited to within the Property boundaries.

Impacts to groundwater within the primary water-bearing zone extend approximately 350 north-south and up to 240 feet east-west, generally trending west-southwest from the source area. Concentrations of chlorinated solvents within the groundwater are relatively low; the highest on-Property concentration of PCE in groundwater (21 micrograms per liter) was collected from MW11, which was installed near the source area. With the exception of groundwater collected from wells MW05 and MW13, groundwater collected from wells installed beyond the Property boundary exhibited only TCE exceedances, also observed at relatively low concentrations. Likewise, groundwater collected from the two impacted deep wells (MW09 and MW12) also did not contain detectable concentrations of PCE, which is consistent with the peripheral degradation of chlorinated solvents within the primary water-bearing zone.

Data collected from wells north of the Property confirm that no risks to surface water or sediment exist as a result of the release at the Property, and that ongoing risks to human health and the environment as a result of vapor intrusion will be mitigated following excavation of the source area, as discussed in the proceeding sections. Empirical evaluation of the lateral distribution of groundwater contamination, which is present at relatively low concentrations in the primary water-bearing zone, was limited to the south and west as a result of physical and technological constraints and was therefore supplemented by a conservative mathematical model approach that allowed for the definition of the worst-case extent of groundwater contamination. The evaluation of the vertical distribution of contamination in groundwater was conducted by sampling the former supply well on the Property, which was installed to a depth of approximately 498 feet below ground surface. The results of sampling conducted at the well demonstrated that the deeper aquifer beneath the Site has not been impacted by a release from the former property operations.

Analytical data associated with the investigations conducted at the Site are available in the Draft Remedial Investigation Report prepared by SoundEarth in 2012.

TABLE 1 CHEMICAL HAZARDS

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure Warning Properties	Exposure Symptoms	Target Organs	Recommended PPE Respiratory Protection	Recommended Monitoring/ Sampling Method
1,2-DCE (1,2-Dichloroethylene, and cis- or trans-isomers)	DOSH PEL: 200 ppm TWA 250 ppm STEL	NIOSH REL: 200 ppm TWA IDLH: 1,000 ppm FP: 36–39°F LEL: 5.6%	Inhalation, ingestion, skin or eye contact Slightly acidic, chloroform-like odor	Eye and respiratory system irritation, central nervous system depression	Eyes, respiratory system, central nervous system	▪ Impermeable, chemical-resistant, disposable clothing ▪ Silver Shield/ composite glove If PEL is exceeded, min SA continuous flow or PAPR OV cartridge	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 10.2 or 10.6 eV PID

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure Warning Properties	Exposure Symptoms	Target Organs	Recommended PPE Respiratory Protection	Recommended Monitoring/ Sampling Method
Ethylbenzene	DOSH PEL: 100 ppm TWA 125 ppm STEL	NIOSH REL: 50 ppm TWA 100 ppm STEL IDLH: 700 ppm FP: 55°F LEL: 0.8%	Inhalation, ingestion, skin or eye contact Sweet, floral odor	Irritation of eyes, skin, nose, respiratory system; dizziness; headache; drowsiness; unsteady gait; defatting; inflammation of skin; possible liver injury; reproductive effects	Eyes, skin, central nervous system, liver, respiratory system, reproductive system Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	▪ Impermeable, chemical resistant disposable clothing ▪ Silver Shield/ composite glove If PEL is exceeded, min ½ Mask AP with OV cartridge	If potential for exposure exists: Initial personal air sampling Additional sampling if necessary based on initial results Verify method with laboratory prior to ordering media and equipment Real Time: 10.2 or 10.6 eV PID

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure Warning Properties	Exposure Symptoms	Target Organs	Recommended PPE Respiratory Protection	Recommended Monitoring/ Sampling Method
Stoddard Solvent	DOSH PEL 100 ppm TWA 150 ppm STEL OSHA PEL 500 ppm TWA	IDLH: 20,000 mg/m^3 FP: 102-110^{o}F	Inhalation, ingestion, skin or eye contact Kerosene-like odor	Irritation eyes, nose, throat; dizziness; dermatitis; chemical pneumonitis (aspiration liquid); in animals: kidney damage	Eyes, skin, respiratory system, central nervous system, kidneys	▪ Impermeable, disposable clothing ▪ Nitrile or Neoprene gloves If PEL is exceeded: ▪ min ½ Mask AP with OV cartridge	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 9.8 eV PID

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure	Exposure Symptoms	Target Organs	Recommended PPE	Recommended Monitoring/ Sampling Method
			Warning Properties			Respiratory Protection	
Tetra-chloroethylene (PCE)	DOSH PEL 25 ppm TWA 38 ppm STEL Skin OSHA PEL 100 ppm TWA	IDLH: 150 ppm Carcinogen	Inhalation, ingestion, skin absorption, skin or eye contact	Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]	Eyes, skin, respiratory system, liver, kidneys, central nervous system	▪ Impermeable, chemical resistant disposable clothing ▪ Nitrile	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 10.2 or 10.6 eV PID
			Mild, chloroform-like odor			If PEL is exceeded, any SA respirator in positive pressure/ pressure demand mode	

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure	Exposure Symptoms	Target Organs	Recommended PPE	Recommended Monitoring/ Sampling Method
			Warning Properties			Respiratory Protection	
Toluene	DOSH PEL: 100 ppm TWA 150 ppm STEL OSHA PEL: 200 ppm TWA C 300 ppm 500 ppm (10-minute maximum peak)	NIOSH REL: 100 ppm TWA 150 ppm STEL IDLH: 500 ppm FP: 40°F LEL: 1.1%	Inhalation, ingestion, skin absorption, skin or eye contact	Irritation of eyes and nose, weakness, exhaustion, confusion, euphoria, dizziness, headache, dilated pupils, tear discharge, anxiety, muscle fatigue, insomnia, tingling, prickling, and inflammation of skin, liver, kidney damage	Eyes, skin, respiratory system, central nervous system, liver, kidneys	▪ Impermeable, chemical-resistant, disposable clothing ▪ Nitrile or Silver Shield gloves (for more extensive contact)	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 9.8 eV PID
			Sweet, pungent benzene-like odor			If PEL is exceeded, min ½ Mask AP with OV cartridge	

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure	Exposure Symptoms	Target Organs	Recommended PPE	Recommended Monitoring/ Sampling Method
			Warning Properties			Respiratory Protection	
TPH as Diesel or Oil (petroleum distillates as a surrogate)	DOSH PEL: 100 ppm TWA 150 ppm STEL OSHA PEL: 500 ppm TWA	NIOSH REL: 86 ppm TWA 444 ppm STEL IDLH: 1,100 ppm FP: -40 to -86°F LEL: 1.1%	Inhalation, ingestion, skin or eye contact	Irritation of eyes, nose, throat; dizziness; drowsiness; headache; nausea; dry cracked skin; inflammation of lungs	Eyes, skin, respiratory system, central nervous system	▪ Impermeable, chemical-resistant, disposable clothing ▪ Nitrile or Neoprene gloves	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 10.2 or 10.6 eV PID
			Gasoline or kerosene-like odor			If PEL is exceeded, any SA respirator	

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure / Warning Properties	Exposure Symptoms	Target Organs	Recommended PPE / Respiratory Protection	Recommended Monitoring/ Sampling Method
TPH as Gasoline	DOSH PEL: 300 ppm TWA 500 ppm STEL OSHA PEL: None	FP: -45°F LEL: 1.4%	Inhalation, ingestion, skin absorption, skin or eye contact Characteristic odor	Irritation of eyes, skin, and mucous membranes; inflammation of skin and lungs; headache; weakness; exhaustion; blurred vision; dizziness, slurred speech; confusion; convulsions; possible liver and kidney damage; (potential occupational carcinogen)	Eyes, skin, respiratory system, central nervous system, liver, kidneys	▪ Impermeable, chemical-resistant, disposable clothing ▪ Nitrile gloves If PEL is exceeded, any SA respirator in positive pressure/ pressure demand mode	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 10.2 or 10.6 eV PID

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure	Exposure Symptoms	Target Organs	Recommended PPE	Recommended Monitoring/ Sampling Method
			Warning Properties			Respiratory Protection	
Trichloroethylene	DOSH PEL: 50 ppm TWA 200 ppm STEL OSHA PEL: 100 ppm TWA 200 ppm STEL 300 C	IDLH: 1,000 ppm LEL: 8%	Inhalation, skin absorption, ingestion, skin or eye contact	Irritation of eyes and skin; headache; visual disturbance; weakness; exhaustion; dizziness; tremor; drowsiness; nausea; vomiting; tingling, pricking, and inflammation of skin; cardiac arrhythmias; liver injury (potential occupational carcinogen)	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system	▪ Impermeable, chemical resistant disposable clothing ▪ Nitrile gloves	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 10.2 or 10.6 eV PID
			Chloroform-like odor			If PEL is exceeded, min full-face SA respirator in positive pressure/ pressure demand mode	

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure Warning Properties	Exposure Symptoms	Target Organs	Recommended PPE Respiratory Protection	Recommended Monitoring/ Sampling Method
Vinyl Chloride	DOSH PEL 1 ppm TWA 5 ppm STEL	Gas (FP N/A) LEL: 3.6% Carcinogen	Inhalation, ingestion, skin or eye contact Pleasant odor at high concentrations	Lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]	Liver, central nervous system, blood, respiratory system, lymphatic system	▪ Impermeable, chemical resistant disposable clothing ▪ Silver Shield / composite gloves If PEL is exceeded, any SA respirator in positive pressure/ pressure demand mode	If potential for exposure exists: ▪ Initial personal air sampling ▪ Additional sampling if necessary based on initial results ▪ Verify method with laboratory prior to ordering media and equipment Real Time: ▪ 10.2 or 10.6 eV PID

Chemical (or Class)	DOSH PEL/AL (OSHA PEL if different)	Other Pertinent Limits	Routes of Exposure Warning Properties	Exposure Symptoms	Target Organs	Recommended PPE Respiratory Protection	Recommended Monitoring/ Sampling Method
Xylenes	DOSH PEL: 100 ppm TWA 150 ppm STEL	NIOSH REL: 100 ppm TWA 150 ppm STEL IDLH: 900 ppm FP: 81-90°F LEL: 0.9-1.1%	Inhalation, ingestion, skin absorption, skin or eye contact Aromatic odor	Irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal cell debris; anorexia, nausea, vomiting, abdominal pain; inflammation of skin	Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys Eye: Irrigate immediately Skin: Soap wash promptly Breathing: Respiratory support Swallow: Medical attention immediately	■ Impermeable, chemical-resistant, disposable clothing ■ Nitrile gloves If PEL is exceeded, min ½ Mask AP with OV cartridge	If potential for exposure exists: Initial personal air sampling Additional sampling if necessary based on initial results Verify method with laboratory prior to ordering media and equipment Real Time: 10.2 or 10.6 eV PID

NOTES:

The NIOSH Pocket Guide provides more information for the chemical in question or for a chemical not listed.

μg/m^3 = micrograms per cubic meter
AL = action limit
AP = air purifying respirator
APF = assigned protection factor
C = ceiling exposure limit
DOSH = Washington State Department of Labor and Industries, Division of Occupational Safety and Health (formerly the Washington Industrial Safety and Health Act)
eV = electron volt
°F = degrees Fahrenheit
FP = flash point
HEPA = high efficiency particulate air cartridge
IDLH = immediately dangerous to life and health
LEL = lower explosive limit
mg/m^3 = milligrams per cubic meter
min = minimum
N/A = not applicable
NIOSH = National Institute of Safety and Health
OSHA = Occupational Safety and Health Administration
OV = organic vapor cartridge
PEL = permissible exposure limit
PID = photoionization detector
PPE = personal protective equipment
ppm = parts per million
REL = recommended exposure limit
SA = supplied air respirator
STEL = short-term exposure limit, 15 minutes, unless otherwise noted
TPH = total petroleum hydrocarbon
TWA = time-weighted average

5.2 GENERAL SITE HAZARD ANALYSIS—PHYSICAL

This section addresses known and potential physical hazards specific to the Site. Reference 08-04, Physical Hazards Analysis, provides more information. Site documents provided by the client/owner/tenant can be helpful to identify Site specific hazards, such as non-SoundEarth HASPs, Traffic Control Plans, Operation and Maintenance Plans, and others documents.

5.2.1 General Site Specific Physical Hazards

Described below are physical hazards that may be encountered while on the Site:

- Compressed air
- Confined spaces
- Electrical hazards
- Ergonomic hazards
- Flammable liquids
- Heavy equipment/moving machinery
- Hot work
- Noise Exposure
- Overhead utilities and features
- Potentially flammable or explosive environment
- Pressurized injectate
- Slips, trips, and falls
- Temperature extremes
- Traffic and moving equipment
- Underground utilities and features
- Unsecure/uncontrolled site
- Unstable ground
- Hazardous processes
- Work at heights
- Work near water

5.2.2 Utility Hazards

Described below are utility hazards that may be present at the Site. In order to locate utilities, the Northwest Utility Notification Center should be called at (800) 424-5555, a private locate should be scheduled (as appropriate), side sewer cards should be reviewed, owner/tenant documents should be reviewed, and the Site should be visually inspected.

5.2.2.1 Underground Utilities (Reference 08-19, Underground Services Location and Protection)

Seven sanitary side sewer lines enter the Property from the west and connect to the 8-inch-diameter combined sewer line that runs beneath Boren Avenue North: two connect to the David Smith Building, one connects to the original Troy Building beneath the easement, one appears to be abandoned at the western Property boundary, and the remaining lines connect to the 1964-vintage addition of the Troy Building.

Three water mains enter the Property from the west and connect to the 8-inch-diameter cast iron water line that runs beneath Boren Avenue North.

The following subsurface utilities enter the Property from the north: a 6-inch-diameter natural gas line, an 8-inch-diameter combined sewer line, and an electrical conduit. Within the former alley, the gas line connects to both the Mokas and Troy buildings, and the combined sewer line connects to the Troy Building. The electrical line that enters from the north connects to the Mokas Building.

From the south, a telephone line enters the 1964-addition to the Troy Building.

From the east, a buried electrical line and water main enter the Property and connect to the Mokas Building, and two sanitary side sewer lines connect to the Troy Building from 8- and 12-inch-diameter combined sewer lines that run beneath Fairview Avenue North.

A buried electrical conduit is present along the northeastern exterior of the Troy Building.

Several generations of trench and vault networks remain inside the Troy Building and are associated with the former laundry and dry cleaning operations and heating systems. The existing features were compared to archived building plans for the Property. From east to west, the following subsurface features were observed (Figure B-2):

- A pit and trench system installed between 1946 and 1966.
- Brine and water pits associated with the water-softening equipment, installed between 1946 and 1966.
- A transformer vault and associated floor drains reportedly installed in 1964.
- Three vaults located in the central portion of the Property; their installation date is unknown.
- Zipper drains inside the north boiler room, installed after 1946.
- Floor drains in the center of the 1964-vintage garage addition.
- A zipper drain system within the northern portion of the 1964-vintage addition.
- A French drain at the base of the garage ramp, installed after 1964.

City of Seattle side sewer cards and building plans from the early 1940s to 1990s depicted the Property's former utility layout, which included the following:

- Product delivery and fill lines, which were associated with four former 2,000-gallon USTs, were present beneath the central portion of the Property.

- Storm and sanitary sewer lines were installed near the northern portion of the Troy Building and connected to combined sewer lines that were located within the center of the Property.
- Historical side sewer lines connected to the former sanitary sewer line located within the Harrison Avenue right-of-way (ROW) to the former residences in the northern portion of the Property.
- Side sewers associated with the former residences located on the southern portion of the Property connected to the combined sewer present beneath the Boren Avenue North ROW.

Although USTs were discovered in a ground-penetrating radar survey of the Property, additional USTs may exist throughout the Property. Contents of unknown USTs may include extremely volatile or flammable substances. Known USTs closed in place are presented on Figure B-2.

5.2.2.2 Overhead Utilities (Reference 08-10, Electrical Safety)

- Overhead telephone lines are present within the alley and connect to the three on-Property Buildings.
- Overhead power and telephone lines are present above the sidewalks that run north-south along Boren Avenue North and east-west along Harrison Street.
- Bus wires are present above the southern lane of Harrison Street.
- Guy poles are present in the north and south sidewalks of Harrison Street. Guy wires cross Harrison Street and connect to the poles.

6.0 TASK-RELATED SITE HAZARD ANALYSIS

This section outlines the health and safety hazards that may be present on the Site as a result of the tasks to be performed by SoundEarth or subcontractors as they relate to the chemical and physical hazards identified in Sections 5.1 and 5.2, above. References noted in Table 2 for the controls and any personal protective equipment (PPE) required should be reviewed. Reference identifications (08-01, Project Responsibilities through 08-23, Work Near Water) incorporated into Table 2 refer to the *HASP Reference Manual,* dated January 2011, which is a stand-alone document that compiles detailed information and instructions for protecting SoundEarth employees from chemical and physical hazards applicable to this HASP. A summary of the controls specific to the Site is presented in Section 7.0, Task-Related Site Hazard Controls Summary.

7.0 TASK-RELATED SITE HAZARD CONTROLS SUMMARY

The following controls are required for SoundEarth employees while performing work on the Site:

- Level D PPE, which includes hard hats, steel-toed boots, safety glasses, and a reflective safety vest
- Nitrile gloves
- Noise protection while drilling
- Lockout/tag-out procedures when disconnecting and cutting electrical lines

- Splash shield during injections
- Caution tape and traffic control in all parking areas and on streets

TABLE 2 SITE-SPECIFIC TASK-RELATED HAZARDS

Tasks	Role	Hazard	References
Sampling – Environmental	Task performed by SoundEarth	Chemicals	Table 1, Chemical Hazards 08-17, Sample Collection
		Confined space	08-09, Confined Space Awareness
		Emergency	08-02, Emergency Response Plan
		Heat stress/hypothermia	08-13, Temperature Extremes
		Ladders or heights	08-22, Work at Heights
		PPE, meetings, inspections	08-07, General Site Safety Requirements
		Process hazards	08-21, Work Around Hazardous Processes
		Traffic/mobile equipment	08-18, Traffic and Moving Equipment Hazards
		Unstable ground	08-20, Unstable Ground
Drilling and Subsurface Investigation	Subcontractor Oversight	Chemicals	Table 1, Chemical Hazards 08-06, Site-Specific Chemical Hazard Controls
		Emergency	08-02, Emergency Response Plan
		General site safety	08-07, General Site Safety Requirements
		Heat stress/hypothermia	08-13, Temperature Extremes
		Noise	08-15, Noise and Hearing Protection
		Overhead electric utilities	08-10, Electrical Safety
		Powered tools and equipment	08-10, Electrical Safety
		PPE, meetings, inspections	08-07, General Site Safety Requirements
		Unsecure/uncontrolled Site	08-08, Site Security and Overall Site Control

Tasks	Role	Hazard	References
		Traffic/mobile equipment	08-18, Traffic and Moving Equipment Hazards
		Underground utilities and features	08-19, Underground Services Location and Protection
		Unstable ground	08-20, Unstable Ground
UST Decommissioning	Subcontractor Oversight	Chemicals	08-06, Chemical Hazard Controls; 08-17, Sample Collection; Table 1, Chemical Hazards
		Confined spaces	08-09, Confined Space Awareness
		Cutting/welding	08-14, Hot Work Awareness
		Emergency Response	08-02, Emergency Response Plan
		Heat stress/hypothermia	08-13, Temperature Extremes
		Noise	08-15, Noise and Hearing Protection
		Overhead electrical utilities and features	08-10, Electrical Safety 08-16, Overhead Hazards
		Overhead electric utilities	08-10, Electrical Safety
		Powered tools and equipment	08-10, Electrical Safety
		General site hazards	08-07, General Site Safety Requirements
		Unsecure/uncontrolled Site	08-08, Site Security and Overall Site Control
		Traffic/mobile equipment	08-18, Traffic and Moving Equipment Hazards
		Underground utilities and features	08-19, Underground Services Location and Protection
		Unstable ground	08-20, Unstable Ground
Excavation and Trenching	Subcontractor Oversight	Chemicals	08-06, Chemical Hazard Controls; 08-17, Sample Collection; Table 1, Chemical Hazards
		Confined spaces	08-09, Confined Space Awareness
		Emergency Response	08-02, Emergency Response Plan

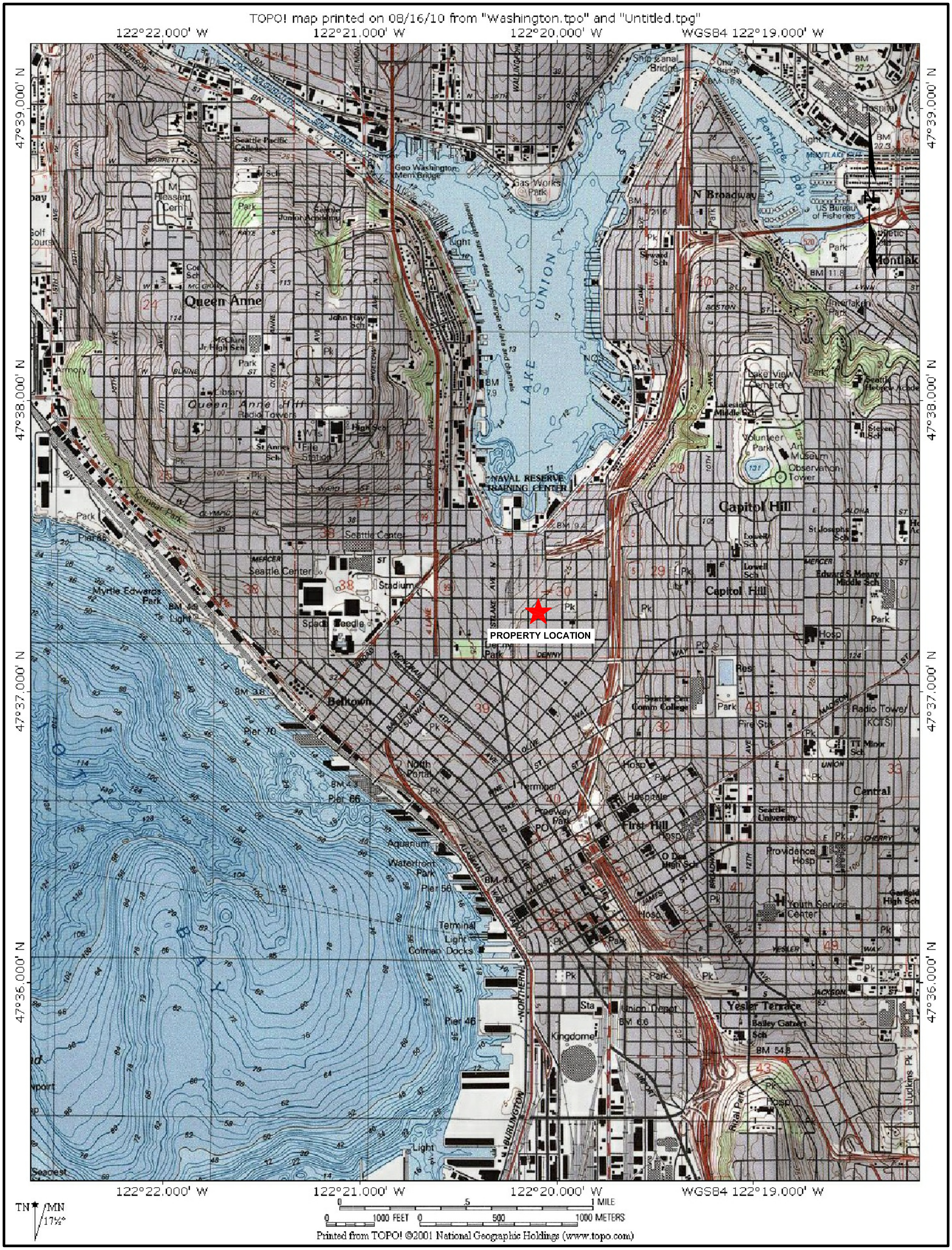
Tasks	Role	Hazard	References
…Excavation and Trenching continued		Heat stress/hypothermia	08-13, Temperature Extremes
		Noise	08-15, Noise and Hearing Protection
		Powered tools and equipment	08-10, Electrical Safety
		General site hazards	08-07, General Site Safety Requirements
		Unsecure/uncontrolled Site	08-08, Site Security and Overall Site Control
		Traffic/mobile equipment	08-18, Traffic and Moving Equipment Hazards
		Overhead electrical utilities and features	08-10, Electrical Safety 08-16, Overhead Hazards
		Underground utilities and features	08-19, Underground Services Location and Protection
		Unstable ground	08-20, Unstable Ground
Monitoring well decommissioning	Subcontractor Oversight	Chemicals	08-06, Site-Specific Chemical Hazard Controls; Table 1, Chemical Hazards
		Emergency Response	08-02, Emergency Response Plan
		General site safety	08-07, General Site Safety Requirements
		Heat stress/ hypothermia	08-13, Temperature Extremes
		Noise	08-15, Noise and Hearing Protection
		Overhead electrical utilities and features	08-10, Electrical Safety 08-16, Overhead Hazards
		Powered tools and equipment	08-10, Electrical Safety
		PPE, meetings, inspections	08-07, General Site Safety Requirements
		Unsecure/ uncontrolled Site	08-08, Site Security and Overall Site Control
		Traffic/mobile equipment	08-18, Traffic and Moving Equipment Hazards

Tasks	Role	Hazard	References
			08-19, Underground Services Location and Protection
		Underground utilities and features	
		Unstable ground	08-20, Unstable Ground
Remedial injection	Task performed by SoundEarth	Chemicals	08-06, Chemical Hazard Controls; Table 1, Chemical Hazards
		General site safety	08-07, General Site Safety Requirements
		Emergency	08-02, Emergency Response Plan
		Heat stress/hypothermia	08-13, Temperature Extremes
		Noise	08-015, Noise and Hearing Protection
		Overhead electric utilities	08-10, Electrical Safety
		Powered tools and equipment	08-10, Electrical Safety
		PPE, meetings, inspections	08-07, General Site Safety Requirements
		Pressurized Injectate	See Table 1, Chemical Hazards.
		Traffic/mobile equipment	08-18, Traffic and Moving Equipment Hazards
		Unsecure/uncontrolled Site	08-08, Site Security and Overall Site Control
		Unstable ground	08-20, Unstable Ground

FIGURES

P:\0731 TOUCHSTONE\0731-004 TROY LAUNDRY\TECHNICAL\CAD\FIGURE 1\0731-004-04_FIG 1_F.DWG

TOPO! map printed on 08/16/10 from "Washington.tpo" and "Untitled.tpg"



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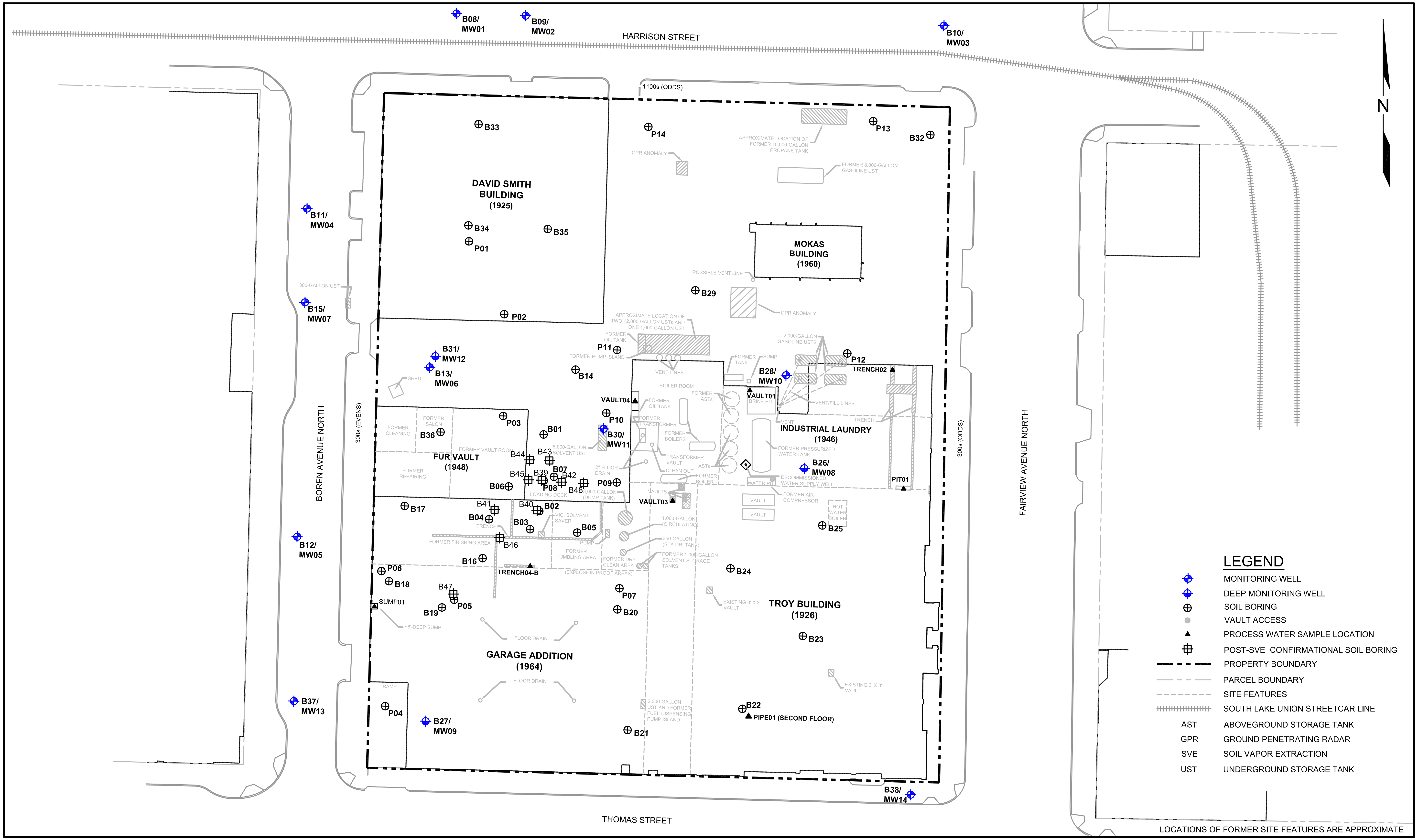
SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 06/06/2011
DRAWN BY: JQC
CHECKED BY: RMT
CAD FILE: 0731-004-04_FIG1

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004-04
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY, STATE: SEATTLE, WASHINGTON

FIGURE 1
PROPERTY
LOCATION MAP

SOUNDEARTHINC.COM



LEGEND

⊕	MONITORING WELL
⊕	DEEP MONITORING WELL
⊕	SOIL BORING
●	VAULT ACCESS
▲	PROCESS WATER SAMPLE LOCATION
⊞	POST-SVE CONFIRMATIONAL SOIL BORING
— · · —	PROPERTY BOUNDARY
— — —	PARCEL BOUNDARY
- - - -	SITE FEATURES
++++++++	SOUTH LAKE UNION STREETCAR LINE
AST	ABOVEGROUND STORAGE TANK
GPR	GROUND PENETRATING RADAR
SVE	SOIL VAPOR EXTRACTION
UST	UNDERGROUND STORAGE TANK

LOCATIONS OF FORMER SITE FEATURES ARE APPROXIMATE

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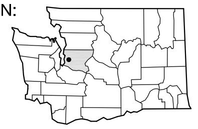
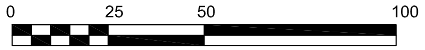
DATE: 12/05/11
DRAWN BY: NAC
CHECKED BY: EKR
CAD FILE: 0731-004_2011RI_EL

PROJECT NAME: TROY LAUNDRY PROPERTY
PROJECT NUMBER: 0731-004
STREET ADDRESS: 307 FAIRVIEW AVENUE NORTH
CITY,STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET

FIGURE B-2
PROPERTY PLAN

ATTACHMENT A

ACKNOWLEDGEMENT AND AGREEMENT FORM

SoundEarth Strategies

ACKNOWLEDGEMENT AND AGREEMENT FORM

I acknowledge that I have reviewed a copy of the Health and Safety Plan for this project, that I understand it, and that I agree to comply with all of its provisions. I also understand that I could be prohibited by the Site Manager/Health and Safety Officer or other SoundEarth personnel from working on this project if I fail to comply with any aspect of this Health and Safety Plan:

Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*
Name	*Signature*	*Company*	*Date*

ATTACHMENT B

DAILY HEALTH AND SAFETY BRIEFING LOG

SoundEarth Strategies

DAILY HEALTH AND SAFETY BRIEFING LOG

Date: ______________________ **Start Time:** ____________

Sites Discussed: ______________________

____

____

____

Subjects Discussed: ______________________

____

____

____

____

ATTENDEES

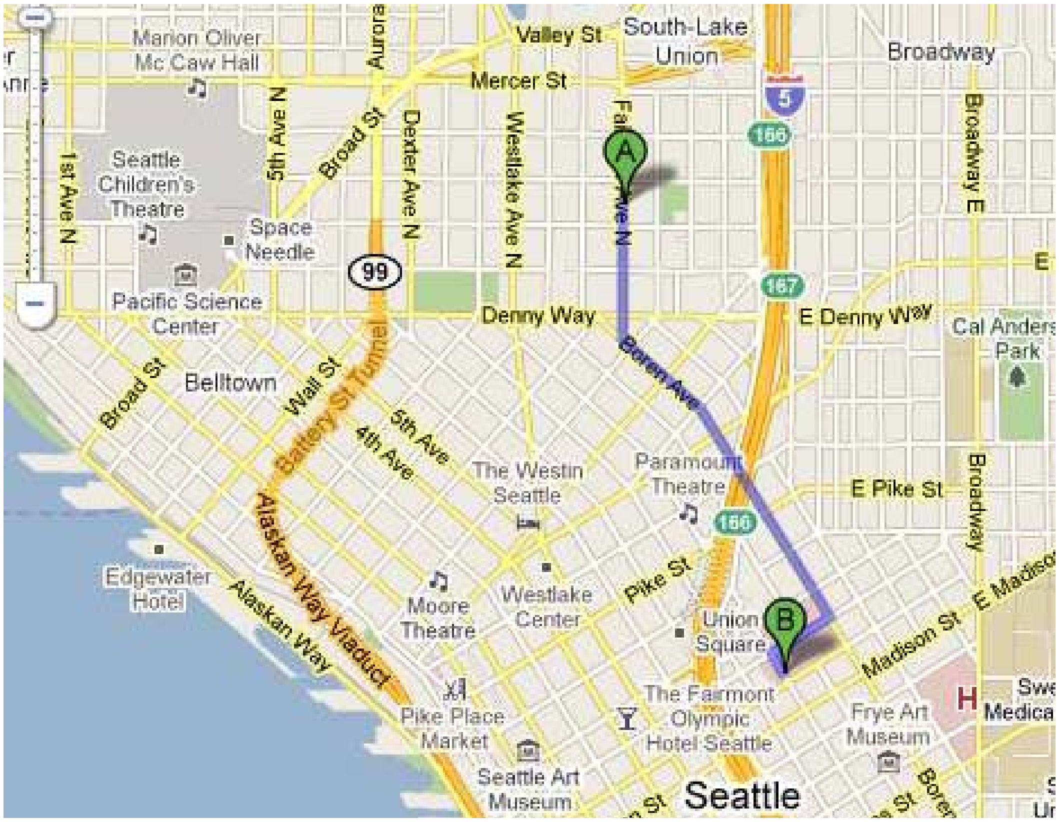
Print Name	**Signature**

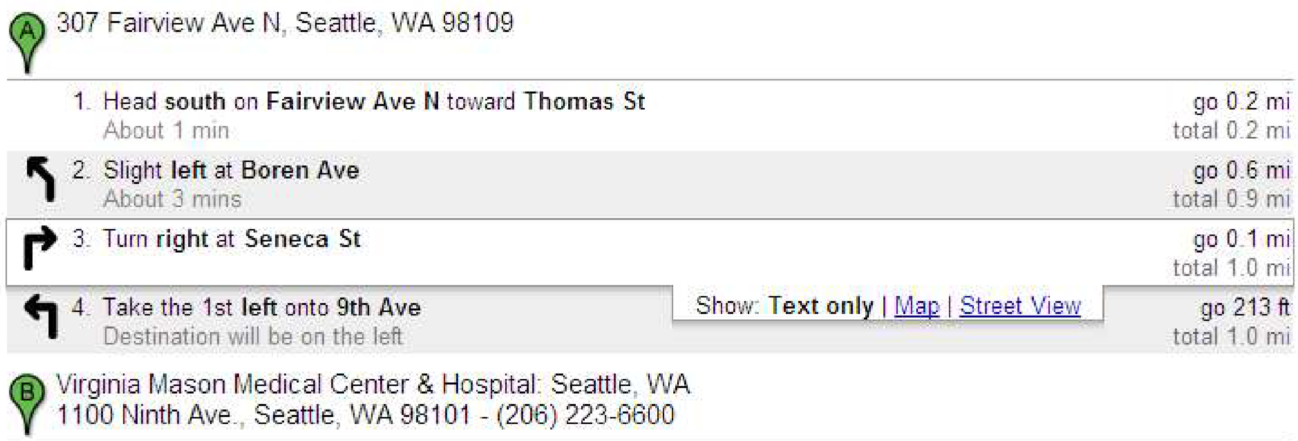
Meeting Conducted by ______________________ **Date Signed**____________

ATTACHMENT C

HOSPITAL ROUTES

Hospital Route



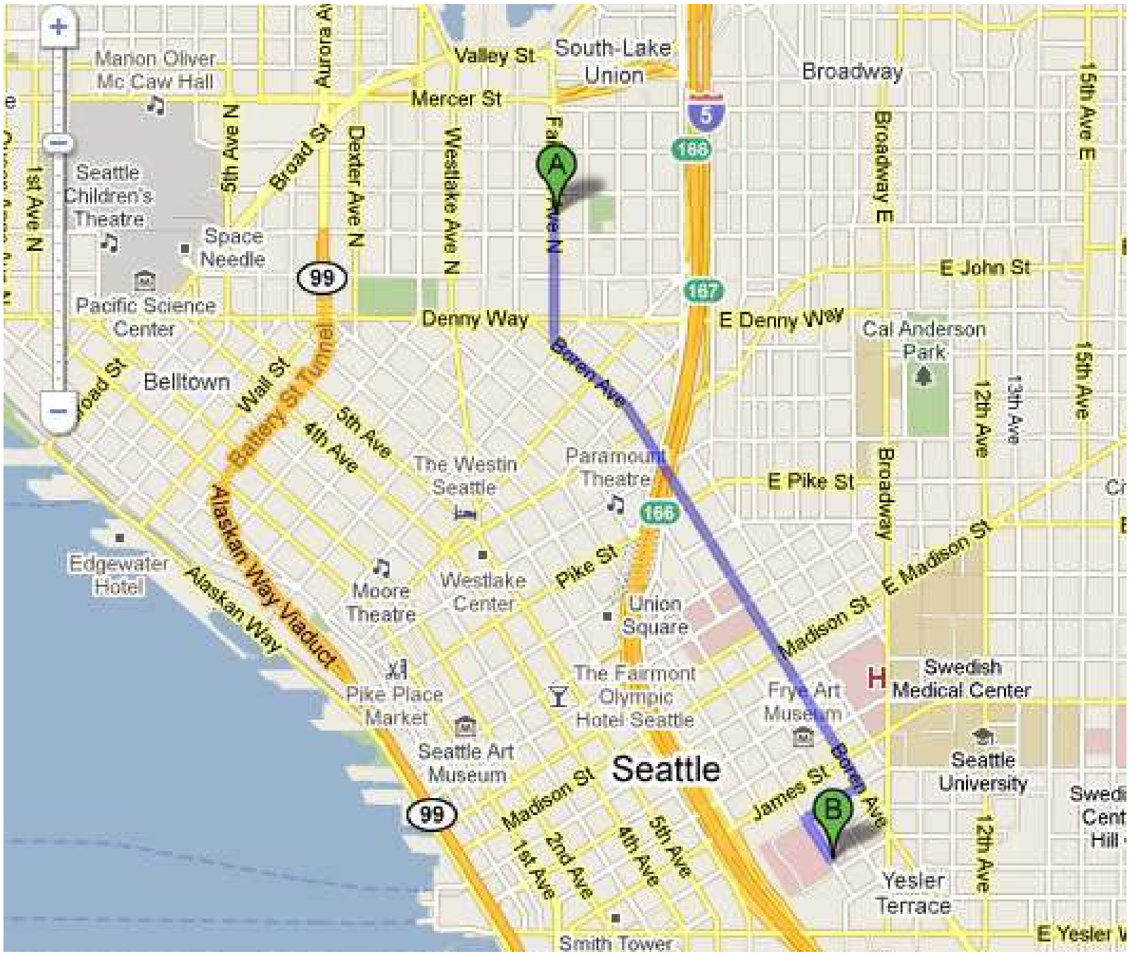


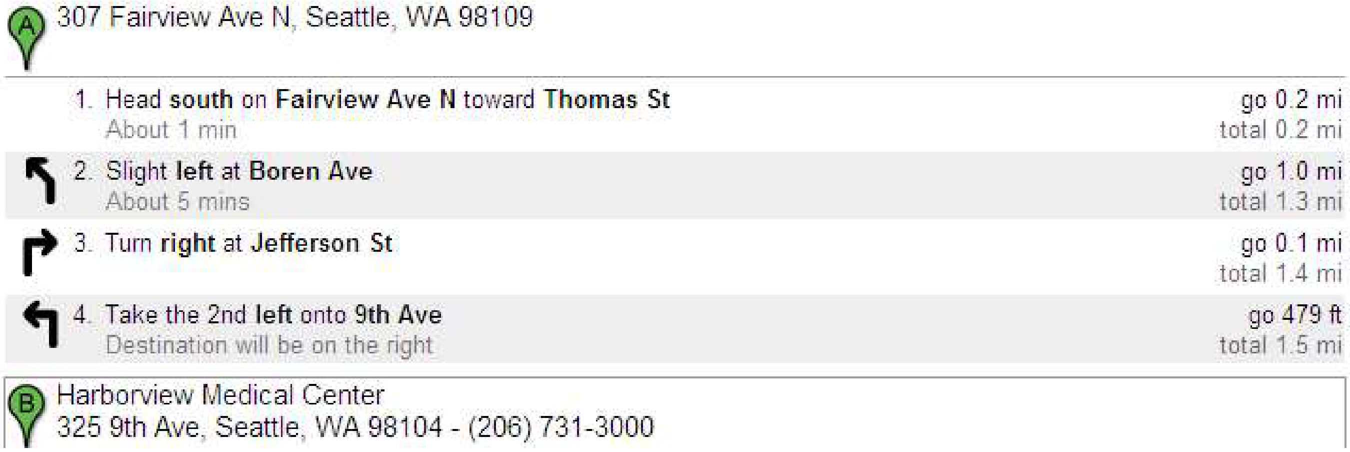
307 Fairview Ave N, Seattle, WA 98109

1. Head **south** on **Fairview Ave N** toward **Thomas St** — go 0.2 mi
About 1 min — total 0.2 mi
2. Slight **left** at **Boren Ave** — go 0.6 mi
About 3 mins — total 0.9 mi
3. Turn **right** at **Seneca St** — go 0.1 mi
total 1.0 mi
4. Take the 1st **left** onto **9th Ave** — go 213 ft
Destination will be on the left — total 1.0 mi

Virginia Mason Medical Center & Hospital: Seattle, WA
1100 Ninth Ave., Seattle, WA 98101 - (206) 223-6600

Alternate Hospital Route





A 307 Fairview Ave N, Seattle, WA 98109

1. Head **south** on **Fairview Ave N** toward **Thomas St** — go 0.2 mi, total 0.2 mi
   About 1 min
2. Slight **left** at **Boren Ave** — go 1.0 mi, total 1.3 mi
   About 5 mins
3. Turn **right** at **Jefferson St** — go 0.1 mi, total 1.4 mi
4. Take the 2nd **left** onto **9th Ave** — go 479 ft, total 1.5 mi
   Destination will be on the right

B Harborview Medical Center
325 9th Ave, Seattle, WA 98104 - (206) 731-3000

APPENDIX C
WASTE CHARACTERIZATION

Appendix C
Waste Characterization
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
P04	10/6/2010	2.5	90.55	93.05	0.0001
P05	10/6/2010	2.5	90.55	93.05	1.4
P06	10/6/2010	2.5	90.55	93.05	0.15
P07	10/6/2010	2.5	90.55	93.05	0.047
B21	9/30/2011	5	88.05	93.05	0.28
B22	10/3/2011	5	88.05	93.05	0.0001
B23	10/5/2011	5	88.05	93.05	0.0001
B24	10/5/2011	5	88.05	93.05	0.0001
B25	10/6/2011	5	88.05	93.05	0.0001
P04	10/6/2010	5	88.05	93.05	0.0001
P05	10/6/2010	5	88.05	93.05	2.5
P06	10/6/2010	5	88.05	93.05	0.68
P07	10/6/2010	5	88.05	93.05	0.13
B26/MW08	10/7/2011	5	87.88	92.88	0.0001
B28/MW10	10/10/2011	5	87.73	92.73	0.0001
P12	10/7/2010	5	87.26789	92.26789	0.0001
B16	9/26/2011	6	87.05	93.05	0.38
B17	9/27/2011	6	87.05	93.05	0.046
B02	12/8/2010	7	86.05	93.05	2.3
P04	10/6/2010	7.5	85.55	93.05	0.0001
P05	10/6/2010	7.5	85.55	93.05	0.073
P07	10/6/2010	7.5	85.55	93.05	0.055
B40	1/16/2012	7	85.3579	92.3579	0.0017
P10	10/7/2010	2.5	85.2803	87.7803	0.13
B04	12/8/2010	8	85.05	93.05	2
P06	10/6/2010	8	85.05	93.05	0.44
B02	12/8/2010	9	84.05	93.05	2.3
P09	10/7/2010	5	83.92304	88.92304	0.098
B42	1/16/2012	3	83.52172	86.52172	0.053
B41	1/16/2012	7	83.49711	90.49711	0.18
B05	12/8/2010	10	83.05	93.05	0.057
B21	9/30/2011	10	83.05	93.05	0.0001
B22	10/3/2011	10	83.05	93.05	0.0001
B23	10/5/2011	10	83.05	93.05	0.0001
B24	10/5/2011	10	83.05	93.05	0.0001
B25	10/6/2011	10	83.05	93.05	0.0001
P04	10/6/2010	10	83.05	93.05	0.0001
P05	10/6/2010	10	83.05	93.05	0.087
B26/MW08	10/7/2011	10	82.88	92.88	0.0001
P08	10/7/2010	3	82.8215	85.8215	63
B28/MW10	10/10/2011	10	82.73	92.73	0.0001
B39	1/16/2012	3	82.67603	85.67603	5.1
P12	10/7/2010	10	82.26789	92.26789	0.0001
P13	10/7/2010	2.5	82.11304	84.61304	0.0001
B16	9/26/2011	11	82.05	93.05	0.0001
B17	9/27/2011	11	82.05	93.05	0.053

Appendix C
Waste Characterization
Troy Laundry Property
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Seattle, Washington

Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
P06	10/6/2010	11	82.05	93.05	0.028
P07	10/6/2010	11	82.05	93.05	0.16
B43	1/16/2012	3	81.61259	84.61259	0.22
P09	10/7/2010	7.5	81.42304	88.92304	0.0001
B45	1/16/2012	3	81.38474	84.38474	7.7
B40	1/16/2012	11	81.3579	92.3579	0.0013
P08	10/7/2010	5	80.8215	85.8215	0.46
B44	1/16/2012	3	80.30316	83.30316	1.7
P10	10/7/2010	7.5	80.2803	87.7803	0.066
P11	10/7/2010	2.5	80.22992	82.72992	0.0001
B05	12/8/2010	13	80.05	93.05	0.34
P04	10/6/2010	13	80.05	93.05	0.0001
B10/MW03	5/24/2011	5	79.65	84.65	0.0001
B42	1/16/2012	7	79.52172	86.52172	0.028
B41	1/16/2012	11	79.49711	90.49711	0.13
B04	12/8/2010	14	79.05	93.05	0.69
P06	10/6/2010	14	79.05	93.05	0.063
B39	1/16/2012	7	78.67603	85.67603	0.088
P08	10/7/2010	7.5	78.3215	85.8215	450
B20	9/29/2011	15	78.05	93.05	0.22
B21	9/30/2011	15	78.05	93.05	0.0001
B22	10/3/2011	15	78.05	93.05	0.0001
B23	10/5/2011	15	78.05	93.05	0.0001
B24	10/5/2011	15	78.05	93.05	0.0001
P05	10/6/2010	15	78.05	93.05	0.082
B26/MW08	10/7/2011	15	77.88	92.88	0.0001
B28/MW10	10/10/2011	15	77.73	92.73	0.0001
B43	1/16/2012	7	77.61259	84.61259	0.015
B45	1/16/2012	7	77.38474	84.38474	11
B14	5/26/2011	4	77.31295	81.31295	0.0001
P12	10/7/2010	15	77.26789	92.26789	0.0001
P13	10/7/2010	7.5	77.11304	84.61304	0.0001
B02	12/8/2010	16	77.05	93.05	0.5
B16	9/26/2011	16	77.05	93.05	0.051
B17	9/27/2011	16	77.05	93.05	0.14
P09	10/7/2010	12	76.92304	88.92304	0.076
B44	1/16/2012	7	76.30316	83.30316	5.6
P04	10/6/2010	17	76.05	93.05	0.029
P08	10/7/2010	10	75.8215	85.8215	250
B37/MW13	10/18/2011	15	75.66	90.66	0.0001
B01	12/8/2010	6	75.34854	81.34854	0.22
P11	10/7/2010	7.5	75.22992	82.72992	0.039
B04	12/8/2010	18	75.05	93.05	0.47
B05	12/8/2010	18	75.05	93.05	0.42
B16	9/26/2011	18	75.05	93.05	0.0001
B39	1/16/2012	11	74.67603	85.67603	0.049

Appendix C
Waste Characterization
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B10/MW03	5/24/2011	10	74.65	84.65	0.0001
P13	10/7/2010	10	74.61304	84.61304	0.0001
B12/MW05	5/25/2011	10	74.04	84.04	0.0001
P09	10/7/2010	15	73.92304	88.92304	0.089
P10	10/7/2010	14	73.7803	87.7803	0.038
B45	1/16/2012	11	73.38474	84.38474	6.4
B01	12/8/2010	8	73.34854	81.34854	0.2
B30/MW11	10/11/2011	15	73.23	88.23	0.0001
B20	9/30/2011	20	73.05	93.05	0.0001
B21	10/4/2011	20	73.05	93.05	0.0001
B22	10/3/2011	20	73.05	93.05	0.0001
B23	10/5/2011	20	73.05	93.05	0.0001
B24	10/5/2011	20	73.05	93.05	0.0001
B25	10/6/2011	20	73.05	93.05	0.0001
P04	10/6/2010	20	73.05	93.05	0.0001
P05	10/6/2010	20	73.05	93.05	0.14
P06	10/6/2010	20	73.05	93.05	0.099
B27/MW09	10/11/2011	20	72.92	92.92	0.0001
B26/MW08	10/7/2011	20	72.88	92.88	0.0001
B28/MW10	10/10/2011	20	72.73	92.73	0.0001
B14	5/26/2011	9	72.31295	81.31295	0.0001
B44	1/16/2012	11	72.30316	83.30316	0.057
B17	9/27/2011	21	72.05	93.05	0.0001
P02	10/6/2010	2	71.93	73.93	0.039
P08	10/7/2010	14	71.8215	85.8215	1.3
P11	10/7/2010	11	71.72992	82.72992	0.0001
P14	10/7/2010	2.5	71.6706	74.1706	0.0001
B37/MW13	10/18/2011	20	70.66	90.66	0.0001
B13/MW06	5/25/2011	4.5	70.28	74.78	0.0001
B30/MW11	10/11/2011	18	70.23	88.23	0.026
P10	10/7/2010	18	69.7803	87.7803	0.069
B10/MW03	5/24/2011	15	69.65	84.65	0.0001
B16	9/26/2011	23.5	69.55	93.05	0.18
B45	1/16/2012	15	69.38474	84.38474	0.078
B12/MW05	5/25/2011	15	69.04	84.04	0.0001
B06	12/8/2010	5	68.93	73.93	0.87
B33	10/13/2011	5	68.93	73.93	0.0001
B35	10/14/2011	5	68.93	73.93	0.0001
B36	10/17/2011	5	68.93	73.93	0.0001
B36	10/17/2011	5	68.93	73.93	0.0001
P01	10/6/2010	5	68.93	73.93	0.0001
P02	10/6/2010	5	68.93	73.93	0.042
P03	10/6/2010	5	68.93	73.93	0.13
P11	10/7/2010	14	68.72992	82.72992	0.0001
B29	10/10/2011	15	68.53891	83.53891	0.0001
B44	1/16/2012	15	68.30316	83.30316	0.045

Appendix C
Waste Characterization
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B30/MW11	10/11/2011	20	68.23	88.23	0.0001
B16	9/26/2011	25	68.05	93.05	0.085
B18	9/28/2011	25	68.05	93.05	0.12
B19	9/29/2011	25	68.05	93.05	0.11
B20	9/30/2011	25	68.05	93.05	0.0001
B21	10/4/2011	25	68.05	93.05	0.0001
B22	10/3/2011	25	68.05	93.05	0.0001
B23	10/5/2011	25	68.05	93.05	0.0001
B24	10/5/2011	25	68.05	93.05	0.0001
B25	10/6/2011	25	68.05	93.05	0.0001
B27/MW09	10/11/2011	25	67.92	92.92	0.0001
B26/MW08	10/7/2011	25	67.88	92.88	0.0001
P08	10/7/2010	18	67.8215	85.8215	1.6
B28/MW10	10/10/2011	25	67.73	92.73	0.0001
B14	5/26/2011	14	67.31295	81.31295	0.0001
B17	9/27/2011	26	67.05	93.05	0.03
B30/MW11	10/11/2011	21.5	66.73	88.23	0.0001
P13	10/7/2010	18	66.61304	84.61304	0.0001
P14	10/7/2010	7.6	66.5706	74.1706	0.0001
P01	10/6/2010	7.5	66.43	73.93	0.0001
P02	10/6/2010	7.5	66.43	73.93	0.025
B06	12/8/2010	8	65.93	73.93	0.53
P10	10/7/2010	22	65.7803	87.7803	0.03
B13/MW06	5/25/2011	9	65.78	74.78	0.0001
B11/MW04	5/25/2011	5	65.69	70.69	0.0001
B37/MW13	10/18/2011	25	65.66	90.66	0.0001
P03	10/6/2010	9	64.93	73.93	0.099
P11	10/7/2010	18	64.72992	82.72992	0.1
B10/MW03	5/24/2011	20	64.65	84.65	0.0001
B12/MW05	5/25/2011	20	64.04	84.04	0.0001
B06	12/8/2010	10	63.93	73.93	0.43
B33	10/13/2011	10	63.93	73.93	0.0001
B35	10/14/2011	10	63.93	73.93	0.0001
B36	10/17/2011	10	63.93	73.93	0.0001
P01	10/6/2010	10	63.93	73.93	0.0001
P02	10/6/2010	10	63.93	73.93	0.035
B09/MW02	5/20/2011	7	63.92	70.92	0.0001
B08/MW01	5/19/2011	5	63.68	68.68	0.0001
B29	10/10/2011	20	63.53891	83.53891	0.0001
B07	12/8/2010	23	63.47833	86.47833	0.58
B01	12/8/2010	18	63.34854	81.34854	0.86
B16	9/26/2011	30	63.05	93.05	0.028
B17	9/27/2011	30	63.05	93.05	0.0001
B18	9/28/2011	30	63.05	93.05	0.059
B19	9/29/2011	30	63.05	93.05	0.0001
B20	9/30/2011	30	63.05	93.05	0.0001

Appendix C
Waste Characterization
Troy Laundry Property
307 Fairview Avenue North
Seattle, Washington

Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B21	10/4/2011	30	63.05	93.05	0.0001
B22	10/3/2011	30	63.05	93.05	0.0001
B23	10/5/2011	30	63.05	93.05	0.0001
B24	10/5/2011	30	63.05	93.05	0.0001
B25	10/6/2011	30	63.05	93.05	0.0001
B27/MW09	10/11/2011	30	62.92	92.92	0.0001
B26/MW08	10/7/2011	30	62.88	92.88	0.0001
P08	10/7/2010	23	62.8215	85.8215	1.6
B14	5/26/2011	19	62.31295	81.31295	0.0001
P03	10/6/2010	12.5	61.43	73.93	0.076
B09/MW02	5/20/2011	10	60.92	70.92	0.0001
B13/MW06	5/25/2011	14	60.78	74.78	0.0001
B11/MW04	5/25/2011	10	60.69	70.69	0.0001
B37/MW13	10/18/2011	30	60.66	90.66	0.0001
P14	10/7/2010	14	60.1706	74.1706	0.0001
P01	10/6/2010	14	59.93	73.93	0.0001
B10/MW03	5/24/2011	25	59.65	84.65	0.0001
B29	10/10/2011	24	59.53891	83.53891	0.0001
B12/MW05	5/25/2011	25	59.04	84.04	0.0001
B33	10/13/2011	15	58.93	73.93	0.0001
B35	10/14/2011	15	58.93	73.93	0.0001
B36	10/17/2011	15	58.93	73.93	0.028
B08/MW01	5/19/2011	10	58.68	68.68	0.0001
B16	9/26/2011	35	58.05	93.05	0.0001
B17	9/27/2011	35	58.05	93.05	0.03
B18	9/28/2011	35	58.05	93.05	0.054
B19	9/29/2011	35	58.05	93.05	0.0001
B20	9/30/2011	35	58.05	93.05	0.0001
B21	10/4/2011	35	58.05	93.05	0.0001
B22	10/3/2011	35	58.05	93.05	0.0001
B23	10/5/2011	35	58.05	93.05	0.0001
B24	10/5/2011	35	58.05	93.05	0.0001
B25	10/6/2011	35	58.05	93.05	0.0001
P03	10/6/2010	16	57.93	73.93	0.057
B27/MW09	10/11/2011	35	57.92	92.92	0.0001
B26/MW08	10/7/2011	35	57.88	92.88	0.0001
B14	5/26/2011	23.5	57.81295	81.31295	0.0001
B28/MW10	10/10/2011	35	57.73	92.73	0.0001
B09/MW02	5/20/2011	15	55.92	70.92	0.0001
B13/MW06	5/25/2011	19	55.78	74.78	0.0001
B11/MW04	5/25/2011	15	55.69	70.69	0.0001
B37/MW13	10/18/2011	35	55.66	90.66	0.0001
P01	10/6/2010	18.5	55.43	73.93	0.026
P03	10/6/2010	19	54.93	73.93	0.08
B10/MW03	5/24/2011	30	54.65	84.65	0.0001
P14	10/7/2010	20	54.1706	74.1706	0.0001

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Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B12/MW05	5/25/2011	30	54.04	84.04	0.0001
B33	10/13/2011	20	53.93	73.93	0.0001
B35	10/14/2011	20	53.93	73.93	0.0001
P01	10/6/2010	20	53.93	73.93	0.028
B08/MW01	5/19/2011	15	53.68	68.68	0.0001
B29	10/10/2011	30	53.53891	83.53891	0.0001
B30/MW11	10/11/2011	35	53.23	88.23	0.0001
B16	9/26/2011	40	53.05	93.05	0.0001
B17	9/27/2011	40	53.05	93.05	0.076
B18	9/28/2011	40	53.05	93.05	0.11
B19	9/29/2011	40	53.05	93.05	0.0001
B20	9/30/2011	40	53.05	93.05	0.0001
B21	10/4/2011	40	53.05	93.05	0.0001
B22	10/3/2011	40	53.05	93.05	0.0001
B23	10/5/2011	40	53.05	93.05	0.0001
B24	10/5/2011	40	53.05	93.05	0.0001
B25	10/6/2011	40	53.05	93.05	0.0001
B27/MW09	10/11/2011	40	52.92	92.92	0.0001
B26/MW08	10/7/2011	40	52.88	92.88	0.0001
B28/MW10	10/10/2011	40	52.73	92.73	0.0001
B07	12/8/2010	35	51.47833	86.47833	1.7
B14	5/26/2011	30	51.31295	81.31295	0.23
B09/MW02	5/20/2011	20	50.92	70.92	0.0001
B13/MW06	5/25/2011	24	50.78	74.78	0.069
B11/MW04	5/25/2011	20	50.69	70.69	0.0001
B37/MW13	10/18/2011	40	50.66	90.66	0.0001
B10/MW03	5/24/2011	35	49.65	84.65	0.0001
B07	12/8/2010	37	49.47833	86.47833	0.16
B12/MW05	5/25/2011	35	49.04	84.04	0.0001
B33	10/13/2011	25	48.93	73.93	0.0001
B34	10/14/2011	25	48.93	73.93	0.0001
B35	10/14/2011	25	48.93	73.93	0.0001
B08/MW01	5/19/2011	20	48.68	68.68	0.0001
B29	10/10/2011	35	48.53891	83.53891	0.0001
B30/MW11	10/11/2011	40	48.23	88.23	0.0001
B16	9/26/2011	45	48.05	93.05	0.046
B17	9/27/2011	45	48.05	93.05	0.082
B18	9/28/2011	45	48.05	93.05	0.072
B19	9/29/2011	45	48.05	93.05	0.0001
B20	9/30/2011	45	48.05	93.05	0.0001
B21	10/4/2011	45	48.05	93.05	0.0001
B22	10/3/2011	45	48.05	93.05	0.0001
B23	10/5/2011	45	48.05	93.05	0.0001
B24	10/5/2011	45	48.05	93.05	0.0001
B25	10/6/2011	45	48.05	93.05	0.0001
B27/MW09	10/11/2011	45	47.92	92.92	0.0001

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Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B26/MW08	10/7/2011	45	47.88	92.88	0.0001
B14	5/26/2011	33.5	47.81295	81.31295	0.0001
B28/MW10	10/10/2011	45	47.73	92.73	0.0001
B09/MW02	5/20/2011	25	45.92	70.92	0.0001
B13/MW06	5/25/2011	29	45.78	74.78	0.039
B11/MW04	5/25/2011	25	45.69	70.69	0.0001
B37/MW13	10/18/2011	45	45.66	90.66	0.0001
B14	5/26/2011	36	45.31295	81.31295	0.0001
B10/MW03	5/24/2011	40	44.65	84.65	0.0001
B15/MW07	5/26/2011	30	44.55	74.55	0.0001
B33	10/13/2011	30	43.93	73.93	0.0001
B34	10/14/2011	30	43.93	73.93	0.0001
B35	10/14/2011	30	43.93	73.93	0.0001
B36	10/17/2011	30	43.93	73.93	0.039
B08/MW01	5/19/2011	25	43.68	68.68	0.0001
B29	10/10/2011	40	43.53891	83.53891	0.0001
B30/MW11	10/11/2011	45	43.23	88.23	0.0001
B16	9/26/2011	50	43.05	93.05	0.18
B17	9/27/2011	50	43.05	93.05	0.042
B18	9/28/2011	50	43.05	93.05	0.12
B19	9/29/2011	50	43.05	93.05	0.0001
B20	9/30/2011	50	43.05	93.05	0.0001
B21	10/4/2011	50	43.05	93.05	0.0001
B22	10/3/2011	50	43.05	93.05	0.0001
B23	10/5/2011	50	43.05	93.05	0.0001
B24	10/5/2011	50	43.05	93.05	0.0001
B25	10/6/2011	50	43.05	93.05	0.0001
B27/MW09	10/11/2011	50	42.92	92.92	0.0001
B26/MW08	10/7/2011	50	42.88	92.88	0.0001
B28/MW10	10/10/2011	50	42.73	92.73	0.0001
B09/MW02	5/20/2011	30	40.92	70.92	0.0001
B13/MW06	5/25/2011	34	40.78	74.78	0.0001
B11/MW04	5/25/2011	30	40.69	70.69	0.0001
B37/MW13	10/18/2011	50	40.66	90.66	0.0001
B14	5/26/2011	41	40.31295	81.31295	0.0001
B10/MW03	5/24/2011	45	39.65	84.65	0.0001
B15/MW07	5/26/2011	35	39.55	74.55	0.0001
B12/MW05	5/25/2011	45	39.04	84.04	0.0001
B33	10/13/2011	35	38.93	73.93	0.0001
B34	10/14/2011	35	38.93	73.93	0.0001
B35	10/14/2011	35	38.93	73.93	0.0001
B36	10/17/2011	35	38.93	73.93	0.0001
B08/MW01	5/19/2011	30	38.68	68.68	0.0001
B29	10/10/2011	45	38.53891	83.53891	0.0001
B30/MW11	10/11/2011	50	38.23	88.23	0.0001
B16	9/26/2011	55	38.05	93.05	0.0001

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Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE^1 (mg/kg)
B17	9/27/2011	55	38.05	93.05	0.047
B18	9/28/2011	55	38.05	93.05	0.11
B19	9/29/2011	55	38.05	93.05	0.0001
B20	9/30/2011	55	38.05	93.05	0.0001
B21	10/4/2011	55	38.05	93.05	0.0001
B22	10/3/2011	55	38.05	93.05	0.0001
B23	10/5/2011	55	38.05	93.05	0.0001
B24	10/6/2011	55	38.05	93.05	0.0001
B25	10/6/2011	55	38.05	93.05	0.0001
B27/MW09	10/11/2011	55	37.92	92.92	0.0001
B26/MW08	10/7/2011	55	37.88	92.88	0.0001
B28/MW10	10/10/2011	55	37.73	92.73	0.0001
B09/MW02	5/20/2011	35	35.92	70.92	0.0001
B13/MW06	5/25/2011	39	35.78	74.78	0.0001
B11/MW04	5/25/2011	35	35.69	70.69	0.0001
B37/MW13	10/18/2011	55	35.66	90.66	0.0001
B14	5/27/2011	46	35.31295	81.31295	0.0001
B10/MW03	5/24/2011	50	34.65	84.65	0.0001
B15/MW07	5/26/2011	40	34.55	74.55	0.0001
B33	10/13/2011	40	33.93	73.93	0.0001
B34	10/14/2011	40	33.93	73.93	0.0001
B35	10/14/2011	40	33.93	73.93	0.0001
B36	10/17/2011	40	33.93	73.93	0.099
B08/MW01	5/19/2011	35	33.68	68.68	0.0001
B29	10/10/2011	50	33.53891	83.53891	0.0001
B30/MW11	10/11/2011	55	33.23	88.23	0.0001
B17	9/27/2011	60	33.05	93.05	0.062
B18	9/28/2011	60	33.05	93.05	0.12
B19	9/29/2011	60	33.05	93.05	0.0001
B20	9/30/2011	60	33.05	93.05	0.0001
B21	10/4/2011	60	33.05	93.05	0.0001
B22	10/3/2011	60	33.05	93.05	0.0001
B23	10/5/2011	60	33.05	93.05	0.0001
B24	10/6/2011	60	33.05	93.05	0.0001
B25	10/6/2011	60	33.05	93.05	0.0001
B27/MW09	10/11/2011	60	32.92	92.92	0.0001
B26/MW08	10/7/2011	60	32.88	92.88	0.0001
B28/MW10	10/10/2011	60	32.73	92.73	0.0001
B09/MW02	5/20/2011	40	30.92	70.92	0.0001
B13/MW06	5/25/2011	44	30.78	74.78	0.037
B11/MW04	5/25/2011	40	30.69	70.69	0.0001
B37/MW13	10/18/2011	60	30.66	90.66	0.0001
B14	5/27/2011	51	30.31295	81.31295	0.0001
B10/MW03	5/24/2011	55	29.65	84.65	0.0001
B15/MW07	5/26/2011	45	29.55	74.55	0.0001
B12/MW05	5/25/2011	55	29.04	84.04	0.044

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Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B33	10/13/2011	45	28.93	73.93	0.0001
B34	10/14/2011	45	28.93	73.93	0.0001
B35	10/14/2011	45	28.93	73.93	0.0001
B36	10/17/2011	45	28.93	73.93	0.0001
B08/MW01	5/19/2011	40	28.68	68.68	0.0001
B29	10/10/2011	55	28.53891	83.53891	0.0001
B30/MW11	10/11/2011	60	28.23	88.23	0.0001
B16	9/27/2011	65	28.05	93.05	0.0001
B17	9/27/2011	65	28.05	93.05	0.067
B18	9/28/2011	65	28.05	93.05	0.11
B19	9/29/2011	65	28.05	93.05	0.0001
B20	9/30/2011	65	28.05	93.05	0.0001
B21	10/4/2011	65	28.05	93.05	0.0001
B22	10/3/2011	65	28.05	93.05	0.0001
B23	10/5/2011	65	28.05	93.05	0.0001
B24	10/6/2011	65	28.05	93.05	0.0001
B25	10/6/2011	65	28.05	93.05	0.0001
B27/MW09	10/11/2011	65	27.92	92.92	0.0001
B28/MW10	10/10/2011	65	27.73	92.73	0.0001
B09/MW02	5/20/2011	45	25.92	70.92	0.0001
B13/MW06	5/25/2011	49	25.78	74.78	0.07
B11/MW04	5/25/2011	45	25.69	70.69	0.0001
B37/MW13	10/18/2011	65	25.66	90.66	0.0001
B14	5/27/2011	56	25.31295	81.31295	0.0001
B10/MW03	5/24/2011	60	24.65	84.65	0.0001
B15/MW07	5/26/2011	50	24.55	74.55	0.0001
B12/MW05	5/25/2011	60	24.04	84.04	0.057
B33	10/13/2011	50	23.93	73.93	0.0001
B34	10/14/2011	50	23.93	73.93	0.029
B35	10/14/2011	50	23.93	73.93	0.0001
B36	10/17/2011	50	23.93	73.93	0.0001
B08/MW01	5/19/2011	45	23.68	68.68	0.0001
B29	10/10/2011	60	23.53891	83.53891	0.0001
B14	5/27/2011	58	23.31295	81.31295	0.13
B30/MW11	10/11/2011	65	23.23	88.23	0.0001
B16	9/27/2011	70	23.05	93.05	0.043
B17	9/27/2011	70	23.05	93.05	0.0001
B18	9/28/2011	70	23.05	93.05	0.027
B19	9/29/2011	70	23.05	93.05	0.0001
B20	9/30/2011	70	23.05	93.05	0.0001
B21	10/4/2011	70	23.05	93.05	0.0001
B22	10/3/2011	70	23.05	93.05	0.0001
B23	10/5/2011	70	23.05	93.05	0.0001
B24	10/6/2011	70	23.05	93.05	0.0001
B25	10/6/2011	70	23.05	93.05	0.0001
B27/MW09	10/11/2011	70	22.92	92.92	0.0001

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Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B26/MW08	10/7/2011	70	22.88	92.88	0.0001
B28/MW10	10/10/2011	70	22.73	92.73	0.0001
B09/MW02	5/20/2011	50	20.92	70.92	0.0001
B13/MW06	5/25/2011	54	20.78	74.78	0.0001
B11/MW04	5/25/2011	50	20.69	70.69	0.0001
B37/MW13	10/18/2011	70	20.66	90.66	0.0001
B14	5/27/2011	61	20.31295	81.31295	0.0001
B13/MW06	5/26/2011	55	19.78	74.78	0.0001
B10/MW03	5/24/2011	65	19.65	84.65	0.0001
B33	10/13/2011	55	18.93	73.93	0.0001
B34	10/14/2011	55	18.93	73.93	0.0001
B35	10/14/2011	55	18.93	73.93	0.0001
B36	10/17/2011	55	18.93	73.93	0.0001
B08/MW01	5/19/2011	50	18.68	68.68	0.0001
B29	10/10/2011	65	18.53891	83.53891	0.0001
B30/MW11	10/11/2011	70	18.23	88.23	0.0001
B17	9/27/2011	75	18.05	93.05	0.0001
B27/MW09	10/11/2011	75	17.92	92.92	0.0001
B28/MW10	10/10/2011	75	17.73	92.73	0.0001
B13/MW06	5/26/2011	58	16.78	74.78	0.0001
B14	5/27/2011	65	16.31295	81.31295	0.0001
B09/MW02	5/20/2011	55	15.92	70.92	0.0001
B11/MW04	5/25/2011	55	15.69	70.69	0.0001
B37/MW13	10/18/2011	75	15.66	90.66	0.0001
B15/MW07	5/26/2011	60	14.55	74.55	0.0001
B12/MW05	5/26/2011	70	14.04	84.04	0.035
B33	10/13/2011	60	13.93	73.93	0.0001
B34	10/14/2011	60	13.93	73.93	0.0001
B35	10/14/2011	60	13.93	73.93	0.0001
B36	10/17/2011	60	13.93	73.93	0.0001
B08/MW01	5/19/2011	55	13.68	68.68	0.0001
B29	10/10/2011	70	13.53891	83.53891	0.0001
B30/MW11	10/11/2011	75	13.23	88.23	0.0001
B17	9/27/2011	80	13.05	93.05	0.0001
B27/MW09	10/11/2011	80	12.92	92.92	0.0001
B26/MW08	10/7/2011	80	12.88	92.88	0.0001
B28/MW10	10/10/2011	80	12.73	92.73	0.0001
B14	5/27/2011	69	12.31295	81.31295	0.0001
B09/MW02	5/20/2011	60	10.92	70.92	0.0001
B13/MW06	5/26/2011	64	10.78	74.78	0.0001
B11/MW04	5/25/2011	60	10.69	70.69	0.0001
B37/MW13	10/18/2011	80	10.66	90.66	0.0001
B10/MW03	5/24/2011	75	9.65	84.65	0.0001
B15/MW07	5/26/2011	65	9.55	74.55	0.0001
B38/MW14	10/19/2011	95	9.4	104.4	0.0001
B12/MW05	5/26/2011	75	9.04	84.04	0.0001

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Boring ID	Date	Sample Depth (feet)	Sample Elevation (feet NAVD88)	Ground Surface Elevation (feet NAVD88)	PCE[1] (mg/kg)
B33	10/13/2011	65	8.93	73.93	0.0001
B34	10/14/2011	65	8.93	73.93	0.0001
B35	10/14/2011	65	8.93	73.93	0.0001
B36	10/17/2011	65	8.93	73.93	0.0001
B08/MW01	5/19/2011	60	8.68	68.68	0.0001
B30/MW11	10/11/2011	80	8.23	88.23	0.0001
B28/MW10	10/10/2011	85	7.73	92.73	0.0001
B14	5/27/2011	75	6.31295	81.31295	0.0001
B09/MW02	5/20/2011	65	5.92	70.92	0.0001
B13/MW06	5/26/2011	69	5.78	74.78	0.0001
B11/MW04	5/25/2011	65	5.69	70.69	0.0001
B37/MW13	10/18/2011	85	5.66	90.66	0.0001
B10/MW03	5/24/2011	80	4.65	84.65	0.0001
B15/MW07	5/26/2011	70	4.55	74.55	0.0001
B38/MW14	10/19/2011	100	4.4	104.4	0.0001
B12/MW05	5/26/2011	80	4.04	84.04	0.0001
B36	10/17/2011	70	3.93	73.93	0.0001
B27/MW09	10/12/2011	90	2.92	92.92	0.0001
B26/MW08	10/10/2011	90	2.88	92.88	0.0001
B28/MW10	10/10/2011	90	2.73	92.73	0.0001
B09/MW02	5/20/2011	70	0.92	70.92	0.0001
B13/MW06	5/26/2011	74	0.78	74.78	0.0001
B38/MW14	10/19/2011	105	-0.6	104.4	0.0001
B31/MW12	10/13/2011	80	-5.56	74.44	0.0001
B27/MW09	10/12/2011	100	-7.08	92.92	0.0001
B26/MW08	10/10/2011	100	-7.12	92.88	0.0001
B31/MW12	10/13/2011	85	-10.56	74.44	0.0001
B31/MW12	10/13/2011	90	-15.56	74.44	0.0001
B27/MW09	10/12/2011	110	-17.08	92.92	0.0001
B26/MW08	10/10/2011	110	-17.12	92.88	0.0001
B31/MW12	10/13/2011	95	-20.56	74.44	0.0001
B31/MW12	10/13/2011	100	-25.56	74.44	0.0001

NOTES:

[1] For color definitions of PCE in soil, refer to Figures 23A through 23J of the Draft Cleanup Action Plan, which were generated based on this data.

mg/kg = milligrams per kilogram

PCE = tetrachloroethylene