Final Remedial Investigation Report, Feasibility Study, and Proposed Cleanup Action

sound environmental strategies corporation

Property:

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Prepared for:

Bridge Group II, LLC
9032 42nd Avenue Northeast
Seattle, Washington
and
Block at Ballard II, LLC
801 Grand Avenue
Des Moines, Iowa

January 19, 2010

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Report prepared for:

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Former Wesmar Property
1401 & 1451 Northwest 46th Street
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0398-002-03

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ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
µg/L	micrograms per liter, equivalent to parts per billion
ARARs	applicable or relevant and appropriate requirements
ASARCO	American Smelting and Refining Company
bgs	below ground surface
BINMIC	Ballard Interbay Northend Manufacturing and Industrial Center
BNSF	Burlington Northern Santa Fe
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	chemical of concern
Colortech	Colortech®, Inc.
cPAH	carcinogenic PAH
DO	dissolved oxygen
DPD	Seattle Department of Planning and Development
DRPH	diesel-range petroleum hydrocarbons
Ecology	Washington State Department of Ecology
EPA	United States Environmental Protection Agency
Floyd Snyder McCarthy	The Floyd Snyder McCarthy Group
FS	Feasibility Study
gpm	gallons per minute
GRPH	gasoline-range petroleum hydrocarbons
HSA	hollow-stem auger
IDW	investigative-derived waste
mg/kg	milligrams per kilogram, equivalent to parts per million
MSL	mean sea level
MTCA	Model Toxics Control Act
MUPs	Master Use Permits
NAVD 1988	National Vertical Datum established in 1988
NTU	nephelometric turbidity units
ODEQ	State of Oregon Department of Environmental Quality
ORPH	oil-range petroleum hydrocarbons
PAH	polycyclic aromatic hydrocarbon
PCA	Proposed Cleanup Action
PCB	polychlorinated biphenyl
PCP	pentachlorophenol
the Property	1401 & 1451 Northwest 46th Street in Seattle, Washington
PSD	public storm drain

ACRONYMS AND ABBREVIATIONS (CONTINUED)

PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
RBC	risk-based concentration
RCW	Revised Code of Washington
RI	Remedial Investigation
RIWP	Remedial Investigation Work Plan
ROW	right-of-way
SAP	Sampling and Analysis Plan
SCM	Site Conceptual Model
SES	Sound Environmental Strategies Corporation
the Site	the extent of PAH-contaminated soil both on and off of the Property associated with the historical use of the Property as a wood pipe treatment facility; the off-Property extent of PAH contamination identified in soil borings B47, B54, and B55; arsenic-contaminated soil beneath the Property; arsenic-contaminated groundwater beneath the Property, limited to Area A
TEF	toxicity equivalency factor
TSDF	treatment, storage, or disposal facility
UCL_{95}	95th percent upper confidence limit on the mean
USC	United States Code
USCS	Unified Soil Classification System
VGT	Vashon Glacial Till
VOC	volatile organic compound
VRO	Vashon Recession Outwash
WAC	Washington Administrative Code
Wesmar	Wesmar Company, Inc.

EXECUTIVE SUMMARY

Sound Environmental Strategies Corporation has prepared this Final Remedial Investigation Report, Feasibility Study, and Proposed Cleanup Action for the former Wesmar Company Inc. Property located at 1401 & 1451 Northwest 46th Street in Seattle, Washington (herein referred to as the Property), on behalf of Bridge Group II, LLC and Block at Ballard II, LLC. The Remedial Investigation was conducted in general accordance with the Model Toxics Control Act promulgated in Chapter 173-340-350 of the Washington Administrative Code and pursuant to the Washington State Department of Ecology Agreed Order No. DE 3812 that became effective in January 2008.

The Property is currently vacant. Wesmar Company, Inc., a chemical distributor specializing in cleaners, sanitizers, and water treatment compounds, was the most recent occupant of the western portion of the Property. In addition, the eastern portion of the Property was recently occupied by Colortech®, Inc., a company that provided coating services for metals and metal-formed products. The Property currently is occupied by two single-story, slab-on-grade buildings that were constructed in 1905 and 1957, respectively. Prior to the most recent tenants, the Property operated as a pipe-treatment facility that utilized creosote. The floor grade of the buildings lies approximately 8 to 10 feet below the surrounding street grade, and a wastewater sump is located on the southern portion of the former Wesmar Company, Inc. building.

The Property is scheduled to undergo redevelopment to a multi-story, mixed-use commercial/retail complex. Redevelopment plans include construction of a subsurface parking lot to an approximate depth of 20 feet below the surrounding street surface grade.

The results of preliminary subsurface investigations conducted on the Property indicate that polycyclic aromatic hydrocarbon-contaminated soil and arsenic-contaminated soil and groundwater are present beneath the Property. Sound Environmental Strategies Corporation conducted the latest phase of the remedial investigation on the Property and within the adjacent rights-of-way in November and December 2007, and in April, June, and August 2008 in accordance with the Remedial Investigation Work Plan, Former Wesmar Property, 1401 & 1451 Northwest 46th Street, Seattle, Washington, dated November 21, 2007, and the Supplemental Remedial Investigation Work Plan, Former Wesmar Property, 1401 & 1451 Northwest 46th Street, Seattle, Washington, dated May 22, 2008, prepared by Sound Environmental Strategies Corporation. The results of work conducted on the Property are summarized herein.

In January 2008, Bridge Group II, LLC entered into an Agreed Order with the Washington State Department of Ecology. The Agreed Order required that Bridge Group II, LLC complete a Remedial Investigation and Feasibility Study of the Property, which were used to draft the Proposed Cleanup Action Plan, included herein. On January 27, 2009, Block at Ballard II, LLC purchased the Property from Bridge Group II, LLC and is currently in the process of finalizing a Consent Decree with the Washington State Department of Ecology. This report describes the scope of work completed by Sound Environmental Strategies Corporation in the course of the remedial investigation, along with our findings and conclusions.

Specific data gaps that were addressed during this remedial investigation include the current environmental quality of the soil and groundwater beneath the Colortech®, Inc. building; the extent of polycyclic aromatic hydrocarbon contamination in soil to the north, east, and south of

EXECUTIVE SUMMARY (CONTINUED)

the Property; the magnitude of arsenic-laden slag railroad ballast; and a potential source for the arsenic-contaminated groundwater.

Field activities undertaken during this remedial investigation included:

- The collection of 10 railroad ballast samples;
- The advancement of 31 push-probe soil borings to evaluate the extent of soil contamination beneath and adjacent to the Property; and
- The advancement of five hollow-stem auger borings completed as monitoring wells to evaluate the extent of soil and groundwater contamination beneath and adjacent to the Property.

Soil and groundwater samples were collected from the borings and monitoring wells and submitted to the laboratory for analysis of polycyclic aromatic hydrocarbons and metals. Polycyclic aromatic hydrocarbon soil contamination resulting from the former use of the Property as a wooden pipe treatment and storage facility generally appears to be limited to the Property and a portion of the Northwest 46th Street right-of-way. Soil in the vicinity of the former wood treatment operations contains elevated concentrations of carcinogenic polycyclic aromatic hydrocarbons. Concentrations of benzo(a)pyrene that exceeded the Model Toxics Control Act Method A cleanup level generally were observed at depths between 2.5 and 11.5 feet below ground surface and were confined to the fill layer beneath the Property and a portion of the Northwest 46th Street right-of-way. The equivalent carcinogenic polycyclic aromatic hydrocarbon exceedances at each location were correlative with the detection of benzo(a)pyrene. Groundwater was not impacted by carcinogenic polycyclic aromatic hydrocarbons.

Concentrations of arsenic detected in soil samples collected from within the rights-of-way and along the former Burlington Northern-Santa Fe railroad are likely a result of regional impacts and do not appear to be associated with activities conducted on the Property. Concentrations of arsenic exceeded the Model Toxics Control Act Method A cleanup level in soil on the eastern portion of the Property and along the northern Property boundary, although soil concentrations generally exceeded the Model Toxics Control Act Method A Cleanup Level by less than 5 milligrams per kilogram. Two soil samples collected from the southern Property boundary also contained elevated arsenic concentrations.

Concentrations of arsenic in soil and groundwater collected from the North Ballard Interbay Northend Manufacturing and Industrial Center area commonly exceed the Model Toxics Control Act Method A cleanup level. This is likely a result of the fill materials beneath the Property and vicinity and the ballast used in the construction of the railroads. Three of the ballast samples contained the highest arsenic concentrations relative to other soil samples collected from the Property and surrounding off-Property areas. In addition, arsenic is a common compound used in herbicides and is regularly used along roads and railways in an effort to reduce the growth of weeds.

Based on the findings from the investigations conducted by Sound Environmental Strategies Corporation between September 2005 and August 2008 and the historical research presented in this report, the Site has been defined to include the following criteria:

EXECUTIVE SUMMARY (CONTINUED)

- Extent of polycyclic aromatic hydrocarbon-contaminated soil both on and off of the Property associated with the historical use of the Property as a wood pipe treatment facility. The off-Property extent of polycyclic aromatic hydrocarbon contamination identified in soil borings B47, B54, and B55 are included in the Site definition.
- Arsenic-contaminated soil beneath the Property.
- Arsenic-contaminated groundwater beneath the Property. Washington State Department of Ecology has determined that the groundwater contamination associated with the historical use of the Property is limited to Area A, identified in Figure 11.

Based on the location of the Property within the Ballard Interbay Northend Manufacturing and Industrial Center area, the heavy railroad use in the rights-of-way adjacent to the Property, and the absence of historical uses on Property that would have contributed to the local and regional arsenic soil and groundwater contamination, the following criteria should be excluded from the Site definition.

- Arsenic in soil beyond the Property boundary.
- Arsenic in groundwater beyond the Property boundary.

Using the Site definition described above, a feasibility study was conducted to develop and evaluate cleanup action alternatives that would facilitate selection of a final cleanup action at the Property in accordance with Chapter 173-340-350(8) through 173-340-370 of the Washington Administrative Code. Based on the results of the feasibility study, Cleanup Alternatives 1a, 2b, and 2c, which entail installing an impermeable shoring wall, excavating polycyclic aromatic hydrocarbon- and arsenic-contaminated soil from within the proposed redevelopment footprint, capping contaminated soil beyond the boundaries of the proposed shoring system, and monitoring the discharge of arsenic-contaminated water within the building subgrade water intrusion control system. A cleanup action plan was prepared in accordance with Chapter 173-340-380. The cleanup action plan was based on the results of the feasibility study and presents the methods proposed to remediate the contaminated soil and groundwater beneath the Site.

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, investigative methods, and investigation results is contained within this report.

1.0 INTRODUCTION

Sound Environmental Strategies Corporation (SES) has prepared this Final Remedial Investigation Report, Feasibility Study, and Proposed Cleanup Action (RI/FS and PCA) for the former Wesmar Company, Inc. (Wesmar) Property located at 1401 & 1451 Northwest 46th Street in Seattle, Washington (herein referred to as the Property) on behalf of Bridge Group II, LLC and Block at Ballard II, LLC. On January 27, 2009, Block at Ballard II, LLC purchased the Property from Bridge Group II, LLC (herein referred to as Agreed Order Signatory). This RI/FS and PCA was prepared for submittal to the Washington State Department of Ecology (Ecology), and it was developed to meet the general requirements of a remedial investigation as defined in the Model Toxics Control Act (MTCA), Chapter 70.105D of the Revised Code of Washington (RCW), as implemented by the MTCA Cleanup Regulation, Chapter 173-340 of the Washington Administrative Code (WAC). This RI/FS and PCA has been prepared in accordance with Ecology's formal cleanup administrative mechanism; it is submitted in conformance with the Ecology Agreed Order No. DE 3812 between the Agreed Order Signatory and Ecology and to accompany the Consent Decree between Block at Ballard II LLC and Ecology.

The results of preliminary subsurface investigations conducted on the Property indicated that polycyclic aromatic hydrocarbon (PAH)-contaminated soil and arsenic-contaminated soil and groundwater are present beneath the Property and in the adjacent rights-of-way (ROWs) to the east and south of the Property. SES conducted the latest phase of the RI on the Property and within the adjacent ROWs in November and December 2007 and in April, June, and August 2008 in accordance with the *Remedial Investigation Work Plan, Former Wesmar Property, 1401 & 1451 Northwest 46th Street, Seattle, Washington* dated November 21, 2007 (RIWP) and the *Supplemental Remedial Investigation Work Plan, Former Wesmar Property, 1401 & 1451 Northwest 46th Street, Seattle, Washington*, dated May 22, 2008 (SES 2007g). The results of work conducted on the Property are summarized herein.

1.1 DOCUMENT PURPOSE AND OBJECTIVES

The purpose of this RI/FS and PCA is to present historical information regarding the former use of the Property and surrounding parcels, summarize the information obtained during the review of historical information and during previous subsurface investigations conducted on the Property, present the findings of the Remedial Investigation (RI) conducted in November and December 2007 and in April, June, and August 2008. In addition, this report describes the Site Conceptual Model (SCM) and presents the results of the Feasibility Study (FS) conducted for the Property in order to enable the most appropriate remedial technologies to be evaluated and to allow redevelopment of the Property to a more beneficial land use, as described in the Proposed Cleanup Action (PCA).

To accomplish this purpose, SES assembled and reviewed the readily available information for the Property. This report includes:

- A summary of the land use history of the Property and vicinity;
- A summary of the geology and hydrogeology of the Property and vicinity;
- A summary of previous investigations conducted on the Property;
- A description of the activities conducted as part of the RI and a summary of the findings;
- A description of the SCM that identifies source areas, defines the nature and extent of contamination, and evaluates mechanisms that preferentially support chemical migration;
- Figures and tables illustrating the contaminant distribution beneath the Property and vicinity;

- Evaluation of several remedial methods and technologies to identify the most feasible remedial alternatives to clean up the Property consistent with MTCA; and
- Details for the implementation of the selected remedial alternatives in the PCA.

2.0 BACKGROUND

The following section provides a summary of current and historical land use on the Property and the vicinity.

2.1 PROPERTY LOCATION AND DESCRIPTION

The following subsections present the current land use practices on the Property and surrounding parcels.

2.1.1 Subject Property

The Property includes a single tax parcel (King County parcel number 276830-3245) that covers approximately 102,132 square feet (2.34 acres) of land. The Property is listed as 1401 & 1451 Northwest 46th Street and is located approximately 5 miles northwest of downtown Seattle, Washington (Figure 1).

Wesmar, a chemical distributor specializing in cleaners, sanitizers, and water treatment compounds, was the most recent occupant of the western portion of the Property. In addition, the eastern portion of the Property was recently occupied by Colortech®, Inc. (Colortech), a company that provided coating services for metals and metal-formed products. The Property currently is occupied by two vacant, single-story, slab-on-grade buildings that were constructed in 1906 and 1957, respectively. The floor grade of the buildings lies approximately 8 to 10 feet below the surrounding street grade.

A wastewater sump is located on the southern portion of the former Wesmar building. The wastewater sump is tied into the on-Property stormwater system and eventually ties in to the 96-inch-diameter combined sewer main located within 14th Avenue Northwest (Figure 2). The wastewater sump did not appear to be frequently used as part of the Wesmar operations.

The Property is scheduled to undergo redevelopment to a multi-story, mixed-use commercial/retail complex. Redevelopment plans involve construction of a subsurface parking lot to an approximate depth of 20 feet below the surrounding street surface grade.

The Property is located within the Ballard Interbay Northend Manufacturing and Industrial Center (BINMIC) area, an approximately 971-acre area incorporating waterfront and uplands northwest of downtown Seattle (Photographs 1 through 15). The BINMIC area is well known as a region with significant environmental issues as a result of the various historical industrial operations that were conducted in the area. The BINMIC boundaries are designated by Northwest Market Street and Northwest Leary Way in Ballard to the north; Third Avenue Northwest and Third Avenue West to the east; the Chittenden Locks and Magnolia to the west; and Dravus Street to the south. The Property is located within the North BINMIC area, which is zoned general industrial or industrial buffer and includes such maritime businesses as commercial fishing, ship repair and boatyards, metal fabricators, print shops, warehousing, and storage. In the vicinity of the Property, retail stores, office buildings, service providers, and commercial properties are prominent tenants. In addition to industrial applications, several single-family homes and apartment buildings are located near the northern boundary of the North BINMIC area.

2.1.2 Adjoining Properties

Development on and in the vicinity of the Property is primarily industrial. Uses of nearby parcels at the time this report was prepared are summarized below.

- **North.** Northwest 46th Street, a City of Seattle ROW, bounds the Property to the north. General Disposal formerly occupied the land beyond Northwest 46th Street; the parcels have recently been redeveloped and are occupied by a commercial office building and retail stores (BBI Property).
- **South.** Northwest 45th Street, a City of Seattle ROW, provides the southern Property boundary, along which runs an active rail line. The Rolls Royce Naval Marine and the Seattle Community College Maritime Training Center occupy the parcels across Northwest 45th Street.
- **East.** The eastern Property boundary is provided by 14th Avenue Northwest, a City of Seattle ROW. Bowman Refrigeration and warehouses occupy the land across 14th Avenue Northwest.
- **West.** The Property is bounded to the west by 15th Avenue Northwest, a City of Seattle ROW. The Lake Union Boat Repair lies to the west of the Property across 15th Avenue Northwest; that parcel was formerly occupied by a bulk storage tank facility used to store organic oils associated with the Lyle E. Branchflower fat extraction plant.

2.1.3 Adjoining Utilities

A 96-inch-diameter sewer main and a 54-inch-diameter sewer main are located beneath the 14th Avenue Northwest and the Northwest 45th Street ROWs, respectively (Figure 2). The top of the sewer main within 14th Avenue Northwest is located approximately 16 feet below ground surface (bgs), and the top of the sewer main within Northwest 45th Street is located approximately 5 feet bgs.

A natural gas line, which is approximately 36 inches bgs, runs along Northwest 46th Street, approximately 20 feet north of the Property boundary. A sanitary sewer line, which is located approximately 10 feet north of the gas line, is approximately 9.75 feet bgs and runs along the center line of the Northwest 46th Street ROW. A water line, which is located approximately 10 feet north of the sanitary sewer line along the north side of Northwest 46th Street, is approximately 4 feet bgs.

The utilities surrounding the Property are presented in plan view and as a cross section in Figure 2.

2.2 PROPERTY LAND USE HISTORY

The Property lies approximately 175 feet north of the Lake Washington Ship Canal. The Property has been used for heavy industrial operations since the early 1900s (Photographs 1 through 3). Historical activities include the use of the Property as a wooden pipe manufacturing facility, cannery, plastic products manufacturing facility, and a chemical product manufacturer/distributor (Wesmar). A more detailed description of historical Property use is provided in Sections 2.2.1 and 2.2.2.

2.2.1 Washington State Archives

Washington State Archives records were reviewed as part of the RI in order to provide an evaluation of historical land use practices on and surrounding the Property.

The Former Wesmar Property

In 1902, a stove-heated, single-family residence was constructed on the western portion of the Property. By 1906, the Continental Pipe Manufacturing Co. factory (Photograph 1; Appendix A) and the City Electric Light and Water Works operated on the Property. The building was remodeled in 1937, and an addition to the factory was constructed in 1946, at which time the facility was operated by the Durabilt Luggage Co. (Photograph 2). In 1957, the Pacific Plastics Co. (Photograph 3) constructed a factory equipped with two 4,000-gallon underground storage tanks on the easternmost portion of the Property (Appendix A). The City of Seattle purchased the 1902-vintage single-family residence in 1957, and in 1958, the structure was demolished. According to archived records, a second addition was constructed on the western portion of the luggage company in 1958. This addition likely was constructed over the footprint of the former single-family residence.

Surrounding Parcels

A description of records on file regarding the parcels adjacent to the subject Property follows, and a summary of the findings is presented in Figure 3 and Table 1.

- **North.** Archived records indicated that several factories constructed between 1937 and 1960 operated on the parcels directly north of the Property. The factories were owned and operated by Olympian Stone Company, General Disposal Company, and Northwest Wool Co. A power station, paint manufacturing facility, automobile repair facility, the Ballard Bridge Auto Wrecking Co., and Joe's Iron and Metal operated farther to the north across Northwest Ballard Way. Magnolia Milling Company, a fertilizer producer, operated across Northwest Ballard Way to the north-northeast of the Property.
- **South.** The Pacific Fishing and Trading Co. occupies the parcels across Northwest 45th Street to the south of the Property. The Wayland Mill Co., Seattle Cedar Manufacturing Co., and Ballard Manufacturing Co./J.W. McDonnell Shingle Mill and Lumber Mill (Photographs 4 through 7) operated on the parcels across Shilshole Avenue Northwest to the southwest from 1906 through at least the 1960s. The Commercial Marine Construction Co. and Pioneer Sand and Gravel occupied the parcel to the southeast of the Property across Northwest 45th Street.
- **East.** The Northwest Bolt and Nut Co. (Photograph 8), which was equipped with several warehouses and factories constructed between 1928 and 1942, operated on the parcels across 14th Avenue Northwest to the east of the Property. A Burlington Northern Santa Fe (BNSF) rail line runs along the eastern boundary of the Northwest Bolt and Nut Co., and Seattle Boiler Works occupied the parcel to the east of the rail line. The North Coast Tanning Co. and the Superior Biscuit Co. operated to the northeast of the Property across Northwest 46th Street.
- **West.** A 1906-vintage store and 1946-vintage storage facility operated on the parcel across 15th Avenue Northwest, and several single-family residences constructed between 1891 and 1902 occupied the parcels west of the store and northwest of the Property. As discussed above, the Wayland Mill Co. and the Seattle Cedar Manufacturing Co. (Photographs 10 and 11) operated on the parcels across Shilshole Avenue Northwest.

2.2.2 Historical Maps

The following is a summary of our observations of the information provided in historical maps, including Sanborn Fire Insurance maps dated 1905, 1917, 1950, and 1968 (Figures 4 and 5, Table 1, and Appendix B); historical topographic maps dated 1894, 1897, and 1908 (Appendix C); City of Seattle sewer maps dated 1903 and 1913 (Appendix C); and a Bird's Eye View map of the City of Seattle published in 1891(Appendix C).

- **1891 through 1903.** Several maps included in our review indicated that the shoreline of Salmon Bay was located along the southern Property boundary and covered the southeastern corner of the Property, which would suggest that the original elevations of portions of the Property were approximately 0 to 5.5 feet above mean sea level (MSL), or 10.0 to 15.5 feet above MSL according to NAVD88.

In addition, the maps for this period indicate the presence of an electric street car line that ran along the eastern Property boundary in the 1890s and early 1900s. Further review suggested that an electric street car ran along Northwest 47th Street, or one block north of the Property (Appendix C). However, evidence of the former roadway was apparent in borings B47, B54, and B55 at 11.5 feet bgs, at which depth a 6-inch to 1-foot thick layer of silt exhibiting a moderate creosote odor was observed.

- **1903 through 1913.** A sewer map prepared by the City of Seattle in 1903 indicated the presence of both the previous shoreline (pre-1903) and the existing parcels. It is apparent that the Property and vicinity was regraded in order to bring the surface elevation above the water level of Salmon Bay (Figure 2). By 1905, the former Wesmar building had been constructed on the 1903-vintage grade, which is the existing on-Property grade beneath the building slab. At that time, the Property, streets, and the parcel to the south were located on a similar elevation, and operations on the Property and the parcel to the south appeared interrelated (Figure 4). In addition, the 1905-vintage dip tank was visible on the central portion of the Property. Because the dip tank did not appear to be located belowground, it would have been at an elevation of approximately 22 feet above MSL (NAVD88).
- **1913 through Present.** According to records on file at the Seattle Department of Planning and Development (DPD), additional regrading of the Property and vicinity occurred in 1913, at which time the streets were brought to their existing grade (Figure 2). Approximately 9 feet of fill was deposited to raise the grade of Northwest 45th Street and Northwest 46th Street, as well as the side streets, above the floor slab grade of the 1905-vintage building on the Property.

The Pacific Coast Pipe Company's wooden pipe factory operated on the central and western portions of the Property; the eastern portion was occupied by the City of Seattle Pipe Storage Yard (Figure 5). The pipe company was equipped with a creosote dip tank, dry kiln, two underground storage tanks containing heating oil, and mobile chemical storage carts. Single-family residences occupied the parcel across Northwest 46th Street to the northwest, a paint shop operated directly north, and the West Coast Iron Works occupied the parcel across Northwest 46th Street to the northeast. Single-family residences occupied the parcel to the west across 15th Avenue Northwest, and Ballard Drop Forge Co. operated on the parcel across 14th Avenue Northwest to the east. A railroad ran along Northwest 45th Street, and the land directly across Northwest 45th Street appeared vacant. Phoenix Shingle Company's cedar shingle mill operated on the parcel located to the south of Shilshole Avenue Northwest.

- **1950.** The Property was occupied by R.D. Bodle Fruit and Vegetable Cannery and was heated by a steam furnace, the fuel for which was provided by heating oil. The land formerly occupied by the City of Seattle was vacant. A concrete products factory operated on the parcel to the north of the subject Property and was equipped with lime and cement storage, manufacturing, drying, and curing facilities. Single-family residences were located adjacent to the west of the concrete factory, and a cabinet shop was located adjacent to the east. An office occupied the parcel across Northwest 45th Street to the southeast of the Property, and Phoenix Shingle Company remained across Shilshole Avenue Northwest. Across 14th Avenue Northwest was the Northwest Bolt and Nut Company, which was equipped with bolt bending and dipping facilities. An organic oil bulk storage facility occupied the parcel across 15th Avenue Northwest.
- **1968.** The Property was occupied by a shoe warehouse, fiberglass product manufacturing facility, and the Union Paper Box manufacturing company. The structures to the north of the Property were primarily vacant, although a boiler house, single-family residence, truck repair facility, and a restaurant appeared to be in operation. An organic oil storage/bulk fuel facility was located across 15th Avenue Northwest to the west of the Property, and a research lab and welding facility was located to the south. No information was available regarding operations on the parcel across 14th Avenue Northwest to the east.

2.2.3 Chain of Title

In 1889, the ROWs surrounding the Property, including Northwest 45th Street, Northwest 46th Street, 14th Avenue Northwest, and 15th Avenue Northwest were dedicated to the use of the public. The City of Seattle currently retains ownership of the surrounding ROWs. The dedication is included with this report as Appendix D.

2.2.4 Summary

Based on information reviewed in the course of this investigation, it appears that the original grade of the Property was approximately 11.5 feet below the current surrounding street grade. By 1889, the ROWs surrounding the Property had been deeded to the City of Seattle. By 1903, the grade of the Property and surrounding streets had been raised to the current foundation grade of the former Wesmar Building, which was constructed in 1905, when Pacific Coast Pipe Co. and City Electric Light and Waterworks occupied the Property. The surrounding streets were raised to their current elevation during a subsequent regrading event that occurred in 1913. In 1917, the eastern portion of the Property was used for the storage of pipes treated by the Pacific Coast Pipe Co. The pipe treatment facility appeared to operate on the Property until 1947, when Durabilt Luggage Co. constructed the former ColorTech building, and in 1950, R.D. Bodle Fruit and Vegetable Cannery operated on the Property. The most recent occupants, Wesmar and Colortech, occupied the Property between 1979 and 2007.

2.3 ENVIRONMENTAL SETTING

2.3.1 Land Use

As discussed above, the Property is located within the North BINMIC area, and land use on the Property and surrounding parcels is primarily industrial. Additionally, there are several retail stores, office buildings, and other commercial uses within BINMIC, the majority of which are located in the vicinity of Northwest Leary Way to the north of the Property (Floyd Snider McCarthy 2003).

Although a small number of residential properties are located within the north BINMIC area, the subject Property and vicinity are zoned industrial by the City of Seattle (Seattle Municipal Code 23.50), and new residential developments are not permitted. Any residences located within the BINMIC area were constructed prior to adoption of the industrial zoning codes.

The Property is scheduled to undergo redevelopment to a multi-story, mixed-use commercial/retail complex. Redevelopment plans involve construction of a subsurface parking garage to an approximate depth of 20 feet below the surrounding street-surface grade. Slated improvements also include public open space on the southwest corner of Property within the Lake Washington Ship Canal waterway setback and improvements to the public ROWs, including new sidewalks, trees, improved lighting, and upgrades to the Burke-Gilman Trail.

2.3.2 Topography

The Property slopes gently toward the Lake Washington Ship Canal, which is located approximately one block to the south of the Property. Street grade elevations are between 25 feet (Northwest 45th Street) and 30 feet (Northwest 46th Street) according to NAVD 1988. The Property interior is located approximately 8 to 10 feet below the surrounding street grade (Photographs 2 and 4).

2.3.3 Meteorology

The climate of the area is maritime and experiences moderate seasonal fluctuations in temperature. The historical average annual rainfall in the Seattle area is approximately 33.7 inches (Richardson et al. 1968), with peak rainfall occurring in the months of December and January. More recent averages suggest upwards of 38 inches of annual rainfall (http://www.weather.com/weather/wxclimatology/monthly/USWA0395). Surface water runoff and evapotranspiration are estimated at 15 inches annually in the North BINMIC area (Richardson et. al 1968), leaving only a modest amount of annual rainfall as potential recharge to groundwater.

2.3.4 Groundwater Use

No active production wells are located within the North BINMIC area, and groundwater use is generally limited to non-potable emergency and industrial supply wells. According to 173-Chapter 340-720 WAC, “Groundwater cleanup levels shall be based on estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and future site conditions.” The highest beneficial use of regional shallow groundwater and groundwater beneath the Property has, therefore, been identified in the BINMIC Hydrogeological and Environmental Settings Report (Floyd Snider McCarthy 2003) as surface water discharge. However, Ecology has determined that the Site groundwater is a potential future source of drinking water because it may be hydrologically connected to the Lake Washington Ship Canal, which is designated as domestic water according to WAC 173-201A§602. As a result, the MTCA Method A cleanup levels for groundwater (Chapter 173-340-720) are proposed as the Site-specific cleanup levels.

2.3.5 Environmental Quality of Regional Soil and Groundwater

By 1896, Ballard was known as the “Shingle Mill Capital of the World.” Archived records for the area and historical photographs taken in the early 1900s (Photographs 4 through 7 and 10 through 12) suggest that much of the area was occupied by railroad lines and industrial facilities, which included cedar shingle mills, lumber factories, wood treatment facilities, and metal works. By-products of such extensive railroad use and industrial activities included contamination of soil and groundwater by metals, PAHs, and petroleum hydrocarbons. In addition, the use of fill material, of unknown origin, to bring the Property and surrounding streets up to their current grade may have contained these contaminants.

The environmental quality of soil and groundwater within the North BINMIC area has been evaluated in the BINMIC Hydrogeological and Environmental Settings Report (Floyd Snider McCarthy 2003). According to the report, the most commonly encountered contaminants include petroleum hydrocarbons, PAHs, volatile organic compounds (VOCs), and heavy metals. It should be noted that the BINMIC report excluded any data collected from facilities owned and operated by BNSF. Data relating to the Property is summarized below.

2.3.5.1 Environmental Quality of Groundwater

Shallow groundwater in the North BINMIC Area is generally encountered between 2 and 20 feet bgs within the near-surface fill material, much of which has been negatively impacted by historical and on-going industrial activities. Vashon Till serves as a confining layer beneath the fill, and it reduces the downward migration of contaminated groundwater. In addition, groundwater within the North BINMIC area is not currently used as a drinking water source or for industrial purposes. Concentrations of contaminants commonly encountered within the shallow groundwater of the North BINMIC area and applicable to this RI are summarized below.

Aromatic Hydrocarbons. The average concentrations of PAHs detected in groundwater within the North BINMIC area ranged from 0.08 micrograms per liter (µg/L) to 35 µg/L (Floyd Snider McCarthy 2003).

Petroleum hydrocarbons as gasoline ranged in average concentration from 7,474 µg/L to nearly 100,000 µg/L and petroleum hydrocarbons as diesel ranged from 292 µg/L to more than 19,000 µg/L (Floyd Snider McCarthy 2003).

Heavy Metals. According to the BINMIC guidance document, average concentrations of arsenic in shallow groundwater ranged from 3 µg/L to 160 µg/L (Floyd Snider McCarthy 2003). As stated previously, data included in the BINMIC report excluded any data collected from facilities owned and operated by BNSF.

2.3.5.2 Environmental Quality of Soil

The near-shore areas within the North BINMIC area, which include the Property, were filled with materials generally derived from anthropogenic sources. Near-surface soil in the area has been widely impacted by historical activities; contaminants commonly identified within the fill and shallow native soil are described below.

Aromatic Hydrocarbons. For the purposes of this discussion, aromatic hydrocarbons include both PAHs and petroleum hydrocarbons as gasoline, diesel, and oil.

The average concentrations of PAHs detected in near-surface soil at locations within the North BINMIC area ranged from 0.10 milligrams per kilogram (mg/kg) to 116 mg/kg. Sources of PAHs, which are among the most prevalent contaminants within the North BINMIC Area, frequently result from the use of fill material during the Ballard regrade activities, treated wood processing and storage, and creosote-treated piers and rail ties

(Floyd Snider McCarthy 2003). In addition to the sources identified in the BINMIC report, other potential sources of PAHs in the BINMIC area may include the use of waste oils containing bunker fuel, which is laden with PAHs, for dust suppression on the former exposed dirt ROWs, as well as railroad activities incorporating the use of bunker oils to fuel train engines.

Petroleum hydrocarbons as gasoline ranged in average concentration from 285 mg/kg to more than 44,000 mg/kg; petroleum hydrocarbons as diesel ranged from 267 mg/kg to nearly 5,000 mg/kg. Sources of petroleum hydrocarbon contamination include underground heating oil tanks, maintenance and other activities conducted along rail lines, and vehicle maintenance (Floyd Snider McCarthy 2003). In addition to the sources identified in the BINMIC report, other potential sources of petroleum hydrocarbons in the BINMIC area include the use of waste oil for dust suppression on the formerly exposed ROWs and railroad activities, including the use of bunker oils to train engines.

Heavy Metals. Arsenic has been identified as a COC for the former Wesmar property, and according to the BINMIC guidance document, average concentrations of arsenic in near-surface soil ranged from 7 mg/kg to 116 mg/kg (Floyd Snider McCarthy 2003). Although the source for the arsenic contamination was not discussed in the BINMIC report, likely sources include fill materials, American Smelting and Refining Company (ASARCO) slag used in railroad ballast, and the use of arsenic-containing herbicides along the rail lines and roads in the area. Further discussion of potential arsenic sources is included in Section 4.2.

2.4 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.4.1 Regional Geology

The native geologic materials underlying the North BINMIC area consist of glacial and non-glacial depositional materials to depths of more than 1,500 feet bgs. Fill materials predominate from the surface to depths of between 10 and 30 feet bgs. The area-wide fill generally consists of loose silt, sand, and clay with wood and construction debris, including creosoted railroad ties and old piers. Because of the thick fill layer in the region and the shallow depth to groundwater, perched groundwater is frequently encountered within the fill deposits. Native soil consisting of stiff to loose silt and fine sand layers with occasional clay and peat layers underlies the fill materials. The uppermost soil underlying the fill is described as Holocene Depression Fillings, below which is generally the Vashon Recessional Outwash (VRO) consisting of medium-dense silt to gravelly sand at depths generally between 10 and 30 feet bgs. Underlying the VRO and Holocene fill is Vashon Glacial Till (VGT) and Lawton Clay beginning at depths of 30 to 60 feet and extending to depths of 90 feet or more (Floyd Snider McCarthy, 2003); regional geologic maps show the VRO is absent or very thin in the area of the former Wesmar Property, and the Holocene deposits rest directly on top of the VGT. A more complete description of the regional geology is available in the BINMIC Hydrogeological and Environmental Settings Report (Floyd Snider McCarthy 2003).

2.4.2 Regional Hydrogeology

Within the North BINMIC area, shallow groundwater is first encountered within the fill material at depths between 1 and 20 feet bgs (Floyd Snider McCarthy 2003). The saturated thickness of the shallow aquifer is between 20 and 30 feet. Shallow groundwater flows downward from the surrounding hillsides into the Ship Canal and Salmon Bay, although vertical movement is limited due to the dense VGT and Lawton Clay confining layers that are located beneath the first water-bearing interval. The general regional groundwater flow direction is toward the south-southwest, although it is noted that local variations in stratigraphy and anthropogenic influences, including sanitary and storm sewer lines, impact groundwater movement and flow direction (Floyd Snider McCarthy 2003).

2.4.3 Property Geology

The shallow subsurface geology at the former Wesmar Property is primarily comprised of two distinct geological units. The uppermost unit consists of anthropogenic fill materials from ground surface to depths of 12 to 16 feet around the edges of the Property, or at an elevation of approximately 10 to 14 feet (according to NAVD 1988). The thickness and depth of fill is depicted on cross-sections A-A', B-B', C-C', D-D', and E-E' (Figures 2, 6, and 6a through 6d, respectively). The fill is comprised of a wide range of grain sizes and materials, but generally consists of a sand-silt mixture with abundant wood and construction debris. A relatively uniform and laterally extensive layer of silt with fine sand unit underlies the fill. This unit has been interpreted to be native deposits, and it is classified as VGT, although it may consist of some less consolidated Holocene deposits. This material extends from approximately 10 to 5 feet above MSL. Dense to very dense silts, sands, and clays are found from approximately Elevation 5.0 feet to the maximum depth explored Elevation -30.5 feet. This appears to be glacial till material believed to be from the Pre-Vashon glaciation period. It consists of silty sand primarily at the upper interface and grades discontinuously to clay and silt at the planned excavation depth (SES 2008b). As stated in Section 2.2.2, the elevation of the fill/native interface on the Property and in the surrounding ROWs is generally consistent with the grade elevations identified in the 1903 historical information (Appendix C).

2.4.4 Property Hydrogeology

SES advanced 62 borings (B01 through B62) on and around the former Wesmar Property between September 29, 2005, and August 1, 2008 (Figure 6) (Appendix E). Seventeen of these borings—B06 through B08, B10 through B12, B17, B19, B22, B24, B25, B27, B46, B49, and B50—were converted to groundwater monitoring wells (MW01 through MW17, respectively). Four monitoring wells installed by SES to evaluate groundwater associated with the BBI property by others (MW01 [BB1] through MW04 [BB1]) are located across Northwest 46th Street on the north-adjacent parcel. Monitoring of the wells has been conducted since they were constructed between September 2005 and November 2007. Depths to groundwater range from approximately 0 to 9 feet bgs across the Property, with greater depths observed in wells installed around the perimeter of the Property. Table 2 provides the most recent depth-to-groundwater measurements, which were collected on December 6, 7, and 14, 2007.

Based upon the groundwater elevation data and inference from topography, local drainage patterns, and surface water flow, it appears that shallow groundwater in the vicinity of the Property generally flows in a southerly direction with some local variations toward sewer lines and other subsurface features that may provide preferential pathways. For instance, groundwater beneath the eastern portion of the Property flows toward the 96-inch-diameter combined sewer, which acts as a hydrogeologic depression located beneath 14th Avenue Northwest. Figure 7 depicts interpreted groundwater elevation contours, although the localized mound in shallow groundwater at well MW09 in the southeast corner of the Property has been excluded from the groundwater contour map. Groundwater surfaces near MW09 in the street in the form of a seep. According to former occupants of the Property, perennial groundwater seepage has been observed over the past 25 years near the southeastern corner of the Property. Seep water currently flows northward from the seep into an adjacent catch basin at an estimated rate of approximately 22 gallons per minute. The seep locally affects the potentiometric surface of the on-Property groundwater by creating a groundwater mound in the potentiometric surface and causing groundwater in its immediate vicinity to flow north toward the center of the Property. In general, however, groundwater flows in a southerly direction toward the Lake Washington Ship Canal.

The groundwater seep has been evaluated in some detail since Fall 2006. Specific conductance, major ions (calcium, magnesium, sodium, potassium, and chloride), iron, and manganese concentrations in the seep are substantially lower than background concentrations in groundwater. In addition, the temperature of the seep (12.3 degrees Celsius [°C] on October 10, 2006) was several degrees colder than groundwater temperatures measured on the same day (15 to 18 °C). The average air temperature in Seattle on October 10, 2006, was 12.2° C, identical to that of the seep, and the seep water contains elevated concentrations of dissolved oxygen (DO) relative to DO concentrations in groundwater. The laboratory and field data collected on the seep water suggests that the source of the seep water may be a leaking water line. Such a water line leak could be causing the seep, and it potentially could be assimilating compounds from the nearby sewer line. On behalf of the Property owner, SES has requested that the City of Seattle evaluate and control this water source.

2.5 PREVIOUS INVESTIGATIONS

In 2005 and 2006, SES conducted a series of preliminary subsurface investigations on the Property and within the adjacent ROWs, as described below.

2.5.1 Summary of Subsurface Investigations

Three subsurface investigations have been conducted at the Property and its vicinity since 2005. The locations of soil borings, monitoring wells, and other Property features are shown on Figure 6. The soil and groundwater analytical results are summarized in Figures 8, 8a, 9, and 10 and in Tables 2 through 6. For evaluation purposes, those concentrations that exceed the current MTCA Method A cleanup levels for soil and groundwater are presented in bold red font. The remainder of this report includes references to cleanup levels; unless otherwise specified, these refer to the MTCA Method A Cleanup Levels for Unrestricted Land Use for soil and MTCA Method A Cleanup Levels for Groundwater

2.5.1.1 2005 Subsurface Investigation

In September 2005, Bridge Group II, LLC requested that SES conduct a limited subsurface investigation of the Property as part of their due diligence. SES oversaw the installation of five push-probe soil borings (B01 through B05) on September 29, 2005. Borings were advanced to depths between 6 and 15 feet bgs, and soil and water samples collected from the borings were tested for the presence of VOCs, PAHs, diesel-range petroleum hydrocarbons (DRPH), and metals.

Groundwater Results. Benzo(a)pyrene did not exceed the cleanup level in any of the groundwater samples submitted for analysis (Table 2). DRPH exceeded the cleanup level in the groundwater sample collected from boring B03. The sample was rerun with a silica gel cleanup, after which the concentration of DRPH dropped to below the cleanup level. Groundwater collected from each of the borings contained elevated concentrations of arsenic, chromium, and/or lead; however, it should be noted that the groundwater data is considered qualitative because of the use of push-probe technology.

Soil Results. Concentrations of carcinogenic PAHs (cPAHs), including benzo(a)pyrene, exceeded the cleanup level in soil samples collected from borings B01, B04, and B05, which were advanced on the eastern and southern portions of the Property to depths between 5.5 and 15 feet bgs (Figure 8 and Table 3). The concentration of arsenic in the soil sample collected from B04 also exceeded the cleanup level (Figure 9 and Table 4). VOCs were not detected in any of the samples submitted for analysis (Table 5).

2.5.1.2 2006 Subsurface Investigations

Two supplemental subsurface investigations were conducted at the Property and its vicinity in September and October 2006 to evaluate the horizontal and vertical extent of contamination identified in soil and groundwater beneath the Property, specifically the source, nature, and extent of elevated arsenic and PAH concentrations in soil and groundwater beneath the Property and in the vicinity of former railways located on and adjacent to the Property. These investigations included the construction of groundwater monitoring wells in order to compare sampling results with those of the earlier push-probe sampling event.

On September 6 through 12, 2006, SES oversaw the advancement of 16 soil borings (B06 through B21) at the Property using a combination of hollow-stem auger (HSA) and direct-push drilling technologies. Soil borings were advanced to depths between 5 and 30 feet bgs, and eight of the borings were completed as monitoring wells (B06 [MW01], B07 [MW02], B08 [MW03], B10 [MW04], B11 [MW05], B12 [MW06], B17 [MW07], and B19 [MW08]). Soil and groundwater samples were analyzed for the presence of petroleum hydrocarbons, VOCs, PAHs, pentachlorophenol (PCP), and metals.

On November 17, 2006, SES oversaw the advancement of four soil borings (B22 through B25) within the ROW using a combination of HSA and direct-push drilling technologies. Soil borings were advanced to depths between 12 and 24 feet bgs, and three of the borings were completed as monitoring wells (B22 [MW09], B24 [MW10], and B25 [MW11]). In addition, a near-surface-grade sample of railroad ballast was collected. Soil and groundwater samples were analyzed for the presence of petroleum hydrocarbons, VOCs, PAHs, and metals.

Groundwater Results. Groundwater monitoring was conducted for the Property to provide Ecology with supplemental data in order to facilitate their technical review of the Property as part of the formal cleanup process. Groundwater monitoring was conducted in September 2006, October 2006, November 2006, and June 2007. Results of the groundwater monitoring events suggest that arsenic is the primary COC in groundwater (Table 2). The highest concentrations of arsenic were detected in groundwater samples collected from MW07, which was advanced in the 14th Avenue Northwest ROW in an inferred cross-gradient location relative to the Property. However, total and dissolved arsenic concentrations above the cleanup level were detected in 11 monitoring wells associated with the Property (MW01 [BB1], MW02 [BB1], MW04 [BB1], MW01, MW03 through MW08, and MW11; Table 2 and Figure 10).

Concentrations of benzene and DRPH exceeded their respective cleanup levels in groundwater collected from MW08 only during the first sampling event (September 20, 2006), and only one PAH constituent, naphthalene, was detected above the MTCA Method A Cleanup Level in groundwater collected from MW08 during the June 13, 2007 sampling event. No carcinogenic PAHs were detected in any of the groundwater samples submitted for analysis (SES 2006a).

Soil Results. Soil samples that contained concentrations of potential COCs in excess of their respective cleanup levels generally were collected from within the fill layer underlying the Property. Concentrations of PAHs, including benzo(a)pyrene, exceeded the cleanup level in soil samples collected from borings B08, B12, B14, B16, B17, B19, B20, and B21, which were advanced on the eastern two-thirds of the Property in the vicinity of the former wood treatment operations (Figures 4, 5, 8, 8a, and Table 3). The concentrations of arsenic in soil samples collected from B08 and B17, which were advanced on the southern and eastern Property boundaries, were slightly elevated relative to the MTCA Method A cleanup level (Table 4). Concentrations of benzene and trichloroethene were detected above their respective cleanup levels only in soil collected from B16 (Table 5), which was advanced east of the former dip tank identified in the 1905 Sanborn Fire Insurance Map (Figure 4 and Appendix B). PCP was not detected in any of the samples submitted for analysis.

Both arsenic and lead were detected at concentrations above their respective cleanup levels in the off-Property railroad ballast sample (Table 4).

2.6 CHEMICALS OF POTENTIAL CONCERN

Based on the investigations conducted to date and review of land use history, petroleum hydrocarbons, PAHs, arsenic, lead, VOCs, PCP, and polychlorinated biphenyls (PCBs) were identified as the chemicals of potential concern for the Property. Although no detectable concentrations of PCP were observed in any of the soil or groundwater samples submitted for analysis during previous subsurface investigations, the presence of PCP and PCB contamination beneath the former ColorTech building remained unknown prior to conducting the RI.

2.7 MEDIA OF CONCERN

Soil and groundwater are the two media of concern at the Property. Vapor is not considered a medium of concern because future land use will involve excavation of on-Property soil to a depth of approximately 20 feet below current street grade.

2.8 DATA GAPS

Prior to conducting the RI, several data gaps with respect to the origin and distribution of the COCs in soil and groundwater that existed at the Property were identified, including:

- **Current environmental quality of the soil beneath the Colortech building.** Until recently, the Colortech building, which is located on the eastern portion of the Property, was not accessible for drilling. According to Sanborn Fire Insurance Maps (Figures 4 and 5; Appendix B), that portion of the Property was used to dry and store the treated wooden pipes produced by the Pacific Coast Pipe Co.
- **Extent of on-Property PAH contamination to the north, east, and south.** Soil collected from the northernmost on-Property boring (B21), easternmost on-Property boring (B17), and three of the southernmost on-Property borings (B01, B08, and B12) contained concentrations of cPAHs that exceed the cleanup level.
- **Potential source for arsenic-contaminated groundwater.** The high concentrations of arsenic observed in groundwater collected from the southeast portion of the Property could suggest the presence of a nearby source in soil. Based on available soil data, such a source has not yet been clearly identified.
- **Magnitude of arsenic-laden slag railroad ballast and/or windblown deposition of arsenic-containing air particulates from ASARCO.** The potential for a wind-transported and/or mechanically distributed arsenic source has not been fully addressed in previous investigations, nor has the arsenic content of the railroad ballast. Furthermore, the historical

land use in the immediate vicinity of the Property had not yet been verified, and additional arsenic sources may exist.

3.0 REMEDIAL INVESTIGATION

SES representatives mobilized to the field on November 19 through 21, November 27, and December 6, 7, and 14, 2007; and April 23, June 6, June 17, and August 1, 2008 to conduct the RI activities as described in the RIWP (SES 2007g) and the Supplemental RIWP (SES 2008a) per review and approval from Ecology.

3.1 PRE-FIELD ACTIVITIES

Before sampling activities were conducted, traffic control plans were prepared, street use permits were acquired, and public utility locates were conducted. Available utility maps (e.g., side sewer cards from DPD, King County Metro, and City of Seattle Engineering Department) also were reviewed to identify proposed sample locations that might intersect or otherwise interfere with known utility corridors.

Subcontractors that provided services on the project included a private utility locator (Underground Detection Services, Inc.), two drilling contractors (ESN Northwest and Cascade Drilling, Inc.), and an Ecology-accredited analytical laboratory (Friedman & Bruya, Inc.). Prior to conducting the fieldwork, a Health and Safety Plan was prepared for use during drilling activities.

3.2 SOIL SAMPLING

3.2.1 Near-Surface Soil Samples

Sampling surface soil followed the procedures in the RIWP Sampling and Analysis Plan (SAP) (Appendix B of the RIWP, SES 2007g). Sample locations are shown on Figure 6. Grab surface soil samples were collected along the former BNSF railroad at depths between 0 and 2 feet bgs. Samples were analyzed for arsenic and lead by EPA Method 200.8.

Deviations from the RIWP. The following deviations from the RIWP are noted for subsurface soil sampling: Additional near-surface soil samples were collected along the former railroads in an effort to gain a broader understanding of related arsenic contamination, if present (Figure 6).

3.2.2 Subsurface Soil Samples

Thirty-six soil borings were advanced on the Property, along the northern and southern Property boundaries and within the 14th Avenue ROW (Figure 6). Each of the borings described below was advanced using a push-probe drilling, HSA drill rig, or hand auger methods to depths of approximately 1 to 30 feet bgs. Soil samples were collected in approximate 5-foot intervals using the procedures described in the SAP (SES 2007g) and at specific intervals at which PAH exceedances had previously been confirmed (SES 2008a).

Relatively undisturbed soil samples were obtained from the borings throughout the maximum depths explored. Selected portions of each recovered soil core sample were placed in a plastic bag so that the presence or absence of VOCs could be quantified using a photoionization detector (PID). Intervals of each recovered soil core sample selected for potential laboratory chemical analysis was placed into laboratory-prepared glassware in accordance with United States Environmental Protection Agency (EPA) Method 5035A. Subsurface lithology was classified using the Unified Soil Classification System (USCS), and boring logs are included in Appendix E. Sampling locations are shown on Figure 6.

Push-Probe. Thirty-one push-probe soil borings (B26, B28 through B45, and B51 through B62; Figure 6) were advanced during the RI. Soil samples collected from within the fill material were analyzed for arsenic. Samples collected at the lowest on-Property surface grade and immediately below the fill/native interface were submitted for analysis of arsenic by EPA Method 200.8 and PAHs by EPA Method 8270C SIM. Any samples that exhibited hydrocarbon or creosote staining and/or odor or that resulted in anomalous readings on the PID were submitted for analysis of VOCs by EPA Method 8260B, petroleum hydrocarbons by Northwest Methods NWTPH-Dx and/or NWTPH-Gx, and PAHs by EPA Method 8270C SIM.

Hollow-Stem Auger. Five HSA soil borings (B27 and B46 through B50; Figure 6) were advanced during this investigation and were completed as monitoring wells (MW12 through MW16, respectively). At every 5-foot interval, an 18-inch split-spoon sampler containing a stainless steel sleeve was driven into the soil. Soil samples collected from within the fill material were analyzed for arsenic. Samples collected at the lowest on-Property surface grade and immediately below the fill/native interface were submitted for analysis of arsenic by EPA Method 200.8 and PAHs by EPA Method 8270C SIM. Any samples that exhibited hydrocarbon or creosote staining and/or odor or that resulted in anomalous readings on the PID were submitted for analysis of VOCs by EPA Method 8260B, petroleum hydrocarbons by Northwest Methods NWTPH-Dx and/or NWTPH-Gx, and PAHs by EPA Method 8270C SIM.

Deviations from the RIWP. The following deviations from the RIWP are noted for subsurface soil sampling:

- The names of borings/monitoring wells were changed according to the order in which they were installed. New boring names/locations are presented on Figure 6.
- Due to the density of the native soil, some of the push-probe soil borings were not advanced as deep as initially planned. However, all borings, with the exception of those located within the 14th Avenue Northwest ROW, were advanced beyond the fill/native interface.
- Native soil was not encountered within 14th Avenue Northwest due to the presence of a 96-inch-diameter sewer line.
- Two shallow soil borings (B51 and B52) were advanced approximately 10 feet south and 10 feet west, respectively, of B42 in an effort to bound the PAH contaminated soil identified in that area.
- One additional push-probe soil boring (B60) was advanced within the Northwest 46th Street ROW to the north of the Property in an effort to bound the PAH contamination observed in B53 and B55.
- Two additional push-probe soil borings (B61 and B62) were advanced within the former Wesmar building once the tenants vacated the premises. The borings were advanced to evaluate the environmental quality of soil in the vicinity of B47 along the northern Property boundary.

3.3 MONITORING WELL INSTALLATION AND DEVELOPMENT

3.3.1 Monitoring Well Installation

Five monitoring wells (MW12 through MW17) were installed using HSA drilling methods. Monitoring well locations are shown on Figure 6. As proposed in the RIWP, monitoring well installation followed the RIWP SAP (Appendix B of the RIWP, SES 2007g). All wells were completed with the top of casing flush to the ground. Monitoring wells were constructed using 2-inch-diameter Schedule 40, polyvinyl chloride (PVC) well casing with flush-threaded joints. The wells were screened using Schedule 40 slotted PVC screen with 0.010-inch factory-machined slots. A filter pack consisting of 10-20 silica sand was placed in the annular spacing. Monitoring wells were constructed with 10 feet of well screen. Approximately 2 to 4 feet of screen was located above the top of the water table, and approximately 6 to 8 feet of screen was located below the top of the water table. Because groundwater is so shallow beneath the center of the property, a well variance from Chapter 173-160-450 WAC was acquired for the Property in order to screen the wells within 2 feet of the ground surface. Screening the wells across the water table allows for seasonal fluctuations in groundwater elevation and for measuring the thickness of separate-phase hydrocarbons, if present.

Deviations from the RIWP. The following deviations from the RIWP are noted for monitoring well installation:

- The names of borings/monitoring wells were changed according to the order in which they were installed. New boring names/locations are presented on Figure 6.
- Although the RIWP stated that wells located along the northern Property boundary should be screened from 16 to 30 feet bgs, they were screened from 6 to 16 feet bgs.
- An additional well was installed in 14th Avenue Northwest.
- Because of access issues, a well could not be installed within the Colortech building.

3.3.2 Monitoring Well Development

Monitoring wells were developed in accordance with the SAP (Appendix B of the RIWP, SES 2007g). The well was surged by manually raising and lowering a surge block through the water column and purging between 5 and 10 well casing volumes. The wells were developed until turbidity dropped to 5 nephelometric turbidity units (NTU), if possible. All equipment was decontaminated after each well was developed.

Water removed during development was placed in labeled drums for subsequent characterization and disposal. The wells were allowed to stabilize for at least 1 week before they were sampled.

3.4 GROUNDWATER SAMPLING

The newly installed groundwater monitoring wells were developed 1 to 2 days following installation. Groundwater sampling of the wells installed prior to the RI (MW01 through MW11) was conducted on December 6, 2007. Wells installed during the RI (MW12 through MW16) were sampled on December 7, 2007 to allow sufficient time for the wells to establish connectivity with the aquifer and to reduce any remaining turbidity prior to sampling.

Water level measurements were obtained from each monitoring well using a water level indicator. A water-level probe attached to a measuring tape and reel was lowered into a well until the audible alarm sounded. A measurement was taken by reading the depth from the graduated tape from a measuring point mark located on the north side of the top of the PVC well casing. The water levels in each of the wells were recorded to the nearest 0.01 feet. Monitoring well water level measurements, which were recorded on groundwater sampling forms, also are summarized in Table 2.

The wells were purged using a low-flow peristaltic pump. Field parameters, including temperature, pH, electrical conductivity, turbidity, oxidation reduction potential, and DO, were measured and recorded periodically during purging of the well. Select groundwater samples were field-filtered using 0.1- or 0.45-micron filters to evaluate dissolved arsenic concentrations according to historic total arsenic concentrations. Once the field parameters stabilized between measurements (e.g., specific conductivity ±10 percent, pH ±0.1 pH units, temperature ±0.1°C), samples were collected in laboratory-supplied sample containers at the same low flow rate used for purging. Sample data was recorded on a groundwater sample collection form and included the sample number and time collected, the observed physical characteristics of the sample (e.g., color, turbidity, etc.), and the field parameters discussed above.

To prevent degassing during sampling for VOCs, a pumping rate was maintained below 500 milliliters/minute. The VOC and GRPH containers were filled completely so that no head space remained. Samples were chilled to 4°C immediately after the samples were collected.

Based on the locations of the wells and historical concentrations of COCs, groundwater samples collected during the RI were submitted for laboratory analysis of ORPH and DRPH by Northwest Method NWTPH-Dx; PAHs and PCP by EPA Method 8270C SIM; PCBs by EPA Method 8082; total and dissolved arsenic and lead by EPA Method 200.8; and/or benzene, toluene, ethylbenzene, total xylenes, and VOCs by EPA Method 8260B.

Deviations from the RIWP. The following deviations from the RIWP are noted for groundwater sampling:

- No deviations from the groundwater sampling protocol outlined in the RIWP were required by field conditions.

3.5 PROPERTY SURVEY

ESM Consulting Engineers, LLC conducted a professional survey of the Property on December 12, 2007, using NAVD 1988 as a survey benchmark. The survey included recording top-of-casing elevations for each of the monitoring wells on the property (Table 2).

3.6 MANAGEMENT OF INVESTIGATION-DERIVED WASTE

A substantial quantity of investigative-derived waste (IDW) was generated during the RI. Solid IDW included drill cuttings, the remainder of homogenized soil from sampling, contaminated disposable equipment, and contaminated disposable personal protective equipment. Liquid IDW included wastewater from decontamination procedures and monitoring well development and purging. IDW was containerized in appropriately labeled 55-gallon drums stored on the Property and is scheduled for disposal at a permitted facility.

3.7 REMEDIAL INVESTIGATION RESULTS

The following section presents a summary of the analytical data collected during the RI.

3.7.1 Groundwater

Groundwater was collected from monitoring wells MW01 through MW17 in December 2007. Groundwater collected from wells MW01, MW03 through MW05, MW07, MW08, MW11, MW15, and MW16 contained dissolved arsenic concentrations that exceeded the cleanup level (Figure 10, Table 2). Groundwater collected from MW17, which is located to the northeast of the property within the 14th Avenue Northwest right-of-way, contained a diesel concentration of 530 µg/L, which slightly exceeded the MTCA Method A Cleanup Level for Groundwater. Naphthalene was detected at a concentration that slightly exceeded the cleanup level in groundwater collected from MW08, which is located in the center of the Property.

3.7.2 Soil

Near-Surface Soil Samples. Ballast samples collected from RR01, RR02, RR04, and RR10 contained concentrations of arsenic that exceeded the cleanup level. RR01 and RR02 contained the highest arsenic concentrations at 87.8 and 93.3 mg/kg, respectively. The ballast sample collected from RR10 also contained a lead concentration of 276 mg/kg, which exceeded the cleanup level of 250 mg/kg (Table 4).

A near-surface soil sample collected from B42, which is located near the southwest corner of the Property, contained a benzo(a)pyrene exceedance at 1 foot bgs. Two soil borings, B51 and B52, were advanced approximately 10 feet to the south and southwest, respectively, of B42; soil collected from these borings at a depth of 1 foot bgs did not exhibit elevated concentrations of PAHs.

Subsurface Samples. Soil samples collected from B28, B34, B40, B47, B54, B55, B61, and B62 contained concentrations of benzo(a)pyrene in excess of the cleanup level (Figure 8, Table 3). Samples that contained the exceedances were collected from within the fill layer; soil samples from B28 and B40, which are located on the eastern portion of the Property, were collected within the fill at depths of 7 feet and 2.5 feet bgs, respectively. Soil borings B47, B54, and B55 were located on and just beyond the northern Property boundary; exceedances were observed at a depth of 11.5 feet bgs, in conjunction with a 6-inch- to 1-foot-thick layer of black-stained soil that exhibited a strong creosote odor. The layer was located at an elevation that was consistent with the 1889 to 1903 grade of the ROW. Soil collected from boring B34, which was located near the southern Property boundary, contained a concentration of benzo(a)pyrene that exceeded the cleanup level at a depth of 9 feet bgs. Soil collected from two soil borings (B56 and B57) that were advanced approximately 10 feet south of B34 did not contain elevated concentrations of PAHs.

Using the toxicity equivalence methodology in Chapter 173-340-708(8) WAC, equivalent concentrations of the remaining carcinogenic PAHs, including benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene were calculated relative to benzo(a)pyrene (Table 6). The total toxicity equivalent soil concentration for the cPAH mixture exceeded the cleanup level of 0.1 mg/kg in each of the soil samples discussed above, as well as in B46 at a depth of 5 feet bgs. The cPAH exceedances at each location are correlative with the detection of benzo(a)pyrene; therefore benzo(a)pyrene will be used as the indicator chemical for PAH contamination.

Soil samples B55, B61, and B62, which were advanced within the Northwest 46th Street ROW and on the northern portion of the Property, respectively, contained elevated concentrations of DRPH and/or ORPH, which appeared to be present in association with the high concentrations of PAHs observed in the soil samples collected from these borings.

Soil samples collected from B27, B28, B31, and B32, which were advanced near or along the northern Property boundary, contained concentrations of arsenic that were slightly elevated relative to the cleanup level at depths between 11 and 12 feet bgs. Boring B44, located on the southern Property boundary, contained an arsenic concentration of 45.5 mg/kg at a depth of 1 foot bgs. Soil boring B43, located approximately 90 feet to the east of B44, contained an arsenic concentration of 66.0 mg/kg at a depth of 17 feet bgs; both B43 and B44 were advanced along a rail line (Figure 9).

None of the soil samples collected during the RI contained concentrations of VOCs, PCP, or PCBs in excess of their respective cleanup levels.

3.7.3 Chemicals of Concern

Based on the findings of the investigations conducted on and adjacent to the Property, the two primary COCs for the Property are benzo(a)pyrene in soil and arsenic in groundwater.

Secondary COCs identified for the Property include the remaining PAHs, VOCs, arsenic in soil, and petroleum hydrocarbons. The impact of these COCs will be mitigated during Property redevelopment and are not anticipated to pose any risk additional to that associated with the primary COCs identified above.

4.0 SITE CONCEPTUAL MODEL

This section presents the current understanding of how the contamination associated with the Property and vicinity was released or deposited, the media in which it is found, and the potential migration pathways to potential receptors.

4.1 SITE DEFINITION

Based on the findings from the investigations conducted by SES between September 2005 and August 2008 and the historical research presented in this report, the Site has been defined to include the following criteria:

- Extent of PAH-contaminated soil both on and off of the Property associated with its historical use as a wood pipe treatment facility (Figure 11). The off-Property extent of PAH contamination identified in soil borings B47, B54, and B55 are included in the Site definition.
- Arsenic-contaminated soil beneath the Property.
- Arsenic-contaminated groundwater beneath the Property. Ecology has determined that the groundwater contamination associated with the historical use of the Property is limited to Area A, identified in Figure 11.

Based on the location of the Property within the North BINMIC area, the heavy railroad use in the ROWs adjacent to the Property, and the absence of historical uses on Property that would have contributed to the local and regional arsenic soil and groundwater contamination and off-Property PAH contamination, the following criteria should be excluded from the Site definition.

- Arsenic in soil beyond the Property boundary.
- Arsenic in groundwater beyond the Property boundary.

The SCM and FS sections in this report evaluate the Site according to this definition.

4.2 CONFIRMED AND SUSPECTED SOURCE AREAS

The results of the investigations conducted on the Property between September 2005 and August 2008 suggest that elevated concentrations of PAHs and arsenic are present at several locations beneath the Property. The following is a summary of the probable sources of the contamination identified at the Property.

- **The historical use of the Property as a wood treatment facility for the City of Seattle.** The former dip tanks (visible in the 1905 and 1917 Sanborn Fire Insurance Maps; Figures 4 and 5; Appendix B) used by the wood treatment facility are located on the north-central and south-central portions of the Property. The aboveground dip tanks contained creosote, which was used to treat wooden utility pipes used by the City of Seattle (Photograph 1). Creosote contains mixtures of PAHs, including those known for their carcinogenic properties (benzo[a]anthracene chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, dibenz[a,h]anthracene, and indeno[1,2,3-cd]pyrene).
- **The historical presence of numerous railways located on or adjacent to the Property.** Prior to the construction of adjacent city streets (e.g., former Railroad Avenue), this area consisted of multiple railroad lines (Photographs 12 through 15). Portions of the Property are underlain by these former railroad lines. Railroad ballast, which is often comprised of crushed rock or waste slag originating from smelter operations, typically contains high concentrations of arsenic and other heavy metals. A ballast sample collected during a previous investigation contained the highest concentration of arsenic detected in any of the soil samples submitted for analysis. In addition, several herbicides, such as sodium arsenite, have been used extensively by railroad companies since the 1890s and are commonly found along railways. Rail ties are commonly pressure-treated with creosote and are a potential source of PAH contamination to the near-surface soil.
- **A rail line running along the north side of Northwest 45th Street is considered a potential source of arsenic at the Property.** Based on tax records maintained by King County, this rail line is currently owned by City of Seattle Department of Transportation. In addition, Sanborn Fire Insurance Maps from the early 1900s depict a major railway (former Railroad Avenue) in the present-day location of 14th Avenue Northwest. Two rail spurs also ran through the central and southern portions of the Property. The approximate locations of these rail lines and the former Railroad Avenue (circa 1910) are illustrated on Figure 6.
- **The heavy industrial activities historically conducted in the North BINMIC area.** As discussed in Section 2.3, Ballard, known by 1896 as the “Shingle Mill Capital of the World,” was an active, heavily industrial municipality since the late 1800s. Archived records for the area and historical photographs taken in the early 1900s suggest that much of the land was used for industrial purposes, which included cedar shingle mills, lumber factories, wood treatment facilities, metal works, and others. By-products of such extensive industrial activities include contamination of the region by metals, PAHs, and petroleum hydrocarbons. Contaminants have been distributed by volatilization, airborne distribution, and mechanical deposition/migration along the railway. Arsenic contained in chromated copper arsenate (a wood preservative) can also be volatilized during the treatment of wood at high temperatures (equal to or greater than 600°C) and dispersed (Kercher and Nagle 2004).

  It is also likely that heavy metal-containing windblown air particulates from the ASARCO smelting operations contributed to the arsenic concentrations observed on the Property.
- **The use of unregulated fill material beneath the Property and vicinity.** The area of Ballard in which the Property is located is underlain by fill and debris deposited during the

> multiple regrading activities that occurred in the area. As indicated in the BINMIC guidance document and observed during subsurface investigations conducted throughout Seattle, fill material commonly contains elevated concentrations of metals and PAHs.

The concentrations of COCs observed in soil and groundwater beneath the Site appear to be concentrated on the eastern three-quarters of the Property. Former industrial operations, such as wood treatment and the use of rail spurs and railways, appear to have been concentrated on this portion of the Property and may explain the pattern of contaminant distribution.

4.3 AFFECTED MEDIA

Based on the findings of the previous subsurface investigations and the RI, soil and groundwater are the affected media at the Site.

4.4 DISTRIBUTION OF CONTAMINANTS IN SOIL

PAHs. PAH contamination resulting from the former use of the Property as a wooden pipe treatment and storage facility is limited to the Property. Soil in the vicinity of the former wood treatment operations contains elevated concentrations of cPAHs. Studies conducted by the U.S. Forest Service (United States Department of Agriculture 2004) and others (Aquatic Environmental Services 2000) have demonstrated that PAHs in exposed creosote-treated wood poles and railroad ties have a maximum vertical migration of 2 feet and almost no lateral migration. As a result, the PAHs identified in soil beneath the Property likely resulted from the placement of fill on the Property to bring it up to its current grade, the past use of the Property as a wooden pipe treatment and storage facility, and from the presence of creosote-treated rail ties.

Concentrations of benzo(a)pyrene that exceeded the cleanup level generally were observed at depths between 2.5 and 6 feet below the ground surface of the Property and were confined to the fill layer beneath and immediately surrounding the Property. The cPAH exceedances at each location are correlative with the detection of benzo(a)pyrene; as a result, benzo(a)pyrene will be used as the indicator chemical for PAH contamination in both the FS and PCA.

Soil samples collected from B34, B42, and B47, all of which are located on the Property boundary, contained elevated concentrations of benzo(a)pyrene. Boring B34 was advanced in the vicinity of known operational areas, including pipe dipping and storage. Based on the historical findings, it would be reasonable to assume that the distribution of PAHs in soil would be limited to operational areas and that the lateral extent would be limited to within a few feet of the dip tanks and storage areas. PAH contamination identified in boring B34 is bound to the east, south, and west by borings B10, B45, B56, and B57.

PAH contamination identified in soil collected from boring B47 is bound to the east and west by borings B31, B32, and B53, and to the north by boring B60 (Figure 8). The concentration of benzo(a)pyrene in B47 was detected at low concentrations at a depth of 11.5 feet below the current street grade surface. In addition, PAH contamination was not identified in groundwater collected from MW14 (B47), and the likelihood that any upgradient migration of PAHs in soil would occur is very low. Considering the distance of the 1905-vintage creosote dip tank from the PAH contamination identified in soil borings advanced north of the Property boundary (borings B47, B54, and B55), and the increase in benzo(a)pyrene concentrations as distance from the north Property boundary into Northwest 46th Street increases, it is likely that the PAHs observed in the three soil borings resulted from an off-Property source and therefore may not be attributable to activities conducted on the Property. In addition, the PAHs observed in borings B55, B61, and B62 appeared in association with DRPH and/or ORPH.

Boring B42 contained an elevated concentration of benzo(a)pyrene at a depth of 1 foot bgs. The boring was advanced between two rail lines, and the PAH contamination does not appear to be related to former property use. Two soil samples (B51-1 and B52-1) were collected 10 feet south and 10 feet west of B42, respectively, in an effort to bound the benzo(a)pyrene contamination identified in B42 (Figure 8). Neither of the soil samples collected from B51 or B52 contained detectable concentrations of benzo(a)pyrene, and B42 appears to be an isolated hot spot.

Arsenic. Concentrations of arsenic detected in soil samples collected from within the ROWs and along the former BNSF railroad are likely a result of regional impacts and do not appear to be associated with activities conducted on the Property. Concentrations of arsenic exceeded the cleanup level in soil on the eastern portion of the Property and along the northern Property boundary, although soil concentrations generally exceed the cleanup level by less than 5 mg/kg. Two soil samples collected from the southern Property boundary also contained elevated arsenic concentrations. Concentrations of arsenic in soil and groundwater collected from the North BINMIC area commonly exceed the cleanup level. This is likely a result of the fill materials beneath the Property and vicinity and the ballast used in the construction of railroads. Three of the ballast samples contained the highest arsenic concentrations relative to other soil samples collected from the Property and surrounding off-Property areas. In addition, arsenic is a common compound used in herbicides and is regularly found along roads and railways in an effort to reduce the growth of weeds.

Lead. Lead was observed at a concentration exceeding the cleanup level in two of the railroad ballast samples, one of which was collected near the southeast corner of the Property. The second was collected from the eastern side of 14th Avenue Northwest. Because the samples were collected from within the railroad ballast, they do not appear to be associated with activities conducted on the Property.

VOCs. Low levels of benzene were detected in soil at one location in the vicinity of the dip tank identified in the 1905 Sanborn Fire Insurance Map. The source of the benzene contamination was likely associated with the wood treatment operations conducted on the Property and will be mitigated during redevelopment of the Property.

Petroleum Hydrocarbons. As briefly mentioned above, elevated concentrations of DRPH and/or ORPH were observed in borings B08, B55, B61, and B62. The petroleum hydrocarbons observed in the soil samples collected from these borings appear to be directly associated with the PAHs also observed. As a result, impacts associated with DRPH and ORPH will be mitigated during redevelopment of the Property.

4.5 DISTRIBUTION OF CONTAMINANTS IN GROUNDWATER

Arsenic. Concentrations in arsenic exceed the cleanup level in groundwater samples collected from the northern, eastern, and southern portions of the Property and are generally correlated with the locations of elevated arsenic concentrations observed in soil.

VOCs. Benzene and naphthalene have been detected at concentrations that exceed the cleanup levels in groundwater collected from MW08, which was installed in the vicinity of the dip tank identified in the 1905 Sanborn Fire Insurance Map. Groundwater impacts associated with VOCs appear to be limited in extent and will be mitigated during redevelopment of the Property.

Petroleum Hydrocarbons. DPRH exceeded the cleanup level in groundwater collected from monitoring well MW08 during the initial sampling event but not during subsequent monitoring events. MW08 is located in the center of the Property, and DRPH contamination appears to be limited to the immediate vicinity of the well. Impacts associated with DRPH will be mitigated during redevelopment of the Property.

The slightly elevated concentration of DRPH detected in MW17, located northeast of the Property in an inferred upgradient hydrologic position, does not appear to be associated with activities conducted on the Property and will not be addressed during redevelopment of the Property.

4.6 CONTAMINANT FATE AND TRANSPORT

Because the COCs identified above appear to be directly related to historical activities conducted on the Property, the following sections provide an evaluation of contaminant fate and transport only as it relates to the Site as defined in Section 4.1 and, therefore, focuses on PAHs in soil and arsenic in groundwater. The principal route of transport for COCs at the former Wesmar Property is via groundwater migration. However, some potential exists at present and during redevelopment for migration as dust or suspended solids to surface water pathways for sediment deposition or as fugitive dust. As most of the Property is currently capped, these surface routes are limited. They may require mitigation during remediation and development construction activities. The remainder of this section discusses the groundwater fate and transport of the primary Site-specific COCs.

PAHs. PAHs exhibit low mobility in the environment because of their very low aqueous solubility and strong affinity to adsorb to organic carbon in the soil. This is particularly relevant for the higher molecular weight cPAHs. Migration of cPAHs is strongly retarded in the presence of organic carbon. Consistent with these physical and chemical properties, cPAHs identified at the Site do not appear to have migrated any significant distance. PAHs are chemically stable and are thereby recalcitrant to degradation—biological or chemical—and remain within groundwater systems regardless of other environmental conditions. However, the low or non-detectable concentrations of PAHs within groundwater beneath the Property indicate that groundwater transport is not an issue for the Property.

Arsenic. Arsenic in groundwater is relatively mobile depending on groundwater chemistry. Arsenic migration is anticipated to be limited by the relatively low gradient at the Property and the modest permeability of fill materials. Based upon current shallow groundwater elevations, arsenic concentrations in groundwater near monitoring well MW07 would generally migrate toward the center of the Property with the potential for localized migration to the east toward the sewer main in 14th Avenue Northwest. Arsenic concentrations in soil were relatively low and were found above 20 mg/kg (the MTCA Method A Cleanup Level for unrestricted land use) in only a few boring locations and were concentrated primarily within near-surface soil (Figure 9). Arsenic in groundwater appears to originate near the east side of the Property near the railroad grade along 14th Avenue Northwest (Figure 10). It may also originate along the railroad grade along Northwest 45th Street, as it is elevated in groundwater collected from well MW03 with no apparent on-Property origin. The extent of elevated arsenic in groundwater is limited to the southeastern quarter of the Property. Migration from any on-Property source, if one exists, will be mitigated by planned Property redevelopment activities, which include a secant pile wall that will obstruct groundwater flow in the shallow subsurface beneath the Property.

4.7 PRELIMINARY EXPOSURE ASSESSMENT

The following is a discussion of the two migration pathways identified for the Site and potential targets for the PAHs and arsenic observed on the Property.

4.7.1 Soil-to-Groundwater Pathway

The results of groundwater monitoring during the RI and previous investigations conducted at the Site support the fact that the PAHs sorbed to soil do not readily partition into the groundwater, thus the soil to groundwater pathway for PAHs is considered incomplete.

Concentrations of arsenic in groundwater indicate that the soil-to-groundwater pathway is complete; however, it is apparent that the arsenic source does not originate from the Property. In the event that concentrations of arsenic in groundwater can be attributed to an on-Property source, the pathway will be removed following the removal of the fill materials located beneath the Property.

4.7.2 Soil Direct Contact Pathway

The excavation and isolation of PAH- and arsenic-contaminated soil on the Site will effectively address the soil direct contact pathway. Protection also will be provided through the institutional controls applied in the form of capping the ROW, as well as placing a deed restriction and associated environmental covenants on the title of the Property.

In addition, a preliminary evaluation of risk was calculated for the PAH contamination within the Northwest 46th Street ROW. According to Equation 745-2 in Chapter 173-340-745 WAC and in Ecology's Cleanup Levels and Risk Calculations database, the cleanup level for benzo(a)pyrene based on the potential for ingestion by a construction worker is 18 mg/kg with a 1:100,000 acceptable cancer risk. However, the calculation does not take into account the excavation worker scenario, which significantly limits the exposure duration and likelihood of contact. Per Chapter 173-340-708(3)(d) WAC:

> (d) Persons performing cleanup actions under this chapter may also use alternate reasonable maximum exposure scenarios to help assess the protectiveness to human health of a cleanup action alternative that incorporates remediation levels and uses engineering controls and/or institutional controls to limit exposure to the contamination remaining on the site.

The PAH contamination within the ROW is covered by several feet of unimpacted fill materials and an asphalt cap, has not been exposed for nearly 100 years, and is located approximately 11.5 feet bgs. The potential for future excavation work would be limited to repairing/replacing utilities and is industrial in nature. As a result, modified Method C cleanup levels are applicable to the PAH contamination within the ROW.

Because MTCA does not provide an excavation worker scenario, the Oregon Department of Environmental Quality (ODEQ) excavation worker scenario, which utilizes similar risk-based equations developed by EPA and applied under MTCA, was considered when conducting a preliminary evaluation of risk for the PAH contamination within the ROW. The ODEQ equation is based on soil ingestion, dermal contact, and inhalation with a 1:1,000,000 acceptable cancer risk. According to this equation, the acceptable exposure concentration is 59 mg/kg for benzo(a)pyrene. Adjusting this risk-based concentration (RBC) to an excavation worker with a 1:100,000 acceptable cancer risk (per MTCA), when considering MTCA's exposure scenario, which requires an acceptable cancer risk of 1:100,000, the RBC would be multiplied by a factor of 10, which results in a Site-specific RBC of 590 mg/kg benzo(a)pyrene in soil. The preliminary RBC calculated for the Site is well above the highest toxicity equivalency factor (TEF) observed in soil beneath the ROW;

this, in conjunction with the institutional controls discussed above, effectively eliminates the risk of exposure through direct contact.

5.0 FEASIBILITY STUDY

The purpose of this FS is to develop and evaluate cleanup action alternatives to facilitate selection of a final cleanup action at the Property in accordance with Chapter 173-340-350(8) WAC. A feasibility study typically includes an extensive development, screening, and evaluation process for numerous remedial alternatives. However, because Property-specific conditions preclude many potential remediation alternatives from application at the Site, the evaluation focused on a limited number of likely feasible remediation technologies and alternatives that are both implementable and capable of achieving the remediation objectives.

In addition, the FS is used to screen cleanup alternatives and eliminate those that are not technically possible, those with costs that are disproportionate under Chapter 173-340-360(3)(e) WAC, or those that will substantially affect the future planned business operations at the Property. Based on the screening, the FS presented below evaluates the most advantageous remediation technologies to recommend a final cleanup action for the Property in conformance with Chapters 173-340-360 through 173-340-370 WAC. The RI/FS portion of this report is intended to provide sufficient information to enable Ecology and the property owner to agree on the selection of a final cleanup action. Selection of the final cleanup action and details of its implementation are documented in the PCA section of this report. The cleanup action will be performed under a Consent Decree with Ecology.

This FS evaluates remediation technologies that will address COCs on the Property. The COCs include PAHs associated with the historical wood pipe treating operations performed at the Property, arsenic in soil within the Property boundaries, and arsenic-contaminated groundwater beneath the Property. These criteria constitute the Site as defined in Section 4.0 above.

5.1 CLEANUP STANDARDS

5.1.1 Applicable or Relevant and Appropriate Requirements

The selected cleanup alternative must comply with MTCA cleanup regulations specified in Chapter 173-340 WAC and with applicable state and federal laws. Under Chapters 173-340-350 and 173-340-710 WAC, applicable requirements 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 and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) define relevant and appropriate requirements as:

> those cleanup standards, standards of control, and other human health and environmental requirements, criteria, or limitations established under state or federal law that, while not applicable to the hazardous substance, cleanup action, location, or other circumstance at a site, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to a particular site.

The criteria used to make this determination are presented in Chapter 173-340-710(4)(a)-(i) WAC.

Remedial actions conducted under a consent decree with Ecology must comply with the substantive requirements of the applicable or relevant and appropriate requirements (ARARs) but are exempt from their procedural requirements (Chapter 173-340-710[9] WAC). 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.

5.1.1.1 Screening of ARARs

ARARs were screened in order to assess their applicability to the Former Wesmar Property. Only those that were deemed appropriate and applicable were retained as Remedial Action Objectives (RAOs). The following list identifies the ARARs that may be applicable to the Site.

- State Environmental Policy Act (Chapter 43.21C RCW).
- Washington State Shoreline Management Act (Chapter 90.58 RCW; Chapters 173-18, 173-22, and Chapter 173-27 WAC).
- The Clean Water Act (33 United States Code [USC] 1251 et seq.).
- CERCLA of 1980 (42 USC 9601 et seq. and Part 300 of Title 40 of the Code of Federal Regulations [40 CFR 300])
- The Fish and Wildlife Coordination Act.
- 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 (Chapter 27.44 RCW).
- Archaeological Resources Protection Act (16 USC 470aa et seq.; 43 CFR 7).
- Washington Dangerous Waste Regulations (Chapter 173-303 WAC).
- Solid Waste Management Act (Chapter 70.95 RCW; Chapters 173-304 and 173-351 WAC).
- Water Quality Standards for Surface Waters of the State of Washington (Chapters 90.48 and 90.54 RCW; Chapter 173-201A WAC).
- Department of Transportation Hazardous Materials Regulations (40 CFR Parts 100 through 185).
- Washington State Water Well Construction Act (Chapter 18.104 RCW; Chapter 173-160 WAC).
- City of Seattle and King County regulations, codes, and standards.

5.1.2 Development of Cleanup Standards

This section presents the proposed cleanup standards for the Site. MTCA Method A cleanup levels for unrestricted land uses have been previously used to identify those chemicals that warranted further study during the remedial investigation.

On-Property soil is compared to MTCA Method A cleanup levels for unrestricted land uses, which are sufficient to address the Property, as much of the subgrade soil will be removed prior to the construction of a belowground parking garage. Preliminary soil cleanup levels for arsenic will be based on unrestricted land use as defined in MTCA (20mg/kg). Soil cleanup levels for PAHs will be compared to the cleanup level established for benzo(a)pyrene (0.1 mg/kg). Using the toxicity equivalence methodology in Chapter 173-340-708(8) WAC, equivalent concentrations of the remaining PAHs, including benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene, will be calculated and summed to obtain the total toxicity soil concentration for the total cPAH mixture relative to the cleanup level for benzo(a)pyrene.

Because the Property is located within the North BINMIC area, the highest beneficial use of groundwater beneath the Property has been designated as surface water discharge; however, the groundwater is presumed to discharge to the Lake Washington Ship Canal, which is designated as domestic water under water supply uses according to WAC 173-201A§602. As a result, the MTCA Method A cleanup levels for potable groundwater (WAC 173-340-720) are applicable and are proposed as the Site-specific cleanup levels.

The table below presents the cleanup levels proposed for the Site remediation activities. Arsenic in soil and groundwater and benzo(a)pyrene (and associated TEFs) in soil are the COCs for the Site and will be addressed by the selected remedial alternative.

Cleanup Levels Proposed for Site Remediation Activities

COC	**Soil** (mg/kg)	**Groundwater** (µg/L)
Arsenic	20[a]	5[b]
Benzo(a)pyrene	0.1[a]	0.1[b]

[a] MTCA Cleanup Regulation 173-340-900, Table 740-1, Method A Soil Cleanup Levels for Unrestricted Land Uses.
[b] MTCA Cleanup Regulation 173-340-900, Table 720-1 Method A Cleanup Levels for Ground Water.
COC = chemical of concern
mg/kg = milligrams per kilogram
µg/L = micrograms per liter

In the event that additional contaminants are discovered during the course of the cleanup activities, their concentrations will be compared to the MTCA Method A cleanup levels for soil and groundwater.

5.1.3 Remedial Action Objectives

RAOs are general administrative goals for a cleanup action that address the overall MTCA cleanup process. The purpose of establishing RAOs for a site is to provide remedial alternatives that protect human health and the environment (Chapter 173-340-350 WAC). In addition, RAOs are designated in order to:

- Implement administrative principles for cleanup (Chapter 173-340-130 WAC);
- Meet the requirements, procedures, and expectations for conducting an FS and developing cleanup action alternatives as discussed in Chapters 173-340-350 through 173-340-370 WAC; and
- Develop cleanup levels (Chapters 173-340-700 through 173-340-760 WAC) and remedial alternatives that are protective of human health and the environment.

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

- Protect human health and the environment,
- Comply with cleanup levels,

- Comply with applicable state and federal laws, and
- Provide for compliance monitoring.

The key components for remediation of contaminated soil and groundwater at this Site include:

- Reduce concentrations of benzo(a)pyrene (and associated cPAH TEFs) in soil on the Property to below the MTCA Method A cleanup level for unrestricted land use (cleanup level) of 0.1 mg/kg to the extent practicable;
- Reduce concentrations of arsenic in soil on the Property to below the cleanup level of 20 mg/kg to the extent practicable;
- Mitigate exposure pathways to benzo(a)pyrene (and associated TEFs) in inaccessible, shallow soil remaining on and off of the Property that exceed the cleanup level to the extent practicable;
- Implement institutional controls on the Property to provide long-term maintenance of the risk management procedures in accordance with Chapter 173-340-440 WAC, which may include deed restrictions for soil and prohibiting the domestic use of groundwater beneath the Property;
- Reduce concentrations of arsenic in groundwater retained on the Property to below the MTCA Method A limit of 5 µg/L before discharging to the stormwater system;
- Provide for continued monitoring of groundwater and maintenance of engineering controls, if required; and
- Provide a construction contingency plan for handling potentially contaminated media during future off-Property utility work, as necessary.

Section 5.1.1 discusses ARARs for the cleanup actions at the Site, per the requirements specified under MTCA and applicable state and federal regulations.

5.2 EVALUATION OF TECHNOLOGIES

As part of this FS, SES evaluated remediation technologies for the Site with respect to the cleanup requirements set forth in MTCA. According to MTCA, a cleanup alternative must satisfy all of the following threshold criteria as specified in Chapter 173-340-360(2) WAC:

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

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

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

- Use permanent solutions to the maximum extent practicable,
- Provide for a reasonable restoration time frame, and
- Consider public concerns raised during public comment on the PCA.

In addition to the MTCA criteria discussed above, the future development plans were considered during technology screening. The development plans for the Property include excavation to a depth of approximately 20 feet below street grade surface and installation of a shoring system within the Property perimeter. The shoring system will extend to between 30 and 40 feet below the street grade surface. In order to address the two applicable pathways for exposure—human contact and leaching to groundwater—on-Property soil containing COCs in excess of their respective MTCA Method A cleanup levels will be excavated from within the construction footprint and disposed of off-Property prior to redevelopment. Because the remediation methods that will be used for the Site are significantly influenced by the construction excavation that will be completed within the shoring system, SES has designated three remedial areas on the Site: those portions of the Property that are located within the proposed shoring system (Area A), those portions of the Property that are located outside the shoring system (Area B), and the portion of the Site located within the Northwest 46th Street ROW (Area C) (Figure 11). The shoring locations were chosen for cost and logistical reasons associated with the constructability of the planned development and in coordination with the disproportionate cost analyses conducted as part of the FS. The remedial technologies are evaluated in Section 5.6 using the remedial action objectives described in Section 5.1.3 and the evaluation process criteria set forth in Chapter 173-340 360 (3)(f) WAC and defined below. Chapter 173-340 360 (3)(f) WAC establishes the criteria for conducting a disproportionate cost analysis to establish whether the cleanup action will be permanent to the maximum extent practicable.

Using the above criteria, several remedial technologies were evaluated to produce a short list for further evaluation. Table 7a presents the results of the screening matrix for Area A. Only excavation with shoring for source removal met all of the matrix criteria for soil remediation. Two possible technologies were identified for treatment of the excavated soil: (1) ex situ treatment using surfactant washing or (2) landfill disposal. Three technologies were identified for treatment of the arsenic-contaminated groundwater that may infiltrate the building footing drain system: (1) a permeable reactive barrier, (2) a subgrade treatment system, and (3) direct discharge to sewer.

Table 7b presents the results of the screening matrix for Area B. Only two technologies were retained for further evaluation: capping in place and excavation with shoring.

Table 7c presents the results of the screening matrix for Area C. Only two remedial technologies were retained for further evaluation: capping in place and excavation with shoring.

5.3 TREATABILITY STUDIES

As discussed in Section 4.1 and 5.1.2, the primary COCs for the Site are benzo(a)pyrene in soil and arsenic in groundwater. However, this does not preclude the consideration of other COCs that are co-mingled with the benzo(a)pyrene, such as other cPAHs. The secondary COC for the Property is arsenic. These compounds may require different treatment technologies because arsenic is a metal, which cannot be broken down into non-toxic compounds, and benzo(a)pyrene is a long-chain hydrocarbon, which is persistent but can be broken down into non-toxic compounds. Based on the different treatment technologies required for the COCs, Site-specific conditions, and the future development plans, the most likely cleanup approach for the Site will involve capping and/or excavation and off-Site disposal of affected soil.

Treatability studies were judged not to be appropriate when evaluating capping or excavation as remedial alternatives.

5.4 EVALUATION OF CLEANUP ALTERNATIVES

Tables 7a, 7b, and 7c present the full suite of remedial technologies that were considered as part of this feasibility study. Preliminary screening was performed using engineering judgment to assess the effectiveness of each technology in reducing Site risks using the criteria discussed below and summarized in Tables 7a, 7b, and 7c. Technologies that passed the preliminary screening were further qualitatively screened based generally on effectiveness, implementability, and cost.

The only technology to be eliminated from the short list developed from Tables 7a, 7b, and 7c is the ex-situ treatment of the soil using surfactant washing. Surfactant soil washing was not included in any of the final two combined alternatives because of the following reasons:

1. It would lead to uncertainty associated with the remediated soil that may require disposal off-Property as a result of the development needs;
2. It would not improve protectiveness, permanence, long-term effectiveness, or implementability compared to landfill disposal; and
3. It would result in $125 cost per cubic yard of soil treatment that was not favorable when compared to the Subtitle D landfill disposal rate of $55 per cubic yard.

5.5 ALTERNATIVE EVALUATION PROCESS

This section presents the evaluation of potentially feasible cleanup alternatives with respect to the RAOs established for the Site. Remedial technologies were identified per the requirements set forth in MTCA under Chapter 173-340-350(8)(b) WAC and the focused screening of potential remediation technologies using the requirements and procedures for selecting cleanup actions as set forth in MTCA under Chapter 173-340-360(2)(a)(b) WAC. The criteria used by SES to evaluate and compare applicable cleanup alternatives when conducting a disproportionate cost analysis were derived from Chapter 173-340-360(3)(f) WAC and include:

- **Protectiveness:** The overall protectiveness of human health and the environment, including the degree to which existing risks are reduced, the time required to reduce risk at the facility and attain cleanup standards, the on-Property risks resulting from implementing the alternative, and improvement of overall environmental quality of the Site.
- **Permanence:** The degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances, including the adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of the waste treatment process and the characteristics and quantity of treatment residuals generated during the treatment process.
- **Cost:** The cost to implement the alternative, including the cost of construction, the net present value of any long-term costs, and Ecology oversight costs. Long-term costs that were considered include those associated with operation and maintenance, monitoring, equipment replacement, and reporting and maintaining any institutional controls.
- **Effectiveness over the long term:** The degree of certainty that the alternative will be successful, the reliability of the alternative during the period of time over which hazardous substances are expected to remain on the Site, and the magnitude of residual risk associated with the contaminated soil and/or groundwater components, presented in descending order, may be used as a guide when assessing the relative degree of long-term effectiveness of the chosen alternative: reuse or recycling; destruction or detoxification; immobilization or solidification; on-Property or off-Property disposal in an engineered, lined and monitored facility; on-Property isolation or containment with attendant engineering controls; and institutional controls and monitoring.
- **Management of short-term risks:** The risk to human health and the environment associated with the alternative during its construction and implementation, and the effectiveness of measures that will be taken to manage such risks.

- **Technical and administrative implementability:** The ability to implement the alternative; includes consideration of the technical feasibility of the alternative, administrative and regulatory requirements, permitting, scheduling, size, complexity, monitoring requirements, access for construction operations and monitoring, and integration with the future development plans for the Property.
- **Consideration of public concerns:** The consideration of community concerns regarding the alternative and, if there are concerns, the extent to which the alternative addresses those concerns. This process includes concerns from individuals, community groups, local governments, federal and state agencies, or any other organization that may have an interest in or knowledge of the Site.

An initial screening of all potential remediation technologies typically applied to sites contaminated with benzo(a)pyrene and arsenic was performed by SES to eliminate technologies that did not meet the minimum requirements for protectiveness, permanence, implementability, and cost as described above. A number of remediation technologies were eliminated during the initial screening process as set forth in MTCA under Chapter 173-340-350(8)(b) WAC. These technologies and the evaluation process are documented in Table 7a (Area A), Table 7b (Area B), and Table 7c (Area C). SES also considered a “no action” alternative, but this did not meet the RAOs, protectiveness criteria, or permanence minimum requirements.

5.6 FOCUSED EVALUATION OF TREATMENT ALTERNATIVES

The focused evaluation of potential technically feasible cleanup alternatives considered all practicable remediation technologies confirmed to be effective at treating benzo(a)pyrene and its degradation compounds in the affected medium of concern. SES also considered whether Site-specific constraints may preclude application of a remediation technology due to the creation of a greater risk to human health and/or the environment, or that such constraints may result in substantial costs without proportional benefits of implementing that remediation technology.

The key assumptions used by SES in the focused evaluation of cleanup alternatives include the following:

- Benzo(a)pyrene and arsenic are valid indicators for the COCs at the Site and implementation of cleanup alternatives that are successful at meeting the cleanup objectives for benzo(a)pyrene and arsenic would also be successful for all other COCs on the Site.
- The distribution of benzo(a)pyrene and arsenic in soil as described in the SCM (Section 4) has been defined sufficiently to support the evaluation of potential remediation technologies.
- MTCA Method A unrestricted cleanup levels for soil and MTCA Method A cleanup levels for groundwater will be used as the target cleanup levels for COCs on the Site.
- Engineering controls may be required to mitigate the potential for soil direct contact and exposure to arsenic and PAHs around the perimeter of the Property and beyond the Property boundaries.
- Implementation of institutional controls on the Site would be necessary to provide long-term maintenance of the risk management procedures in accordance with Chapter 173-340-440 WAC. The institutional controls would include the inaccessible contaminated soil located immediately adjacent to the Property, deed restrictions for domestic use of groundwater beneath the Property, and continued maintenance of engineering controls, if required. In addition, a construction contingency plan would be developed to govern the handling of potentially contaminated media during future utility work, as necessary.

- The remediation technologies would need to be compatible with the planned redevelopment for the Property, which includes the excavation of soil to within 5 feet of the Property boundary and to approximately 5 feet above MSL.

5.6.1 Area A Remediation Technology Alternatives

Area A is defined by the limits of the arsenic- and PAH-contaminated soil located within the perimeter of the shoring system. Based on the key assumptions described above, the cumulative results of the previous subsurface investigations and the RI conducted on and immediately adjacent to the Property, as well as the incremental cost comparisons of similar alternatives, three cleanup alternatives were retained for further consideration. These cleanup alternatives include:

- Cleanup Alternative 1a—Impermeable wall shoring (secant or sealed sheet pile) combined with the excavation of the source area and discharge to the storm system of the water captured in the proposed subgrade water intrusion control system.
- Cleanup Alternative 2a—Permeable wall shoring (soldier pile or unsealed sheet pile) combined with excavation of the source area and installing a permeable reactive barrier to pre-treat the water captured in the proposed subgrade water intrusion control system.
- Cleanup Alternative 3a—Permeable wall shoring combined with excavation of the source area and installing a permanent system to treat the water captured in the proposed subgrade water intrusion control system.

Because arsenic has an extremely low vapor pressure, it does not lead to a vapor pathway source. Excavation of contaminated soil will eliminate the direct contact pathway, and groundwater migration is impeded by the presence of a waterproof shoring system and/or captured by the subgrade groundwater control system. Therefore, the pathways for arsenic and benzo(a)pyrene are addressed by these alternatives.

Cleanup Alternatives 1a through 3a meet the criteria under MTCA for protection of human health and the environment, compliance with cleanup standards, permanence of the remedy, and completion within a reasonable time frame. A description of the components of each cleanup alternative follows.

5.6.1.1 Cleanup Alternative 1a

Cleanup Alternative 1a includes a combination of remediation and construction technologies that will eliminate the highest concentrations of arsenic and PAHs in the source areas, eliminate the direct contact pathway, and provide a barrier to minimize the intrusion of the regional arsenic groundwater plume into the building's subgrade water intrusion control system. This alternative could be implemented in conjunction with the development of the Property and may reduce the effects from the regional arsenic source.

The excavation of soil containing arsenic and PAHs above the MTCA Method A Cleanup Level for unrestricted land uses from within Area A is shown on Figures 12 and 13. An impermeable shoring system will be installed around the perimeter of the Property prior to excavation. Upon installation of the shoring wall, the construction excavation will commence and is planned to extend to within 5 feet of the Property boundary and to depths of 5 to 10 feet below the fill/native soil interface. Because of the extent of the planned excavation, a majority of the remaining arsenic and PAH concentrations in soil are likely to be less than the laboratory detection limit. Any excavated soil containing more than 0.1

mg/kg benzo(a)pyrene or more than 20 mg/kg arsenic will be disposed of in a Subtitle D Landfill.

Following completion of the excavation, confirmation soil sampling would be performed to confirm that the remediation objectives have been attained for soil within the development excavation area. The criteria for compliance soil sampling, including the depths and frequency of sampling, would be finalized in the PCA.

Groundwater monitoring in 2006 and 2007 has documented that the Site is in compliance with the MTCA Method A Cleanup Level for PAHs in groundwater. Since benzo(a)pyrene is not volatile enough to lead to a vapor pathway source, the only pathway that needs to be addressed for soil is direct contact. Excavation to the shoring wall will eliminate the direct contact pathway.

This alternative consists of installing a watertight shoring wall that extends approximately 30 to 40 feet below the street surface grade and approximately 20 feet below the soil/groundwater interface. It is unlikely that any of the regional arsenic groundwater plume will infiltrate into the permanent subgrade water intrusion control system that is proposed to be installed beneath the building (Figure 14). Water collected in the subgrade water intrusion control system will be discharged to the storm system. The discharge from the building subgrade water intrusion control system will be sampled for total arsenic on a quarterly basis during the first year, semiannually during the second and third years, and annually during the fourth and fifth years.

In the event that treatment of water discharging from the subgrade water intrusion control system is required to remove elevated concentrations of arsenic, a filtration unit, as conceptualized below, will be added to the system. Specific design parameters will be evaluated during the construction dewatering process to accurately size the treatment system and verify the treatment method. Using preliminary information and data collected from the Site, a conceptual treatment system would consist of the following components:

- Two high-pressure sump pumps,
- Two zero-valent iron filters,
- One backwash storage tank, and
- A safety control system with automatic backwash timer.

The two high-pressure sump pumps will be used as redundant coverage to remove the water from the building’s dewatering system. From the high-pressure sump pumps the water will be treated by two zero-valent iron filters running in series. By running the filters in series, the system provides additional redundancy. Therefore sampling will be completed between the filters, and no storage tank will be required for discharge to the storm system. The filters will be back-flushed periodically (timing will be determined in the field), to reduce the back pressure of the filters. Back-flush water will be stored in the backwash storage tank and then run through the two filters prior to discharge to the storm system. Accumulated solids in the backwash tank will be removed periodically as needed.

Zero-valent iron treatment relies on iron corrosion, reprecipitation, and arsenic adsorption on the external surface of the adsorbent (arsenic adsorbs to the iron). Zero-valent iron filters have been used to reduce arsenic concentrations from 20 milligrams per liter to less than 10 µg/L arsenic. The project goal will be to reduce the arsenic concentration to below 5 µg/L. The projected design life of the filter would be 5 years. Depending on the influent concentration, the life cycle could exceed 20 years. Spent zero-valent iron/sand mixture can be removed and replaced with new material.

The initial construction dewatering of the excavation may require pre-treatment of the water for turbidity and arsenic. Water that collects within the excavation during construction will be pumped into holding tanks, sampled, and treated as described above, if necessary, to confirm that groundwater cleanup standards are met prior to discharge to the storm system. It is anticipated that a stormwater discharge permit will be required by the City of Seattle.

Key assumptions for this component of the proposed cleanup action include the following:

- Shoring costs are borne by the development and are not included in the disproportionate cost analysis.
- Concentrations of PAHs in groundwater do not exceed MTCA Method A cleanup levels as a result of excavation activities. Compliance groundwater monitoring will be conducted at select locations during construction and excavation.
- Implementation of institutional controls may occur on the Property for long-term maintenance of the risk management procedures in accordance with Chapter 173-340-440 WAC. Applicable institutional controls may include placing deed restrictions on soil beneath the Property, prohibiting the domestic use of groundwater beneath the Property, and providing for continued monitoring and maintenance of engineering controls, if any are required. In addition, a construction contingency plan would be developed to govern the handling of potentially contaminated media during future redevelopment, as necessary.

A preliminary estimate of the cost to complete Cleanup Alternative 1 indicates that the cost ranges from approximately $1,625,000 to $2,437,000 (Table 9a, Chart 1). These costs assume that 27,300T tons of soil will require disposal in a Subtitle D landfill facility, engineering controls will be permanent and require minimal maintenance, and the shoring wall is watertight.

The criteria used by SES to qualitatively evaluate Alternative 1a are presented below and summarized in Table 8a.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 1a is high. The arsenic- and PAH-contaminated soil will be excavated and disposed of off-Property, leaving clean, native glacial till. The impermeable shoring wall restricts the off-Property arsenic-contaminated groundwater from flowing onto the Property. These combined actions significantly reduce the environmental risks to the Property.

Permanence. The degree to which Alternative 1a permanently reduces the toxicity is high. The contaminated soil is removed from the Property; therefore, the remediation is irreversible, reduces the toxicity, and eliminates the future possibility of hazardous substance releases. The contaminated soil will be sequestered in a landfill, which mitigates the risk to human health and the environment.

Cost. The cost to implement Alternative 1a is advantageous, given the Property redevelopment plans. Because redevelopment of the Property includes the construction of an underground parking lot, all shoring and excavation costs are associated with the development expenses. The remediation costs include only the incremental cost of disposal in a permitted landfill. Long-term costs, including those associated with operation and maintenance, monitoring, equipment replacement, reporting and maintaining any institutional controls, were lowest for Alternative 1a.

Effectiveness over the long term. Alternative 1a provides the maximum long-term effectiveness to minimize on-Property arsenic and PAH contamination. Since the contaminated soil will be removed from the Property, the long-term effectiveness is high.

Management of short-term risks. The risk to human health and the environment associated with Alternative 1a is minimal, but present in the form of dust migration during construction and excavation activities. This risk will be mitigated by wetting the top of the soil stockpiles and excavation areas to minimize dust production.

Technical and administrative implementability. Alternative 1a is implementable, technically feasible, permitable, and complies with development plans. In addition, the alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 1a is favorable in consideration of public concerns. The alternative requires the excavation of the source area, and the redevelopment project will convert low-cost, abandoned warehouse buildings into mixed-use office/retail development.

5.6.1.2 Cleanup Alternative 2a

Cleanup Alternative 2a includes a combination of remediation and construction technologies that will eliminate the highest concentrations of benzo(a)pyrene in the source areas, eliminate the direct contact pathway, and provide a barrier to minimize the intrusion of arsenic associated with the regional groundwater plume into the building subgrade groundwater control system. This alternative could be implemented in conjunction with the development of the Property and may reduce the regional arsenic source.

As with Cleanup Alternative 1a, the excavation of soil containing arsenic and PAHs above the MTCA Method A Cleanup Level for unrestricted land uses from within Area A is shown on Figures 12 and 13. Because of the extent of the planned excavation, a majority of the remaining arsenic and benzo(a)pyrene concentrations in soil are likely to be less than the laboratory detection limit. Any excavated soil containing more than 0.1 mg/kg benzo(a)pyrene or more than 20 mg/kg arsenic will be disposed of in a Subtitle D Landfill.

Following completion of the excavation, confirmation soil sampling would be performed to confirm that the remediation objectives have been attained for soil within the development excavation area. The criteria for compliance soil sampling, including the depths and frequency of sampling, are described in the PCA (Section 6.0).

As discussed above, Cleanup Alternative 2a has the same soil source removal efficiencies of Cleanup Alternative 1a, but it provides protection to the Property from the regional arsenic groundwater plume by implementing a permeable reactive barrier following excavation of PAH- and arsenic-contaminated soil. Permeable shoring, which does not isolate the shallow regional groundwater aquifer from the building subgrade water intrusion control system, will be installed in place of the impermeable shoring system (Figure 15). As a result, a reactive barrier will be required to remove the arsenic from the water that collects within the proposed building's subgrade water intrusion control system before disposal. Long-term monitoring of the discharge water from the system would be required to evaluate the effectiveness of the barrier. This alternative could be implemented in conjunction with the development of the Property and may provide a reduction of the regional arsenic source.

The permeable reactive barrier would consist of a mix of sand and zero-valent iron shavings. The iron attracts the arsenic, pulling it out of the water column and sequestering it within the permeable barrier. The sand is used to increase the permeability of the barrier and to prevent blinding. In addition, the sand acts as a filler to separate the sequestered arsenic and to help prevent the buildup of arsenic over time.

The initial construction dewatering of the excavation may require pre-treatment of the water for turbidity and arsenic. Water collected within the excavation during construction will be pumped into holding tanks and sampled to confirm that groundwater standards are met prior to discharge to the storm system. It is anticipated that a stormwater discharge permit will be required by King County and the City of Seattle.

Key assumptions for this component of the proposed cleanup action include the following:

- Shoring costs are borne by the development and are not included in the disproportionate cost analysis.
- Concentrations of benzo(a)pyrene in groundwater do not exceed MTCA Method A cleanup levels as a result of excavation activities. Compliance groundwater monitoring will be conducted at select locations during construction and excavation.
- Implementation of institutional controls may occur on the Property for long-term maintenance of the risk management procedures in accordance with Chapter 173-340-440 WAC. Applicable institutional controls may include placing deed restrictions on soil beneath the Property, prohibiting the domestic use of groundwater beneath the Property, and providing for continued monitoring and maintenance of engineering controls, if any are required. In addition, a construction contingency plan would be developed to govern the handling of potentially contaminated media during future redevelopment, as necessary.
- The permeable reactive barrier will be permanent (i.e., it will have a useful life of greater than 50 years) and will not require maintenance. A contingency plan for an active treatment system as described below in Alternative 3a would be necessary to implement if breakthrough of the barrier occurs.

A preliminary estimate of the cost to complete Cleanup Alternative 2a indicates that the cost ranges from approximately $2,670,000 to $3,337,000 (Table 9b, Chart 1). These costs assume that 27,300 tons of soil will require disposal in a Subtitle D landfill facility, engineering controls will be permanent, the system will require minimal maintenance, and the permeable reactive barrier works in perpetuity.

The criteria used by SES to qualitatively evaluate Alternative 2a are presented below and summarized in Table 8a.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 2a is high. The arsenic- and PAH-contaminated soil will be excavated and disposed of off-Property, leaving clean, native glacial till. The permeable shoring wall restricts the off-Property arsenic-contaminated groundwater from flowing onto the Property. These combined actions significantly reduce the environmental risks for the Property.

Permanence. The degree to which Alternative 2a permanently reduces the toxicity is high. The contaminated soil is removed from the Property; therefore, the remediation is irreversible, reduces the toxicity, and eliminates the future possibility of hazardous substance releases. The contaminated soil will be sequestered in a landfill, which mitigates the risk to human health and the environment.

Cost. The cost to implement Alternative 2a is more expensive than Alternative 1a. Because redevelopment of the Property includes the construction of an underground parking lot, all shoring and excavation costs are associated with the development expenses. The remediation costs only include the incremental cost of disposal in a permitted land fill. Long-term costs, including those associated with operation and maintenance, monitoring, equipment replacement, reporting and maintaining any institutional controls, were $1,000,000 more for Alternative 2a than Alternative 1a.

Effectiveness over the long term. Alternative 2a provides the maximum long-term effectiveness to minimize on-Property arsenic and PAH contamination. Since the contaminated soil will be removed from the Property, the long-term effectiveness is high. However, because the permeable shoring wall allows the off-Property arsenic-contaminated groundwater flow into the proposed subgrade groundwater intrusion control system through a reactive barrier wall, the long-term effectiveness of the alternative relative to groundwater quality is average.

Management of short-term risks. The risk to human health and the environment associated with Alternative 2a is minimal but present in the form of dust migration during construction and excavation activities. This risk will be mitigated by wetting the top of the soil stockpiles and excavation areas to minimize dust production.

Technical and administrative implementability. Alternative 2a is implementable, technically feasible, permitable, and complies with development plans. In addition, the alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 2a is favorable in consideration of public concerns. The alternative requires the excavation of the source area, and the redevelopment project will convert low-cost, abandoned warehouse buildings into mixed-use office/retail development.

5.6.1.3 Cleanup Alternative 3a

Cleanup Alternative 3a includes a combination of remediation and construction technologies that will eliminate the highest concentrations of arsenic and benzo(a)pyrene in the source areas, eliminate the direct contact pathway, and pre-treat arsenic-contaminated groundwater that migrates into the buildings subgrade water intrusion control system.

As with Cleanup Alternatives 1a and 2a, the excavation of soil containing arsenic and PAHs above the MTCA Method A Cleanup Level for unrestricted land uses from within Area A is shown on Figures 12 and 13. Because of the extent of the planned excavation, a majority of the remaining arsenic and benzo(a)pyrene concentrations in soil are likely to be less than the laboratory detection limit. Any excavated soil containing more than 0.1 mg/kg benzo(a)pyrene or more than 20 mg/kg arsenic will be disposed of in a Subtitle D Landfill.

Following completion of the excavation, confirmation soil sampling would be performed to confirm that the remediation objectives have been attained for soil within the development excavation area. The criteria for compliance soil sampling, including the depths and frequency of sampling, are described in the PCA (Section 6.0).

Cleanup Alternative 3a has the same soil source removal efficiencies of Cleanup Alternatives 1a and 2a, but it provides protection from the regional arsenic groundwater plume by implementing a permanent arsenic treatment system following excavation. Permeable soldier pile shoring, which does not isolate the shallow regional groundwater aquifer from the building subgrade water intrusion control system, will be installed in place of the secant shoring system. As a result, a permanent arsenic treatment system will be required to remove the arsenic that collects within the proposed building's subgrade water intrusion control system (Figure 16). This alternative could be implemented in conjunction with the development of the Property, and it may reduce the regional arsenic source.

The permanent arsenic treatment system would consist of a high-pressure water pump and a filter containing sand and zero-valent iron. The high pressure pump would direct the water collected in the building subgrade groundwater control system through a sand and iron filter that removes the arsenic prior to discharging the treated water to the storm system.

The initial construction dewatering of the excavation may require pre-treatment of the water for turbidity and arsenic. Water collected within the excavation during construction will be pumped into holding tanks and sampled to confirm that groundwater standards are met prior to discharge to the storm system. It is anticipated that a stormwater discharge permit will be required by King County and the City of Seattle.

Key assumptions for this component of the proposed cleanup action include the following:

- Shoring costs are borne by the development and are not included in the disproportionate cost analysis.
- Concentrations of benzo(a)pyrene in groundwater do not exceed MTCA Method A cleanup levels as a result of excavation activities. Compliance groundwater monitoring will be conducted at select locations during construction and excavation.
- Implementation of institutional controls may occur on the Property for long term-maintenance of the risk management procedures in accordance with Chapter 173-340-440 WAC. Applicable institutional controls may include placing deed restrictions on soil beneath the Property, prohibiting the domestic use of groundwater beneath the Property, and providing for continued monitoring and maintenance of engineering controls, if any are required. In addition, a construction contingency plan would be developed to govern the handling of potentially contaminated media during future redevelopment, as necessary.
- The treatment system will require long-term operation and maintenance.

A preliminary estimate of the cost to complete Cleanup Alternative 3a indicates that the cost ranges from approximately $2,715,000 to $3,394,000 (Table 9c, Chart 1). These costs assume that 27,300 tons of soil will require disposal in a Subtitle D landfill facility, engineering controls will be permanent and require minimal maintenance.

The criteria used by SES to qualitatively evaluate Alternative 3a are presented below and summarized in Table 8a.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 3a is high. The arsenic- and PAH-contaminated soil will be excavated and disposed of off-Property, leaving clean, native glacial till. The impermeable shoring wall restricts the off-Property arsenic-contaminated groundwater from flowing onto the Property. These combined actions significantly reduce the environmental risks for the Property.

Permanence. The degree to which Alternative 3a permanently reduces the toxicity is high. The contaminated soil is removed from the Property; therefore, the remediation is irreversible, reduces the toxicity, and eliminates the future possibility of hazardous substance releases. The contaminated soil will be sequestered in a landfill, which mitigates the risk to human health and the environment.

Cost. The cost to implement Alternative 3a is more expensive than Alternative 1a. Because redevelopment of the Property includes the construction of an underground parking lot, all shoring and excavation costs are associated with the development expenses. The remediation costs only include the incremental cost of disposal in a permitted land fill. Long-term costs, including those associated with operation and maintenance, monitoring, equipment replacement, reporting and maintaining any institutional controls were $1,000,000 more for Alternative 3a than Alternative 1a.

Effectiveness over the long term. Alternative 3a provides the maximum long-term effectiveness to minimize on-Property arsenic and PAH contamination. Since the contaminated soil will be removed from the Property, the long-term effectiveness is high. Because the permeable shoring wall allows the off-site arsenic-contaminated water to flow into the subgrade water treatment system, the long-term effectiveness of the alternative in regards to groundwater quality is average.

Management of short-term risks. The risk to human health and the environment associated with Alternative 3a is minimal but present in the form of dust migration during construction and excavation activities. This risk will be mitigated by wetting the top of the soil stockpiles and excavation areas to minimize dust production.

Technical and administrative implementability. Alternative 3a is implementable, technically feasible, permitable, and complies with development plans. In addition, the alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 3a is favorable in consideration of public concerns. The alternative requires the excavation of the source area, and the redevelopment project will convert low-cost, abandoned warehouse buildings into mixed-use office/retail development.

5.6.2 Area B Remediation Technology Alternatives

Area B is defined by the extent of arsenic- and PAH-contaminated soil located within the Property boundary but beyond the perimeter of the shoring system (Figure 11). Based on the key assumptions from Section 5.6, the cumulative results of the previous subsurface investigations and the RI conducted on and immediately adjacent to the Property, as well as the incremental cost comparisons of similar alternatives, two cleanup alternatives were retained for further consideration. These cleanup alternatives include:

- Cleanup Alternative 1b—Shored excavation with off-Property disposal.
- Cleanup Alternative 2b—Capping arsenic- and PAH-contaminated soil.

Groundwater monitoring activities conducted in 2006 and 2007 have documented that the Site is in compliance with the MTCA Method A Cleanup Level for unrestricted land uses for benzo(a)pyrene in groundwater. Since benzo(a)pyrene is not volatile enough to lead to a vapor pathway source and no groundwater impacts have been detected, the only pathway that needs to be addressed is direct contact with contaminated soil.

Both of the cleanup alternatives meet the criteria under MTCA for protection of human health and the environment, compliance with cleanup standards, permanence of the remedy, and completion within a reasonable time frame. The implementation of these alternatives likely would not result in public concern. A description of the components of each cleanup alternative follows.

5.6.2.1 Cleanup Alternative 1b

Cleanup Alternative 1b includes a combination of remediation and construction technologies that will eliminate the highest concentrations of arsenic and benzo(a)pyrene in the source areas and will eliminate the direct contact pathway.

The excavation of soil containing arsenic and PAHs above the MTCA Method A Cleanup Level for unrestricted land uses from Area B is shown on Figures 12 and 13. A shoring system will be installed outside of the impermeable shoring to protect the structural stability of the adjacent ROW and nearby utilities (Figure 17). Any excavated soil containing more than 20 mg/kg arsenic or 0.1 mg/kg benzo(a)pyrene or equivalent will be disposed of in a Subtitle D Landfill.

Following completion of the excavation, compliance soil sampling would be performed to confirm that the remediation objectives have been attained for soil within the excavation area. The criteria for compliance soil sampling, including the depths and frequency of sampling, are described in the PCA (Section 6.0).

Key assumptions for this component of the cleanup action include the following:

- Shoring costs, excavation, and backfill are included in the cost analysis.
- Excavation is limited to Area B as depicted on Figure 11, representing approximately 6,500 cubic yards of soil.
- Concentrations of benzo(a)pyrene in groundwater do not exceed MTCA Method A cleanup levels as a result of excavation activities. Compliance groundwater monitoring will be conducted at select locations during construction and excavation.

A preliminary estimate of the cost to complete Cleanup Alternative 1b indicates that the cost ranges from approximately $1,900,000 to $2,200,000 (Table 9d, Chart 2). These costs assume that 6,500 cubic yards, or 8,000 tons, of soil will require disposal in a Subtitle D landfill facility; 1,200 linear feet of shoring will be required to protect the stability of surrounding structures; engineering controls will be permanent and require minimal maintenance; and the net present worth is based on 7% discounted rate of money with a 2% annual escalation in operation and maintenance costs.

The criteria used by SES to qualitatively evaluate Alternative 1b are presented below and summarized in Table 8b.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 1b is high. The arsenic- and PAH-contaminated soil will be excavated and disposed of off-Property, leaving clean, native glacial till.

Permanence. The degree to which Alternative 1b permanently reduces the toxicity is high. The contaminated soil is removed from the Property; therefore, the remediation is irreversible, reduces the toxicity, and eliminates the future possibility of hazardous substance releases. The contaminated soil will be sequestered in a landfill, which mitigates the risk to human health and the environment.

Cost. The cost to implement Alternative 1b is the most expensive alternative for the Area B soil. The net present value of any long-term costs and Ecology oversight costs that were considered when excavating all arsenic- and PAH-contaminated soil associated with activities conducted on the Property, including those associated with operation and maintenance, monitoring, equipment replacement, reporting, and maintaining any institutional controls, were two orders of magnitude above that for Alternative 2b. Because the costs are disproportionate relative to the reduction of risk, Alternative 1b received a low rating for cost.

Effectiveness over the long term. Alternative 1b provides the maximum long-term effectiveness to minimize impacts to the Site as a result of excavating arsenic- and PAH-contaminated soil from Area B. Since the contaminated soil will be removed from the Site, the long-term effectiveness is high.

Management of short-term risks. The risk to human health and the environment associated with Alternative 1b is minimal but present in the form of dust migration during construction and excavation activities. This risk will be mitigated by wetting the top of the soil stockpiles and excavation areas to minimize dust production.

Technical and administrative implementability. Alternative 1b is problematic from an implementable, technically feasible, and permitable standpoint. The alternative requires a secondary shoring system to protect the utilities in the street and results in significant issues associated with permitting and excavating around public utilities located within the ROW. However, the alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 1b is favorable in consideration of public concerns. The alternative requires the excavation of the source area, and the redevelopment project will convert low-cost, abandoned warehouse buildings into mixed-use office/retail development.

5.6.2.2 Cleanup Alternative 2b

Cleanup Alternative 2b requires the use of capping and institutional control to eliminate the direct contact pathway for human and ecological exposure (Figures 12, 13, 18, 20 and 21).

Key assumptions for this component of the cleanup action include the following:

- Excavation and backfill in the area for utilities is covered by the development costs and are not included in the cost analysis.
- Any excavation is limited to utility maintenance and construction only and is assumed to include no more than approximately 300 cubic yards of contaminated soil.

- The incremental cost for Subtitle D soil disposal is included in remediation costs.
- Implementation of institutional controls will occur on the area to provide long-term maintenance of the risk management procedures in accordance with Chapter 173-340-440 WAC. Applicable institutional controls will include placing deed restrictions on soil beneath the area, prohibiting the domestic use of groundwater beneath the Site, and providing for continued monitoring and maintenance of engineering controls, if any are required. In addition, a construction contingency plan would be developed to govern the handling of potentially contaminated media during future redevelopment, as necessary.

A preliminary estimate of the cost to complete Cleanup Alternative 2b indicates that the cost ranges from approximately $22,000 to $44,000 (Table 9e and Chart 2). These costs assume that 300 tons of soil will require disposal in a Subtitle D landfill facility, a construction contingency plan will be prepared, engineering controls will be permanent and require minimal maintenance, and the net present worth is based on 7% discounted rate of money with a 2% annual escalation in operation and maintenance costs.

The criteria used by SES to qualitatively evaluate Alternative 2b are presented below and summarized in Table 8b.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 2b is high. Groundwater sampling has shown that groundwater in the vicinity of Area B has not had concentrations of cPAHs in excess of applicable cleanup levels. Therefore, the active pathway that impacts human health and the environment is direct contact, which will be mitigated by capping. The addition of an institutional control limiting future access to the PAHs within Area B and providing instructions for regulatory notification, waste handling, and disposal profiling will result in a high degree of protectiveness for the general public.

Cost. The cost to implement Alternative 2b is the lowest for the alternatives proposed to address arsenic- and PAH-contaminated soil within Area B. Long-term costs that were considered, including those associated with operation and maintenance, monitoring, equipment replacement, reporting, and maintaining any institutional controls, were two orders of magnitude less than those associated with Alternative 1b. Alternative 2b receives a preferred rating for cost.

Effectiveness over the long term. Alternative 2b provides an average to high long-term effectiveness to minimize exposure to on-Property arsenic and PAH contamination in soil.

Management of short-term risks. The risk to human health and the environment associated with Alternative 2b is very low. Implementation of the cap does not disturb the contaminated soil, thereby limiting short-term risks.

Technical and administrative implementability. Alternative 2b is preferred from an implementable, technically feasible, and permitable standpoint. The alternative fits with the development plans for new sidewalk improvements and existing asphalt road coverings that will create a barrier to direct contact. The alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 2b is average in regard to consideration of public concerns. The contamination will remain in place, but it will be capped to prevent direct contact.

5.6.3 Area C Remediation Technology Alternatives

Area C is defined by the limits of the PAH-contaminated soil located within the Northwest 46th Street ROW (Figure 11). Based on key assumptions described above, the cumulative results of the previous subsurface investigations, and the RI conducted on and immediately adjacent to the Property, as well as the incremental cost comparisons of similar alternatives, two cleanup alternatives were retained for further consideration. These cleanup alternatives include:

- Cleanup Alternative 1c—Shored excavation with off-Site disposal.
- Cleanup Alternative 2c—Capping PAH-contaminated soil.

Both capping and excavation of contaminated soil will eliminate the direct contact pathway, and the groundwater pathway has been confirmed to be incomplete.

Cleanup Alternatives 1c and 2c meet the criteria under MTCA for protection of human health and the environment, compliance with cleanup standards, permanence of the remedy, and completion within a reasonable time frame. A description of the components of each cleanup alternative follows.

5.6.3.1 Cleanup Alternative 1c

Cleanup Alternative 1c includes a combination of remediation and construction technologies that will eliminate the highest concentrations of benzo(a)pyrene in the source areas and will eliminate the direct contact pathway.

The excavation of soil containing PAHs above the MTCA Method A Cleanup Level for unrestricted land uses of 0.1 mg/kg from Area C is shown on Figure 13. A temporary shoring system will be installed outside of the impermeable shoring to protect the structural stability of the ROW and overlying utilities (Figure 19). Any excavated soil containing more than 0.1 mg/kg benzo(a)pyrene or equivalent will be disposed of in a Subtitle D Landfill.

Following completion of the excavation, compliance soil sampling would be performed to confirm that the remediation objectives have been attained for soil within the excavation area. The criteria for compliance soil sampling, including the depths and frequency of sampling, are described in the PCA.

Key assumptions for this component of the cleanup action include the following:

- Shoring, excavation, backfill, and permitting costs are included in the cost analysis.
- Excavation is limited to Area C as depicted on Figures 11 and 13, representing approximately 18 cubic yards of PAH-contaminated soil and approximately 470 cubic yards of overburden soil.
- Concentrations of benzo(a)pyrene in groundwater do not exceed MTCA Method A cleanup levels as a result of excavation activities. Compliance groundwater monitoring will be conducted at select locations during construction and excavation.
- Disposal of 18 cubic yards of soil in a Subtitle D landfill facility will be required.
- Demolishing of the Northwest 46th Street surface and sidewalk will be required.

- 1,500 square feet of shoring to protect the stability of surrounding ROW and adjacent structures will be required.
- Shoring for the high-pressure gas main as required.
- Removal and disposal of clean overburden as required.
- Backfilled materials will require acquisition placement and compaction.
- Reconstruction of Northwest 46th Street ROW as required.
- Traffic closures during excavation and construction activities within the Northwest 46th Street ROW as required.
- Permit coordination through the DPD, Seattle Department of Transportation, Seattle Public Utilities, and Puget Sound Energy will be required.

A preliminary estimate of the cost to complete Cleanup Alternative 1c indicates that the cost ranges from approximately $732,000 to $878,000 (Table 9f, Chart 3). The criteria used by SES to qualitatively evaluate Alternative 1c are presented below and summarized in Table 8c.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 1c is high. The PAH-contaminated soil will be excavated and disposed of off-Site, leaving clean, native glacial till.

Permanence. The degree to which Alternative 1c permanently reduces the toxicity is high. The contaminated soil is removed from the Property; therefore, the remediation is irreversible, reduces the toxicity, and eliminates the future possibility of hazardous substance releases. The contaminated soil will be sequestered in a landfill, which mitigates the risk to human health and the environment.

Cost. The cost to implement Alternative 1c is the most expensive alternative for the Area C soil. The net present value of any long-term costs and Ecology oversight costs that were considered when excavating all PAH-contaminated soil associated with activities conducted on the Property, including those associated with operation and maintenance, monitoring, equipment replacement, and reporting were well above that for Alternative 2c. Because the costs are disproportionate to the reduction of risk, Alternative 1c received a low rating for cost.

Effectiveness over the long term. Alternative 1c provides the maximum long-term effectiveness to minimize impacts to the Site as a result of excavating PAH-contaminated soil from Area C. Since the contaminated soil will be removed from the Site, the long-term effectiveness is high.

Management of short-term risks. The risk to human health and the environment associated with Alternative 1c is minimal but present in the form of dust migration and direct contact during construction and excavation activities. This risk will be mitigated by wetting the excavation areas to minimize dust production and requiring construction personnel to have current 40-hour Hazardous Waste Operations and Emergency Response Standard training.

Technical and administrative implementability. Alternative 1c is problematic from an implementable, technically feasible, and permitable standpoint. The City of Seattle has expressed concerns with excavation in the ROW and is concerned with the protection of existing utilities and the structural integrity of the roads and sidewalks. The alternative requires a secondary shoring system to protect the utilities in the street and results in significant issues in terms of permitting and excavating around public utilities located within the ROW. However, the alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 1c is favorable in consideration of long-term public concerns; however, excavating within the Northwest 46th Street ROW will require closing the street for an unknown period of time to allow shoring of the surrounding ROWs and structures, shoring of utilities, and excavation of clean overburden and PAH-contaminated soil prior to reconstruction of the Northwest 46th Street ROW. As a result, traffic congestion will increase on surrounding roads for the duration of the project.

5.6.3.2 Cleanup Alternative 2c

Cleanup Alternative 2c includes capping the ROW and implementing an environmental covenant from 6 feet below the ROW surface to a depth below the PAH contamination to eliminate the direct contact pathway for the maintenance and installation of deep utilities (Figures 11, 20, and 21A).

Key assumptions for this component of the cleanup action include the following:

- Approximately 6 feet of non-PAH-contaminated soil overlying the PAH contamination will serve as a barrier to minimize the potential for direct contact with the PAH-contaminated soil when shallow utility or ROW improvement work is conducted above the restricted area.
- Existing and improved ROW features, including asphalt-paved traffic lanes, parking strips, concrete sidewalks, and approximately 11 feet of clean soil overlying the PAH-contaminated soil will serve as a barrier to minimize the potential for direct contact for the general public.
- Implementation of institutional controls will occur on the area to provide long-term maintenance of the risk management procedures outlined in Chapter 173-340-440 WAC. Applicable institutional controls will include placing environmental covenants on soil beneath the area from 6 feet beneath the ROW surface to a depth below the PAH contamination, prohibiting the domestic use of groundwater beneath the Site, and providing for continued monitoring and maintenance of engineering controls, if any are required.

A preliminary estimate of the cost to complete Cleanup Alternative 2c indicates that the cost ranges from approximately $2,500 to $4,000 (Table 9g, Chart 3) These costs assume engineering controls will be permanent and require minimal maintenance.

The criteria used by SES to qualitatively evaluate Alternative 2c are presented below and summarized in Table 8c.

Protectiveness. Overall protectiveness of human health and the environment for Alternative 2c is high. Groundwater sampling has shown that groundwater in the vicinity of Area C (MW14) does not contain concentrations of PAHs in excess of applicable cleanup levels. Therefore, the active pathway that impacts human health and the environment is direct contact, which will be mitigated by capping. The contamination is located below the major utility corridor (surface to 6 feet bgs) and would not be disturbed during routine maintenance of shallow utilities and street improvement projects. SES has expanded the preliminary assessment of risk for the PAH-contaminated soil as it relates to potential future access for the installation of deep utilities or deep ROW improvement projects (Section 4.7.2). The risk assessment indicates that the PAH concentrations in the soil within the

ROW do not represent a direct exposure hazard to the general public or construction/utility workers who may come into contact with it. The addition of an institutional control limiting future access to the PAHs within the ROW and providing instructions for regulatory notification, waste handling, and disposal profiling will result in a high degree of protectiveness for the general public.

Cost. The cost to implement Alternative 2c is the lowest of the alternatives proposed to address PAH-contaminated soil within Area C. Long-term costs that were considered, including those associated with operation and maintenance, monitoring, equipment replacement, reporting, and maintaining any institutional controls, were well below those associated with Alternative 1c. Alternative 2c receives a preferred rating for cost.

Effectiveness over the long term. Alternative 2c provides an average to high long-term effectiveness to minimize exposure to off-Property PAH contamination in soil.

Management of short-term risks. The risk to human health and the environment associated with Alternative 2c is very low. Implementation of the cap does not disturb the contaminated soil, thereby limiting short-term risks.

Technical and administrative implementability. Alternative 2c is preferred from an implementable, technically feasible, and permitable standpoint. The alternative fits with the development plans for new sidewalk improvements and existing asphalt road coverings that will enhance the barrier to direct contact. Alternative 2c also satisfies the City of Seattle's concerns with excavation in the ROW and the protection of existing utilities and the structural integrity of the roads and sidewalks. The alternative satisfies all applicable requirements set forth in MTCA.

Consideration of public concerns. Alternative 2c is average in regards to consideration of public concerns. The contamination will remain in place, but it will be capped and placed under institutional control to prevent direct contact. In addition, street closure or disruption to utilities would not be required to implement Alternative 2c.

5.7 RECOMMENDED CLEANUP ALTERNATIVE

Based on the results of the feasibility study, a combination of Cleanup Alternatives 1a, 2b, and 2c, which entail installing an impermeable shoring wall, excavating contaminated soil from within Area A, capping contaminated soil within Areas B and C, and monitoring the direct discharge of arsenic-contaminated groundwater within the building subgrade groundwater intrusion control system, will be applied during Site remediation. The evaluation of Cleanup Alternatives 1a through 2c using the criteria presented in MTCA is summarized in Tables 8a, 8b, and 8c. Because the nature of the scoring is qualitative and the evaluation criteria are not equivalent, the ranking of cleanup alternatives is not based on a simplistic mathematical summing of the scores to identify the preferred alternative. The selection of a recommended cleanup alternative considers the scoring, but it ultimately is determined by professional judgment. Alternative 1a has similar or less risk associated with the cleanup than Alternatives 2a, or 3a, and is considerably less costly (Tables 9a through 9c, Chart 1). When comparing Alternatives 1b and 2b, the risk is higher with Alternative 2b. However, as indicated on Chart 2, the costs associated with Alternative 1b are disproportionately high when compared to the costs associated with Alternative 2b (Tables 9d and 9e; Chart 2). Similarly, when comparing Alternatives 1c and 2c, the risk is higher with Alternative 2c. However, as indicated on Chart 3, the costs associated with Alternative 1c are disproportionately high when compared to the costs associated with Alternative 2c (Table 9f and 9g; Chart 3).

Cleanup Alternatives 1a, 2b, and 2c meet the requirements set forth in Chapters 173-340-360(3) and 173-340-370 WAC. These cleanup alternatives received “favorable” scores for the evaluation criteria of protectiveness, permanence, cost, long-term effectiveness, implementability, and consideration of public concern. The rating of “average” was assigned for short-term risk management, as a result of possible dust issues associated with the excavation. The rating of “favorable” was assigned for implementation because the impermeable (or impermeable) secant wall creates a physical barrier that reduces the likelihood that the regional arsenic groundwater plume will migrate beyond the boundary of the shoring barrier on the Property, while the other two alternatives rely on treatment systems. Cleanup Alternatives 1a, 2b, and 2c received “very favorable” overall scores for the evaluation criteria of cost due to the significant cost savings over Alternatives 2a, 3a, 1b, and 1c (Tables 9a though 9g; Charts 1 through 3).

Details concerning the implementation of the recommended cleanup alternative and the decision process used to evaluate whether modifications to the selected approach are warranted are provided in the PCA, discussed below.

6.0 PROPOSED CLEANUP ACTION

The results of subsurface investigations conducted on and adjoining the Property between September 2005 and August 2008 indicate that PAH-contaminated soil and arsenic-contaminated soil and groundwater are present beneath the Site.

Field activities undertaken between 2005 and 2008 included:

- The collection of 11 railroad ballast samples;
- The advancement of 37 push-probe soil borings to evaluate the extent of soil contamination beneath and adjacent to the Property; and
- The advancement of 25 hollow-stem auger borings, 17 of which were completed as monitoring wells to evaluate the extent of soil and groundwater contamination beneath and adjacent to the Property.

PAH-contaminated soil resulting from the former use of the Property as a wooden pipe treatment and storage facility generally appears to be limited to the Property and a portion of the Northwest 46th Street ROW. Soil in the vicinity of the former wood treatment operations contains elevated concentrations of cPAHs. Concentrations of benzo(a)pyrene that exceeded the MTCA Method A cleanup level generally were observed at depths between 2.5 and 11.5 feet bgs and were confined to the fill layer beneath the Property and a portion of the Northwest 46th Street ROW. The equivalent cPAH exceedances at each location were correlative with the detection of benzo(a)pyrene. Groundwater was not impacted by cPAHs.

Concentrations of arsenic detected in soil samples collected from within the ROWs and along the former BNSF railroad are likely a result of regional impacts and do not appear to be associated with activities conducted on the Property. Concentrations of arsenic exceeded the MTCA Method A cleanup level in soil on the eastern portion of the Property and along the northern Property boundary, although soil concentrations generally exceed the MTCA Method A Cleanup Level by less than 5 mg/kg. Two soil samples collected from the southern Property boundary also contained elevated arsenic concentrations.

Concentrations of arsenic in soil and groundwater collected from the North BINMIC area commonly exceed the MTCA Method A cleanup level. This is likely a result of the fill materials beneath the Property and vicinity and the ballast used in the construction of the railroads. Three of the ballast samples contained the highest arsenic concentrations relative to other soil samples collected from the Property and surrounding off-Property areas. In addition, arsenic is a common compound used in herbicides and is regularly used along roads and railways in an effort to reduce the growth of vegetation.

Based on the findings from the investigations conducted by SES and the historical research presented in this report, the Site has been defined to include the following criteria:

- Extent of PAH-contaminated soil both on and off of the Property associated with the historical use of the Property as a wood pipe treatment facility. The off-Property extent of PAH contamination identified in soil borings B47, B54, and B55 are included in the Site definition (Figure 11).
- Arsenic-contaminated soil beneath the Property.
- Arsenic-contaminated groundwater beneath the Property. Ecology has determined that the groundwater contamination associated with the historical use of the Property is limited to Area A, identified in Figure 11.

As discussed in Sections 5.1.1 and 5.1.2, the cleanup conducted on a site must comply with ARARs, which are discussed in greater detail above, as well as the cleanup standards proposed for the Site.

On-Property soil is compared to MTCA Method A cleanup levels for unrestricted land uses, which are sufficient to address the Property, as much of the subgrade soil will be removed prior to the construction of a belowground parking garage. Preliminary soil cleanup levels for arsenic will be based on unrestricted land use as defined in MTCA (20 mg/kg). Soil cleanup levels for PAHs will be compared to the cleanup level established for benzo(a)pyrene (0.1 mg/kg). Using the toxicity equivalence methodology in Chapter 173-340-708(8) WAC, equivalent concentrations of the remaining PAHs, including benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene, will be calculated and summed to obtain the total toxicity soil concentration for the total cPAH mixture as it compares to the cleanup level for benzo(a)pyrene.

MTCA Method A cleanup levels for groundwater are proposed for benzo(a)pyrene and arsenic in groundwater beneath the Property.

The table below presents the cleanup levels proposed for the Site remediation activities. Arsenic in soil and groundwater and benzo(a)pyrene (and associated TEFs) in soil are the COCs for the Site and will be addressed by the Site remediation.

Cleanup Levels Proposed for Site Remediation Activities

COC	Soil (mg/kg)	Groundwater (µg/L)
Arsenic	20[a]	5[b]
Benzo(a)pyrene	0.1[a]	0.1[b]

[a] MTCA Cleanup Regulation Chapter 173-340-900 WAC, Table 740-1, Method A Soil Cleanup Levels for Unrestricted Land Uses.
[b] MTCA Cleanup Regulation, Chapter 173-340-900 WAC, Table 720-1 Method A Cleanup Levels for Ground Water.
COC = chemical of concern
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
µg/L = micrograms per liter
WAC = Washington Administrative Code

Based on the information acquired during the RI, SES designated three remedial areas on the Site: those portions of the Property that are located within the proposed shoring system (Area A) those portions of the Property that are located outside the shoring system (Area B), and the portion of the Site located within the Northwest 46th Street ROW (Area C) (Figure 11). The shoring locations were chosen for cost and logistical reasons associated with the constructability of the planned development and in coordination with the disproportionate cost analyses conducted as part of the FS. Technologies reviewed for each of the areas (Areas A, B, and C) are discussed in greater detail in Section 5.6 above and summarized below.

Cleanup alternatives reviewed for Area A include:

- Cleanup Alternative 1a—Impermeable wall shoring (secant or sealed sheet pile) combined with the excavation of the source area and discharge to the storm system of the water captured in the proposed subgrade water intrusion control system.
- Cleanup Alternative 2a—Permeable wall shoring (soldier pile or unsealed sheet pile) combined with excavation of the source area and installing a permeable reactive barrier to pre-treat the water captured in the proposed subgrade water intrusion control system.
- Cleanup Alternative 3a—Permeable wall shoring combined with excavation of the source area and installing a permanent remediation system to treat the water captured in the proposed subgrade water intrusion control system.

Cleanup alternatives reviewed for Area B include:

- Cleanup Alternative 1b—Shored excavation of arsenic and PAH-contaminated soil with off-Site disposal.
- Cleanup Alternative 2b—Capping arsenic- and PAH-contaminated soil.

Cleanup alternatives reviewed for Area C include:

- Cleanup Alternative 1c—Shored excavation of PAH-contaminated soil with off-Site disposal.
- Cleanup Alternative 2c—Capping PAH-contaminated soil.

Based on the results of the FS, a combination of Cleanup Alternatives 1a, 2b, and 2c, which entail installing an impermeable shoring wall, excavating contaminated soil from within Area A, capping contaminated soil within Areas B and C, and monitoring the direct discharge of arsenic-contaminated groundwater within the buildings subgrade groundwater intrusion control system, will be applied during Site remediation.

Cleanup Alternatives 1a, 2b, and 2c meet the requirements set forth in Chapters 173-340-360(3) and 173-340-370 WAC. These cleanup alternatives received “favorable” scores for the evaluation criteria of protectiveness, permanence, cost, long-term effectiveness, implementability, and consideration of public concern. The rating of “average” was assigned for short-term risk management as a result of possible dust issues associated with the excavation. The rating of “favorable” was assigned for implementation because the secant wall creates a physical barrier that reduces the likelihood that the regional arsenic groundwater plume will migrate beyond the boundary of the shoring barrier on the Property, while the other two alternatives rely on treatment systems. Cleanup Alternatives 1a, 2b, and 2c received “very favorable” overall scores for the evaluation criteria of cost due to the significant cost savings relative to Alternatives 2a, 1b, and 1c (Tables 9a though 9g, Charts 1 through 3).

The selected cleanup alternative must comply with MTCA cleanup regulations specified in Chapter 173-340 WAC and with applicable state and federal laws. Under Chapters 173-340-350 and 173-340-710 WAC, applicable requirements 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.

Under the assumption that the information provided in this report meets the general requirements of the RI/FS as specified in Chapter 173-340-350 WAC, the following PCA was prepared for submittal to Ecology and includes a detailed scope of work for the proposed cleanup action and the monitoring requirements that will be implemented to document effectiveness and protect human health and the environment throughout the cleanup action. As discussed above, Alternatives 1a, 2b, and 2c, hereafter referred to as Alternative A, Alternative B, and Alternative C, respectively, were selected as the most effective, feasible, and appropriate remedial options.

In the event that additional contaminants are discovered during the course of the cleanup activities, their concentrations will be compared to the MTCA Method A cleanup levels for soil and groundwater.

6.1 AREA A – EXCAVATION WITHIN THE PERIMETER SHORING

Prior to beginning the excavation, large-diameter augers will be used to install a watertight secant shoring wall within the perimeter of the Property. As the excavation progresses, soil tiebacks will be installed approximately 8 feet below the street grade into Area B, Area C, and the surrounding ROW using a 6-inch auger. The first 10 to 15 feet of the soil cuttings pulled from the secant pile and the soil tieback augers will be separately stockpiled and characterized for arsenic and PAHs prior to disposal. The location and extent of the shoring system is included on Sheets SS1 through SS7 of the Project Plan Set by Clark Design Group, PLLC (Appendix H).

Once the shoring system is in place, excavation of arsenic- and PAH-contaminated soil will be conducted within the limits illustrated in Sheets C1-01 through C1-04 of the Project Plan Set (Appendix H) and to an approximate depth of 6 feet below the current on-Property grade. Analytical data collected during the RI and previous investigations, as well as compliance samples collected during the excavation process, will be used to guide the removal of arsenic- and PAH-contaminated soil. Where possible, visual indications of contamination will be used to direct the excavation. Excavated soil will be placed in temporary stockpiles pending characterization. Soil containing concentrations of PAHs or arsenic above their respective cleanup levels will be disposed of at a permitted facility. An environmental scientist from SES will be on the Property during the remedial excavation activities to screen and segregate soil for disposal.

In addition to the extent of arsenic- and PAH-contaminated soil identified during the RI, it is possible that soil with high pH may be identified beneath the former caustic mixing area within the former Wesmar building. A soil pH meter will be used to identify and segregate soil containing elevated pH. Soil exhibiting elevated pH will be stockpiled and profiled prior to disposal at a permitted facility.

Contaminated soil within the shoring boundary (Area A) will be removed until field screening and compliance samples indicate soil with COCs above their respective cleanup levels has been removed or the native soil interface is exposed. Immediately following the presumed removal of the contaminated soil within Area A, confirmation soil samples will be collected in accordance with the procedures described in Section 8.2.2. Locations characterized by concentrations of COCs above their respective cleanup levels will be overexcavated in 6-inch to 1-foot depth intervals and resampled. Once confirmation data show that COCs in soil have been effectively removed from Area A, the remaining soil will be excavated to the planned construction grade elevation per Sheets SS4 through SS7 of the Project Plan Set (Appendix H). Specific details regarding the sampling analysis and quality assurance programs are provided in the Sampling and Analysis Plan (SAP, Appendix I) and the Quality Assurance Project Plan (QAPP, Appendix J).

Locations within Area A that were identified as containing arsenic concentrations in soil exceeding the cleanup level will be excavated and consolidated into a stockpile for waste characterization and disposal at an appropriate off-Site facility.

Profile samples will be collected from the remaining construction excavation-generated soils to determine appropriate soil handling methods and disposal options.

6.2 AREA B – CAPPING ON-PROPERTY ARSENIC- AND PAH-CONTAMINATED SOIL BEYOND THE PERIMETER SHORING

The portion of the Property located beyond the shoring system for the proposed building will be capped with a combination of asphalt, landscaping, and concrete sidewalks. Formal deed restrictions will be recorded for the portions of the Property that exhibit concentrations of COCs in excess of their respective cleanup levels.

6.3 AREA C – CAPPING PAH-CONTAMINATED SOIL LOCATED WITHIN THE RIGHT-OF-WAY

As described in Section 4.0, soil in one area beyond the Property boundary (Area C) has been confirmed to contain concentrations of PAHs in excess of the MTCA Method A cleanup level. The PAH contamination in Area C is limited to approximately 18 cubic yards in volume, and it is capped by the ROW improvements and approximately 11 feet of clean soil.

Due to the depth of the contaminated soil, any utility work or ROW improvement projects (street paving or sidewalk improvements) that may be conducted are not likely to extend to the contaminated zone. If a need arises to access the PAH-contaminated soil in the ROW for the installation or maintenance of deep utilities, the preliminary risk assessment included in Section 4.7.2 suggests that the PAH concentrations in the ROW soil associated with the Site do not represent a direct exposure hazard to construction/utility workers who may come in contact with it.

An environmental covenant will be placed on the Property and will include the PAH-contaminated soil located within Area C (Figure 21A). The covenant will include instructions for regulatory notification, waste handling, and disposal profiling if contaminated soil within Area C is accessed. In reference to the soil contamination within Area C, the covenant will extend from 6 feet bgs to below the maximum depth of soil contamination encountered. The City of Seattle (City) has been notified in writing of the Area C contamination and that an environmental covenant will be placed on the Property and will reference Area C. Ecology has determined that the environmental covenant will be sufficiently protective of human health and the environment without subrogation of the City's ROW interest. If the City conducts any maintenance or repair of street and sidewalk surfaces or utilities in Area C, the City is responsible for following appropriate health, safety, and soil management protocols described in the environmental covenant.

6.4 POINT OF COMPLIANCE

While the Area A excavation will likely meet cleanup levels, because some contaminated soil will be left in place and contained by capping in Areas B and C. Therefore, the conditional point of compliance for soil at the Site is "containment" per Chapter 173-340-740(6)(f) WAC. A standard point of compliance will be used for the arsenic-contaminated groundwater associated with the Site, per Chapter 173-340-720(8)(b) WAC. The Site is excluded from a terrestrial ecological evaluation because the contaminated soil beneath Areas B and C is currently, and will continue to be, covered by buildings, paved roads, and other physical barriers (Chapter 173-340-7491[b] WAC). Therefore, no point of compliance under the ecological risk assessment needs to be defined for the Site. A Terrestrial Ecological Evaluation form is attached to this report as Appendix G.

6.5 INSTITUTIONAL CONTROLS

Following approval from Ecology, a specific deed restriction, which will include the survey limits for Areas B and C, that contain soil exhibiting elevated concentrations of arsenic and PAHs, will be recorded with the King County Tax Assessor and attached to the title of the Property. The remainder of the Property will be covered by a mixed-use commercial/retail building and the surrounding ROWs capped with concrete sidewalks. The extent of the deed-restricted area (Area B) is depicted in Figure 21A.

7.0 WORK ACTIVITY SUMMARY AND SEQUENCE FOR REMEDIATION

This section briefly describes Site preparation for the excavation and removal of the PAH- and arsenic-contaminated soil from within Area A.

7.1 CONSTRUCTION SETUP

The excavation contractor will mobilize to the Property and set up operational areas necessary to implement the remedial and construction plans. Subsequent work will proceed generally as described in the following sections.

7.1.1 Property Security and Public Notice

The work will involve securing the Property from trespass and from entry by the unprotected public. The preparations will include installing temporary fencing around the perimeter of the Property, posting suitable warning signs every 50 feet along the temporary fence, posting a notice at Property entrances to convey information of the exposure hazards that are represented by the contamination on the Property, and submitting a written notice to the City of Seattle and regulatory agencies as prescribed in the private rights of action section of MTCA (Chapter 173-340-545 WAC).

7.1.2 Shoring Installation

The secant-pile wall is to be constructed of 24-inch-diameter piles in the first pass, followed by 24-inch-diameter piles in the second pass. The second pass piles are to overlap the first pass by 5 inches on either side. This will create a wall with a minimum thickness of 14.6 inches throughout. The pile depth will extend to -10 foot Elevation, or 15 feet below the planned excavation depth for development. As the excavation progresses, soil tiebacks will be installed approximately 8 feet below the street grade to anchor the secant piles using a 6-inch auger. The shoring installation will be coordinated by the General Contractor and installed according to Sheets SS1 through SS7 of the Project Plan Set (Appendix H).

The secant-pile wall is to be constructed of fly ash concrete in a relatively lean mix. This is designed to have low permeability (i.e., limited hydraulic conductivity) and low strength. This enables the material to work well at withholding water and allows the overdrilling of the initial piles with the secondary steel reinforced piles in order to provide the required strength to withhold the soil and water pressures. The permeability of the constructed secant-pile wall is conservatively estimated at 6.4 X 10^{-7} centimeters/second, approximately that of tight clay. This permeability allows for imperfections at the seams between the individual secant piles (SES 2008b). The estimated aggregate permeability for the secant-pile wall with leaky seams is representative; one of the principal design features of the secant-pile wall is to withhold water from the excavation and subsequently the building's subgrade water intrusion control system.

7.1.3 Stabilized Construction Entrance and Wheel Wash

A 12-inch-thick, rock-stabilized construction access/decontamination pad and wheel wash will be constructed on the southern portion of the Property (Sheets C1-01 and C1-03 of the Project Plan Set [Appendix H]). The pad will limit off-Property migration of arsenic- and PAH-contaminated soil from the Property by reducing contact between vehicles and Property soils and by providing an area to remove mud from truck tires. The pad will be constructed by excavating a shallow pit that will be lined with a heavy-duty plastic liner and sloped toward the excavation interior in order to collect any rain or wash water. The liner will be covered with sand, pea gravel, and/or quarry spalls meeting Washington State Department of Transportation Specification 9-13.6 (WSDOT 2006). Upon conclusion of the excavation activities, the access/decontamination pad will be excavated, transported, and disposed.

7.1.4 Construction Dewatering

Water that collects within the excavation will be pumped into a holding tank and stored on the Property. Dewatering details can be found on the Temporary Erosion and Sediment Control Sheet (Sheets C1-01 through C1-04 of the Project Plan Set [Appendix H]).

Groundwater flow into the excavated interior of Area A during construction will be limited. It is estimated that accumulation of groundwater will occur principally as seepage through the floor of the excavation through the native glacial till. Groundwater flow through the floor of the excavation is estimated to have a maximum rate of 12.3 gallons per minute (gpm) with an average flow rate of 2.2 gpm across the entire excavated area (SES 2008b). Groundwater flow through the secant-pile sidewalls of the excavation is anticipated to occur as slow seepage through the wall. The anticipated flow rates range from 0 to 1.4 gpm depending on the interpile leakage rate. Interpile leakage in excess of 1.5 gpm will be reduced during construction using concrete surface sealing techniques.

The extracted water for construction will be permitted and discharged to the King County Metro sewer system via the local sewer system or treated on-Site to Washington State Surface Water Quality Standards and discharged to the stormwater system. The quantity and quality of water to be generated are expected to be acceptable for discharge to the Metro sewer system. The public storm drain (PSD) in 14th Avenue Northwest discharges to Lake Union. All discharges to the PSD shall meet state water quality requirements for all regulated parameters, including, but not limited to, turbidity (reported as NTU), pH, and all contaminants (such as those listed above). Maximum levels and thresholds for these parameters are generally regulated by Ecology's Surface Water Quality Standards for Marine Waters (e.g. turbidity, pH, and some metals, such as arsenic) under Chapter 173-201A WAC. For contaminants that do not have Surface Water Quality Standards, the maximum levels in Property discharges shall not exceed Ecology's MTCA Method A Ground Water Cleanup Levels under Chapter 173-340 WAC.

It will be the Contractor's responsibility to understand the soil and groundwater COCs on the Property as well as the treatment methods and cleanup requirements for these COCs. It is also the Contractor's responsibility to sample, perform testing, and monitor all Property discharges to the PSD, as needed, to assure that state water quality requirements are being met for all construction discharges.

7.1.5 Health and Safety Protocol

A health and safety plan detailing cautionary procedures that will be followed by all personnel on the Site during construction excavation activities will be prepared prior to beginning field work. Daily health and safety meetings will be conducted as part of the protocol.

7.2 ENGINEERING DESIGN DOCUMENT FOR PCA IMPLEMENTATION

The following subsections present an engineering design document that specifies the activities required to implement the proposed PCA.

7.2.1 Excavation of Arsenic- and PAH-Contaminated Soil

The following remedial work activities will be implemented by the excavation and general contractors in accordance with detailed plans and specifications included within this report (Appendix H):

- Install the perimeter shoring system using large-diameter augers.
- Remove arsenic- and PAH-contaminated soil to a depth of 10 to 15 feet bgs from Area A and stockpile excavated soil on-Property pending characterization and disposal.
- Load and transport excavated soil to appropriate disposal facilities and fill sites.
- Collect confirmation samples from excavated portions of Area A.
- Cap Area B with concrete sidewalks, asphalt driveways, and landscaping surrounding the planned building.
- Cap Area C with asphalt.

7.2.1.1 Excavation Preparation

The excavation phase of the remediation will commence following the completion of the demolition phase. The sequence of excavation is designed to minimize vehicular traffic on impacted soil, thereby reducing the potential for cross-contamination of non-impacted areas of the Property. Prior to commencing excavation, utility locations that were identified during the demolition phase will be confirmed and remarked, if necessary, and the perimeter shoring system will be installed.

7.2.1.2 Excavation Sequence, Estimated Volume, and Methods

Approximately 27,300 tons of arsenic- and PAH-contaminated soil will be excavated following the installation of the shoring system. Excavation will commence in the eastern portion of Area A and progress westerly toward the stabilized construction entrance and decontamination pad. A track-mounted excavator will excavate soil and place it in a temporary stockpile. A rubber-tired front-end loader will pick up stockpiled contaminated soil and place it in dump trucks staged at the stabilized construction entrance.

Guidance for the final vertical and lateral extent of the arsenic and PAH excavations shall be based upon data obtained during the RI and previous investigations conducted on the Site, field observations and screening, and the results of confirmation sampling and testing. If performance samples indicate that contamination remains after the initial excavation is completed, additional soil will be excavated and additional samples will be collected. This process will continue until confirmation sampling demonstrates that the cleanup levels have been achieved.

Profile samples will be collected from the remaining construction excavation-generated soil to evaluate appropriate soil handling methods and disposal options.

During excavation, the excavator operator will be escorted by at least one person functioning as a Spotter. The Spotter's responsibilities include:

- Enforcing a no-personnel zone within the swing radius of the excavator;
- Observing excavations for subsurface structures, such as unidentified utilities, artifacts, and sidewall stability;
- Abiding by all regulations pertaining to discovery and excavation of archaeological resources, including, but not limited to, Chapters 27.34, 27.53, 27.44, 79.01, and 79.90 RCW and Chapter 24-48 WAC, as applicable;
- Field screening of excavated soil with various techniques (e.g. photoionization detector, sheen test, visual observation) to assess impacts; and
- Notifying the Site Manager when a designated area of excavation has been completed and is ready for sampling.

A safety meeting will be conducted prior to the start of each workday to inform existing and new site personnel of changing work conditions and to reinforce key safety requirements. During the safety meeting, specific instructions will be given to each equipment operator that spillage of excavated soil is to be minimized. In particular, operators will be instructed to carry only 3/4-full buckets and travel at moderate speeds to prevent soil spilling during transport to the stabilized construction entrance or during placement in the dump trucks.

A Soil Loading Technician shall be present at all times during the loading of soil into dump trucks to help identify when each truck is fully loaded. Truck drivers will be specifically instructed that they are to remain in their trucks at all times with the windows closed. The Soil Loading Technician shall also be responsible for inspecting the truck after loading to confirm that spillage of soil has not occurred onto the outside structures of the trucks (e.g. running boards, tongue, etc.) and that the load is properly covered, if required. If spillage has occurred, the Soil Loading Technician shall collect the spillage and place it back into the truck. If spillage becomes a recurring problem, a wheel/vehicle wash area will be designated as a contingency to help prevent contaminated soil from being inadvertently tracked off-Site.

7.2.1.3 Transportation and Disposal

Truck drivers shall be instructed to keep hazardous waste manifests and bills of lading with them at all times while transporting impacted soil. Drivers will also be instructed that direct routes to the waste facilities are to be used and no overnight layovers are permitted while the trucks are loaded. Drivers will be provided the Site Manager’s phone number as well as the 24-hour emergency contact number.

The Site Manager will maintain a log of soils disposed off-Property, including the number of trucks with the date and time of departure from the Site, estimated weight and volume, destination, waste manifest numbers, and other appropriate documentation.

All soil waste manifests, weight tickets, and bill of lading shall be signed by the respective disposal facilities and returned to SES. These documents will be included as attachments to the Cleanup Action Report, which will be completed at the end of the project.

7.2.1.4 Previously Unidentified Contaminants

Monitoring of Site remediation activities will be limited to testing for arsenic and cPAHs. Therefore, the detection of unknown contaminants will rely solely on exhibition of field-screenable characteristics, such as odor and color. SES personnel will collect representative samples and submit them for laboratory analysis and identification prior to disposal at a permitted facility.

7.2.2 Capping Area B and Area C

The perimeter of the Property (Area B) and a portion of Northwest 46th Street (Area C) will be capped per the design specifications on Sheets L3.01 through L3.03 of the Project Plan Set (Appendix H).

7.2.3 Institutional Controls

An institutional control will be applied to the portions of the Property located outside of the shoring walls (Areas B and C), which are depicted on Figures 21a through 21h. See Section 6.5 for additional details.

7.2.4 Site Restoration

It is anticipated that Property development work will occur in conjunction with the cleanup action.

8.0 COMPLIANCE MONITORING

There are three types of compliance monitoring identified for remedial cleanup actions performed under MTCA (Chapter 173-340-410 WAC): Protection, Performance, and Confirmation Monitoring.

A paraphrased definition for each is presented below (Chapter 173-340-410 [1] WAC). Additional details regarding procedures for sample collection, handling, and quality assurance procedures are included in the SAP and QAPP attached to this report as Appendices I and J, respectively.

- **Protection Monitoring**—To determine if human health and the environment are adequately protected during construction and the operation and maintenance period of an interim action or cleanup action as described in the health and safety plan.
- **Performance Monitoring**—To document that the interim action or cleanup action has attained cleanup standards.
- **Confirmation Monitoring**—To evaluate the long-term effectiveness of the interim action or cleanup action once cleanup standards or other performance standards have been attained.

8.1 PROTECTION MONITORING

A separate health and safety plan will be prepared for the remedial action that meets the minimum requirements for such a plan identified in federal (Title 29 CFR, Parts 1910.120, and 1926) and state regulations (WAC Title 296). A complete job hazard analysis will be prepared for the health and safety plan that identifies all known physical, chemical, and biological hazards, hazard monitoring protocols, and administrative and engineering controls required to mitigate the identified hazards.

8.2 PERFORMANCE MONITORING

The objectives for performance monitoring are to document compliance with waste analysis profiles and that cleanup levels are achieved. To demonstrate compliance, the following separate performance monitoring activities are planned for the remedial action:

- Waste profiling for off-Site treatment or disposal.
- Confirming that cleanup levels have been achieved.

The performance monitoring activities are described in the following subsections.

8.2.1 Waste Profiling for Off-Site Treatment or Disposal

Wastes generated during the remedial activities will require analytical testing before they are transported off-Site for disposal. Generally, the treatment, storage, or disposal facility (TSDF) receiving the waste specifies the minimum number of samples and analytical tests before accepting wastes from the project. Wastes that will be generated from the remedial action destined for off-Site disposal include:

- Contaminated soil removed by installing the secant wall and through excavation,
- Contaminated groundwater from excavation dewatering,
- Contaminated personnel protective equipment,
- Decontamination solutions, and
- 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 subjected to performance monitoring. Ecology guidance for remediation of petroleum-contaminated soils (Ecology 1995) suggests that samples of stockpiled excavated soil be collected from locations where field survey methods indicate that contamination is likely to be present and that samples be collected from a depth of 6 to 12 inches beneath the surface of the pile. The minimum number of samples for excavated soil is listed in Table 3 of Ecology's 1995 guidance document. The number of samples collected for performance monitoring of soil destined for off-Property disposal will be the number shown in Table 3 (Ecology 1995) or the number required by the TSDF for waste profiling, whichever is greater. The required analytical tests for these samples will be established by the TSDF.

8.2.2 Confirming That Cleanup Levels Have Been Achieved

The excavation will be conducted based on the findings of the RI and previous investigations. Soil will be excavated to a total depth of 10 to 15 feet bgs (Figures 12, 13, and 21a through 21h). A 50-foot systematic sampling grid will be superimposed over the exposed excavation area being tested (sidewalls and floor). A grid size of 50 feet will result in a statistically valid number of at least 43 soil samples based on the size of Area A (Figure 22). Confirmation soil samples will be collected from each grid node following excavation and submitted for analysis of arsenic and PAHs.

To confirm that cleanup levels have been achieved, the mean concentrations of specific cPAHs and arsenic will be compared to their respective cleanup levels in accordance with the statistical guidance provided by Ecology (Ecology 1992). As detailed in the guidance, confirming whether the Site is clean is based on a comparison of the 95th percent upper confidence limit on the mean (UCL_{95}) with the defined cleanup level. Each sample will be analyzed for the constituents of concern at a detection limit low enough to detect compliance with the cleanup level. The resulting data will then be tested for conformance with distributional assumptions (normal versus lognormal) and the UCL_{95} calculated based on the methods described in the Ecology 1992 guidance document.

If the UCL_{95} for a specific constituent does not exceed the cleanup level, then the Site is considered clean; otherwise, it is still considered contaminated. The Site is considered clean when the UCL_{95} for each COC is less than its respective cleanup level. This statistical approach allows for post-sampling excavation to remove individual sample hot spots that cause exceedance of the cleanup levels and retesting to assess if the recalculated UCL_{95} exceeds the cleanup level. In the event that utilities or other improvements are installed outside of the perimeter shoring system, soil samples will be collected from the floor and sidewalls of the excavations and submitted for analyses of arsenic and PAHs. Soil exhibiting elevated concentrations of COCs will be overexcavated and resampled.

8.3 CONFIRMATION MONITORING

It is anticipated that on-Property groundwater quality will be substantially restored by virtue of installing the shoring barrier wall, dewatering the excavation, and removing the contaminated soil from Area A. Water accumulated during the construction process and captured in the permanent building's subgrade water intrusion control system will require discharge per Section 7.1.4.

8.4 GROUNDWATER MONITORING REQUIREMENTS

8.4.1 Permanent Dewatering System Monitoring

The proposed alternative consists of installing a watertight shoring wall that extends approximately 30 to 40 feet below the street surface grade and approximately 20 feet below the soil/groundwater interface. These controls make it unlikely that the regional arsenic groundwater plume would infiltrate into the permanent subgrade water intrusion control system that is proposed to be installed beneath the building (Sheet C1-04, Appendix H).

Water collected in the subgrade water intrusion control system will be discharged to the storm system. The discharge from the building subgrade water intrusion control system will be monitored to confirm that arsenic- and PAH-contaminated groundwater is not migrating into the building area and that discharge water complies with surface water discharge standards, as described above.

Upon initial operation of the permanent building water intrusion control system, discharge sampling will be conducted weekly for 3 weeks to monitor arsenic concentrations. Concentrations of arsenic detected in the discharge water over the 3-week sampling program will determine the following action items:

1. If arsenic concentrations in the discharge water in all three weekly sampling events contain concentrations between 0 and 5 µg/L, then weekly sampling will be discontinued and quarterly monitoring will be implemented as described in Section 8.4.2.
2. If arsenic concentrations in the discharge water in any one of the three weekly sampling events contain concentrations greater than 5 µg/L, then weekly sampling will be extended for an additional 3 weeks.
3. If arsenic concentrations in the discharge water in the six weekly sampling events contain an average concentration of less than 5 µg/L, then weekly sampling will be discontinued and quarterly monitoring will be implemented as described in Section 8.4.2.
4. If arsenic concentrations in the discharge water in the six weekly sampling events contain an average concentration greater 5 µg/L, then a treatment system, as described Section 5.6.1.1, will be added to the permanent dewatering system. The weekly sampling program will be repeated upon installation of the treatment system.

8.4.2 Long-Term Groundwater Monitoring

Per Chapter 173-340-410 WAC, compliance monitoring is required for any site that utilizes containment as a part of the cleanup action plan. Consequently, a groundwater monitoring program will be implemented to evaluate whether the cleanup action proposed herein is sufficient for the protection of human health and the environment. Water discharged from the subgrade water intrusion control system will be sampled for total arsenic in a quarterly basis during the first year, semiannually during the second and third years, and annually during the fourth and fifth years. If arsenic is not detected above the applicable cleanup level in the groundwater after 5 years, then monitoring may be discontinued. If arsenic concentrations above 5 µg/L are detected in any of the scheduled monitoring events beyond the initial 3- to 6- week monitoring program, the weekly program described above will be reinstated to evaluate the need for treatment.

Sampling for arsenic in the subgrade water control system will be initiated upon startup of the permanent dewatering system after construction of the building foundation. The results of the monitoring events will be submitted to Ecology.

9.0 SCHEDULE FOR IMPLEMENTATION AND REPORTING

The remedial action is a planned component of a commercial redevelopment project at the Site subject to two Master Use Permits (MUPs) issued by the City of Seattle on September 29, 2008. MUP 3008041 was issued for the west building (Legal Description: LTS 1-6 & 17-22, BLK 173, GILMAN PARK ADDITION LESS PORTION FOR STREET) with a shoreline substantial development permit component. MUP 3008041 will remain active until September 5, 2013, presuming construction commences by September 5, 2010. MUP 3008040 was issued for the east building (LTS 7-16, BLK 173, GILMAN PARK ADDITION LESS PORTION FOR STREET. SUBJ TO ESMT OVER SELY POR OF LOT 12 FOR A SPUR STRACT REC #3761195) and will remain active until August 26, 2011, but could be extended for additional periods upon issuance of a building permit. The remedial action component of the development is anticipated to commence on or before September 5, 2010, if market conditions allow. However, if market conditions preclude commencement of work by September 2010, and the commercial redevelopment project cannot proceed as currently planned, pursuant to the terms of the Consent Decree, Ecology and the PLPs and/or successors would negotiate an amended, MTCA-compliant cleanup action and schedule consistent with Chapter 173-340-360 WAC. The existing FS and PCA would be revised in accordance with Chapters 173-340-350 and 173-340-380 WAC, respectively, and resubmitted to Ecology. In addition, an updated Public Participation Plan would be implemented to provide for public comment pursuant to Chapter 173-340-600 WAC.

The table below presents the schedule for finalization of the Consent Decree and implementation of the recommended cleanup alternative selected above in Section 5.7.

Activity	Time Frame
Consent Decree, Public Participation Plan and SEPA Notice	September 2009
Public Notice, including Public Hearing, if necessary	October-November 2009
Ecology Responsiveness Summary; Finalize RI/FS/PCA	December 2009 – January 2010
Finalize Consent Decree, Lodging of Consent Decree in Superior Court.	January-February 2010
Remediation Construction	September 2010* (or earlier)
Cleanup Action Report	3 months after completing the cleanup action
Groundwater Monitoring	Within 3 months of completing the cleanup action

*The commencement of work is dependent on market conditions.
PCA = Cleanup Action Plan
FS = Feasibility Study
RI = Remediation Investigation
SEPA = State Environmental Policy Act

10.0 LIMITATIONS

The findings and conclusions documented in this report were prepared for the specific application to this project and were developed in a manner consistent with that level of care and skill normally exercised by members of the environmental science profession currently practicing under similar conditions in the area. A potential always remains for the presence of unknown, unidentified, or unforeseen subsurface contamination on portions of the Property not sampled, such as under buildings. No warranty, expressed or implied, is made. This report is for the exclusive use of Bridge Group II, LLC, Block at Ballard II, LLC, and their representatives.

11.0 BIBLIOGRAPHY

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FIGURES

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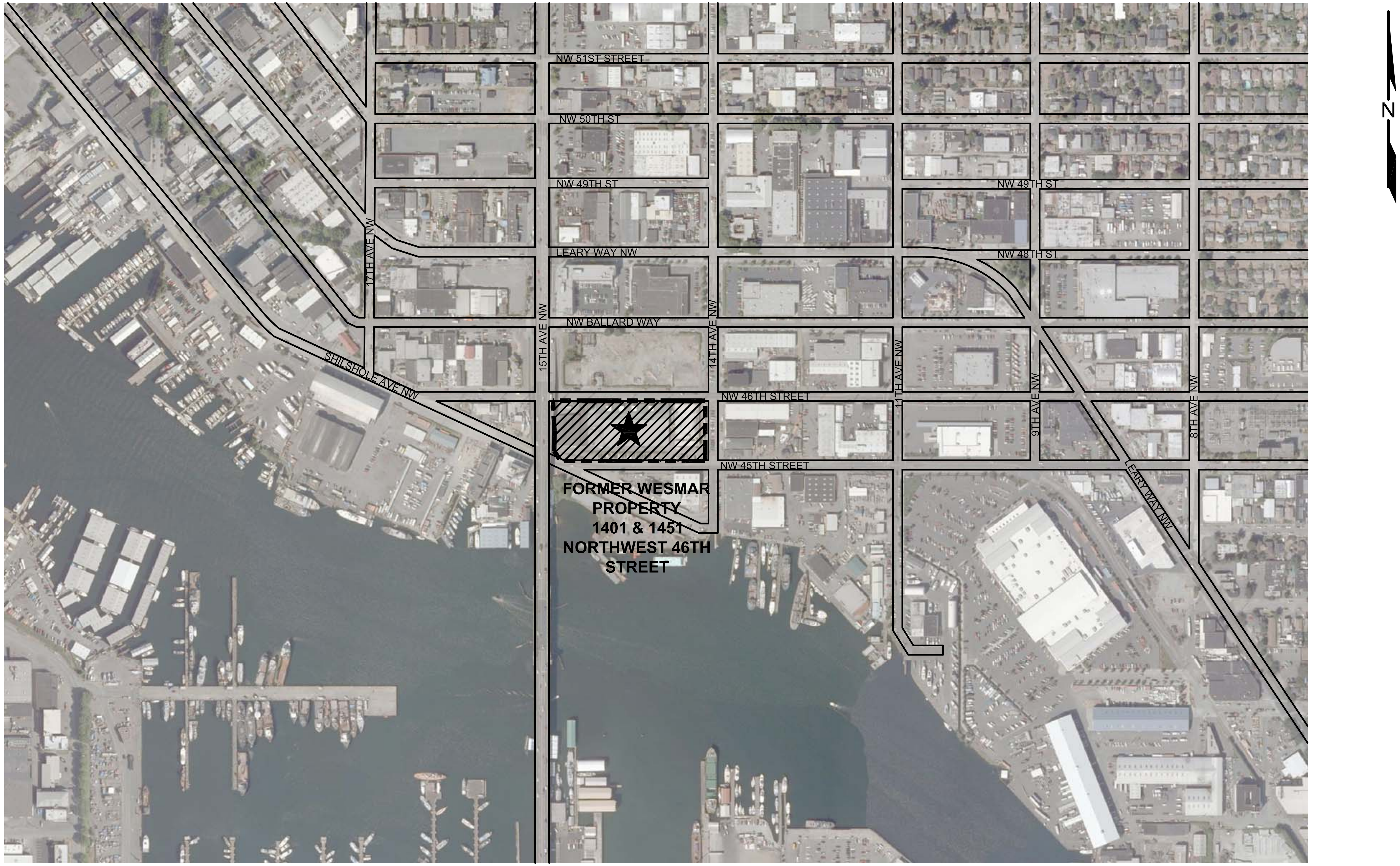

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: NAC
CHECKED BY: EKR
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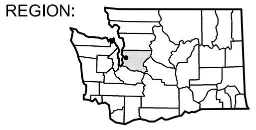
PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:



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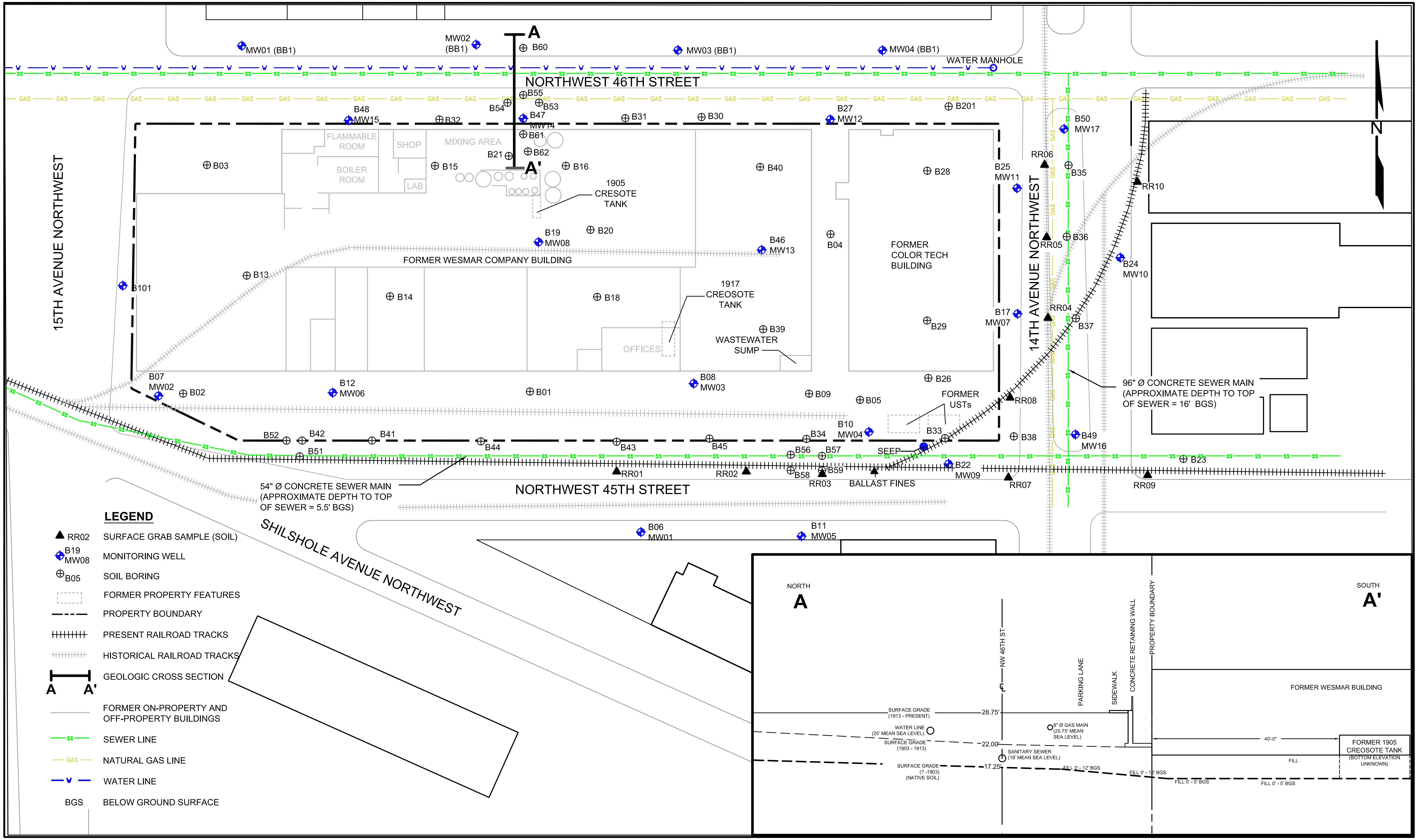
APPROXIMATE SCALE IN FEET 1" = 360'

FIGURE 1
VICINITY MAP

SOUNDENVIRONMENTAL.COM



SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB/JQC
CHECKED BY: EKR
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PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398_002
STREET ADDRESS: 1401 & 1451 NW 46TH ST
CITY, STATE: SEATTLE, WASHINGTON

REGION:

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

FIGURE 2
GRADING TIMELINE
GEOLOGIC CROSS SECTION A-A'

1/15/2010
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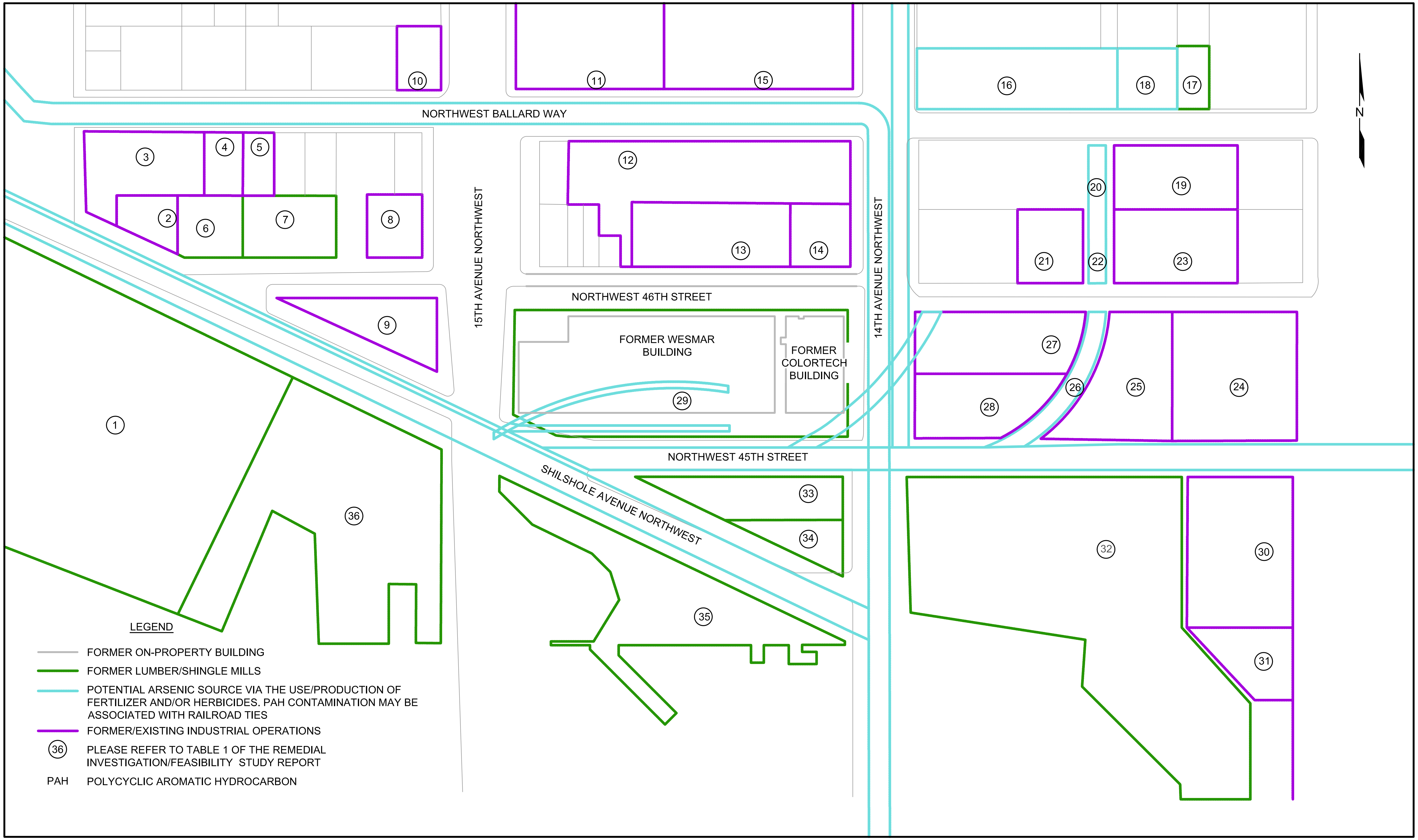

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
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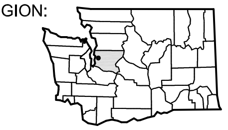
PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002
STREET ADDRESS:......................1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:.................................SEATTLE, WASHINGTON

REGION:



0 75 150 300
APPROXIMATE SCALE IN FEET 1" = 150'

FIGURE 3
POTENTIAL SOURCES OF ENVIRONMENTAL IMPACT

P:\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Technical\CAD\2008 RIFS_CAP Report_jqc\0398-002_FIG3 EI_F.dwg

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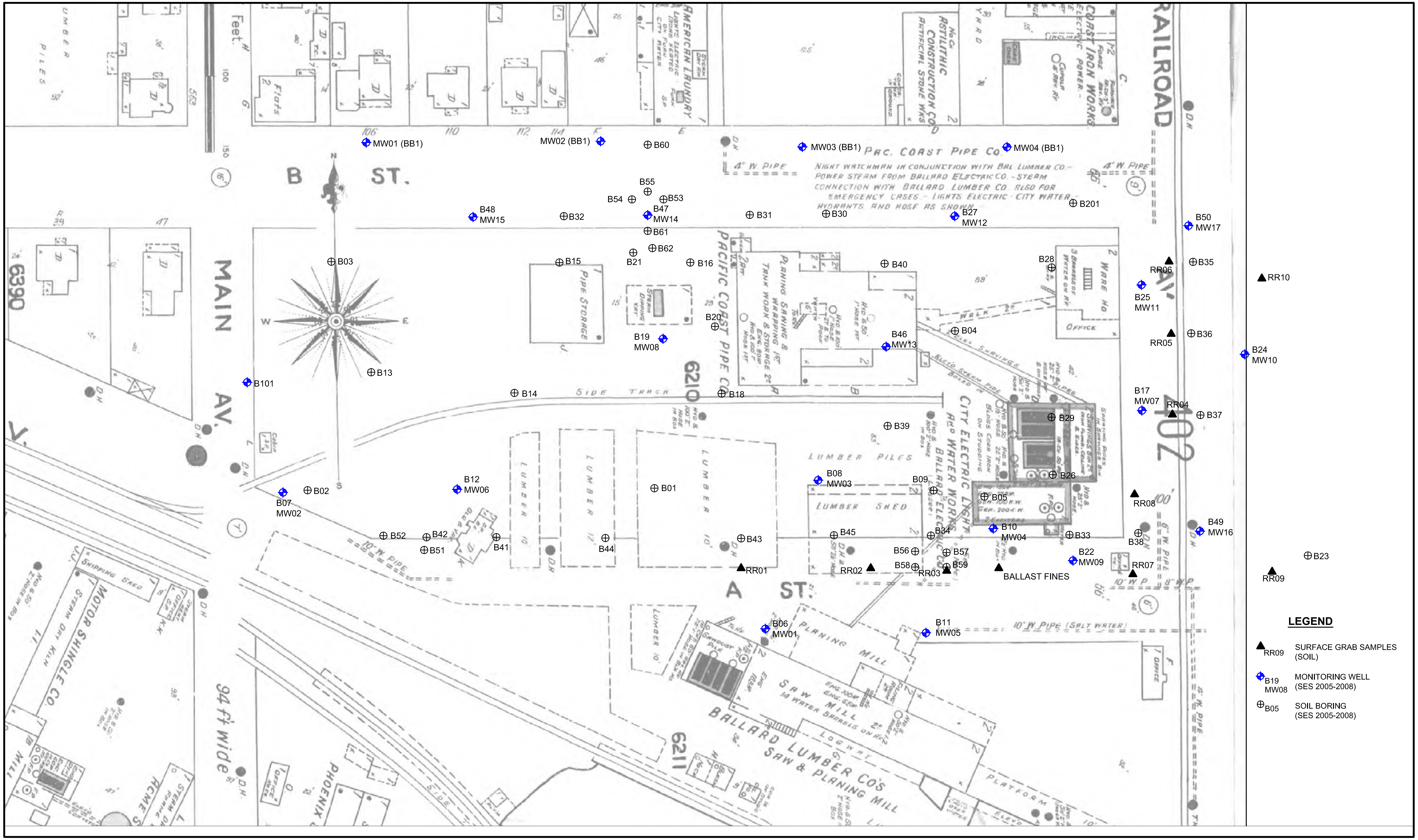

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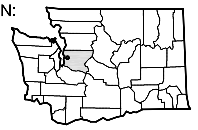
DATE: 01/15/10
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG4 SANBORN05

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

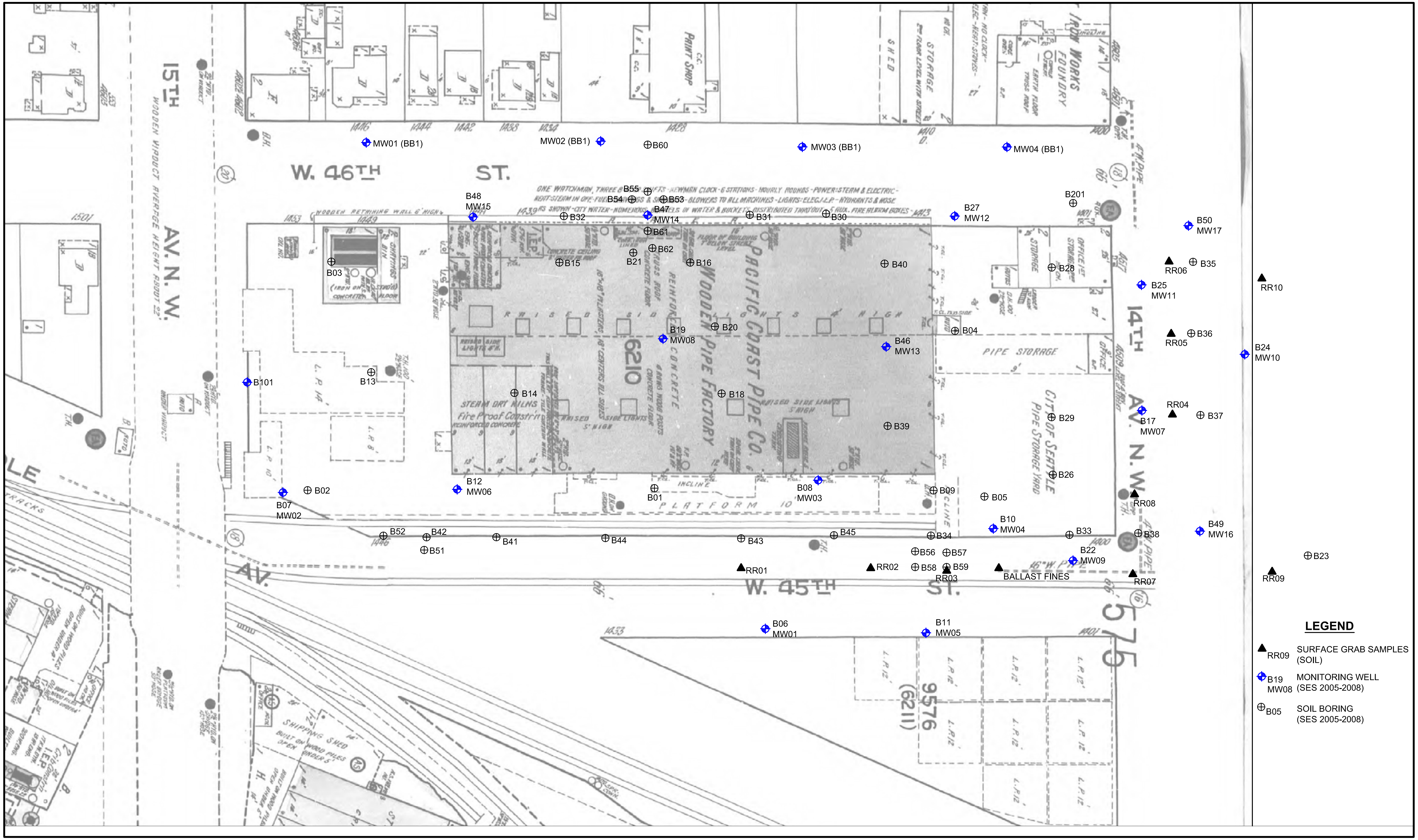
REGION:



0 15 30 60 120
APPROXIMATE SCALE IN FEET 1" = 60'

FIGURE 4
1905 SANBORN MAP

\\Sounddc\SES CURRENT PROJECTS\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 SANBORN17.dwg 1/15/2010



LEGEND

▲ RR09	SURFACE GRAB SAMPLES (SOIL)
⊕ B19 MW08	MONITORING WELL (SES 2005-2008)
⊕ B05	SOIL BORING (SES 2005-2008)

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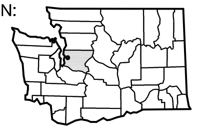
DATE: 01/15/10
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG5 SANBORN17

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:

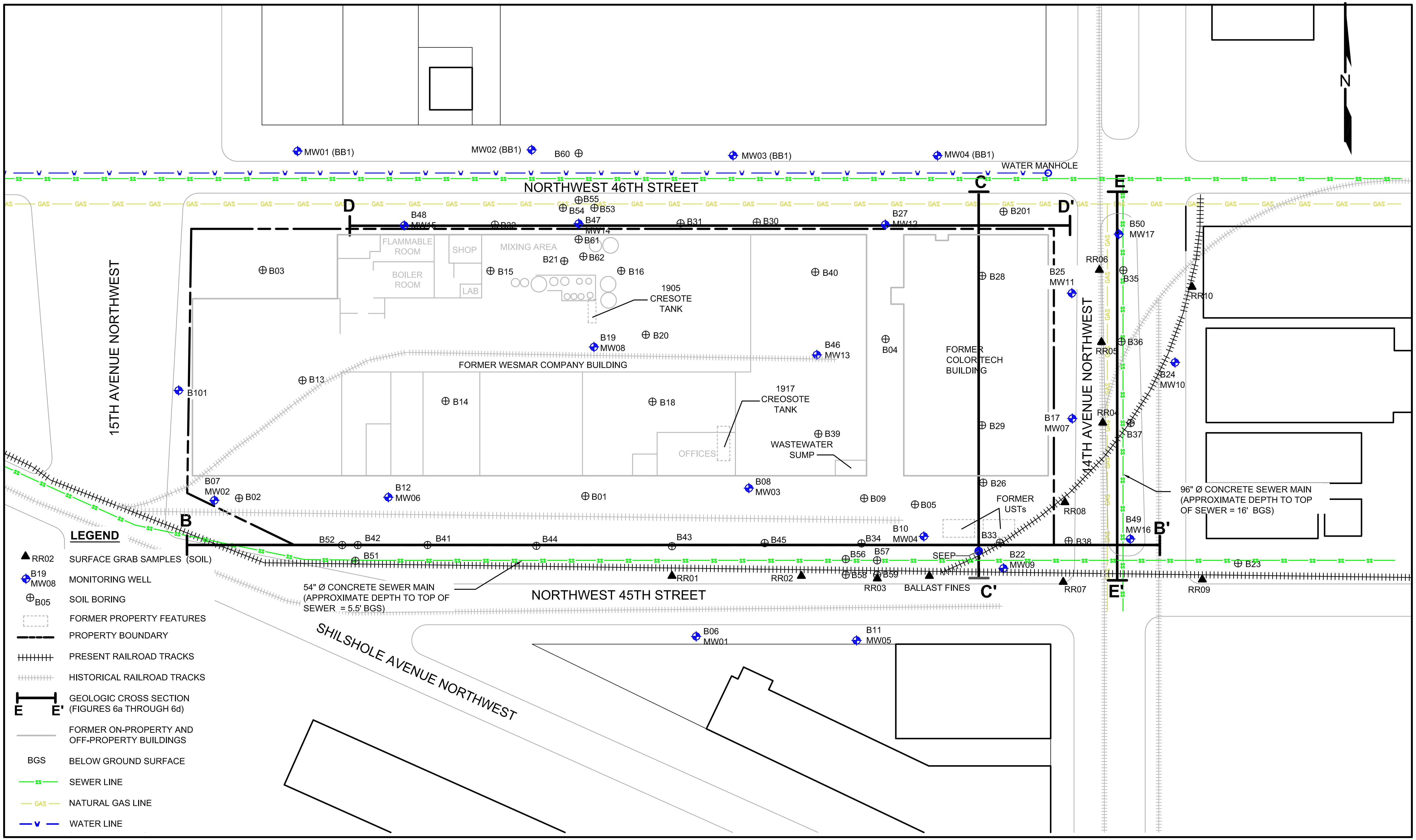


0 15 30 60 120
APPROXIMATE SCALE IN FEET 1" = 60'

FIGURE 5
1917 SANBORN MAP

1/15/2010

\\Sounddc\SES CURRENT PROJECTS\0398 Ballard Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 EL.dwg



SOUND ENVIRONMENTAL STRATEGIES
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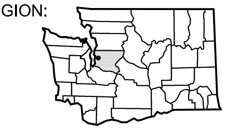
DATE: 01/15/10
DRAWN BY:................NAC/JQC
CHECKED BY: ....EKR
CAD FILE: ....0398-002_FIG6 EL

PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002
STREET ADDRESS:.....................1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:.................................SEATTLE, WASHINGTON

REGION:



0 15 30 60 120

APPROXIMATE SCALE IN FEET 1" = 60'

FIGURE 6

EXPLORATION LOCATION PLAN WITH GEOLOGIC CROSS SECTIONS

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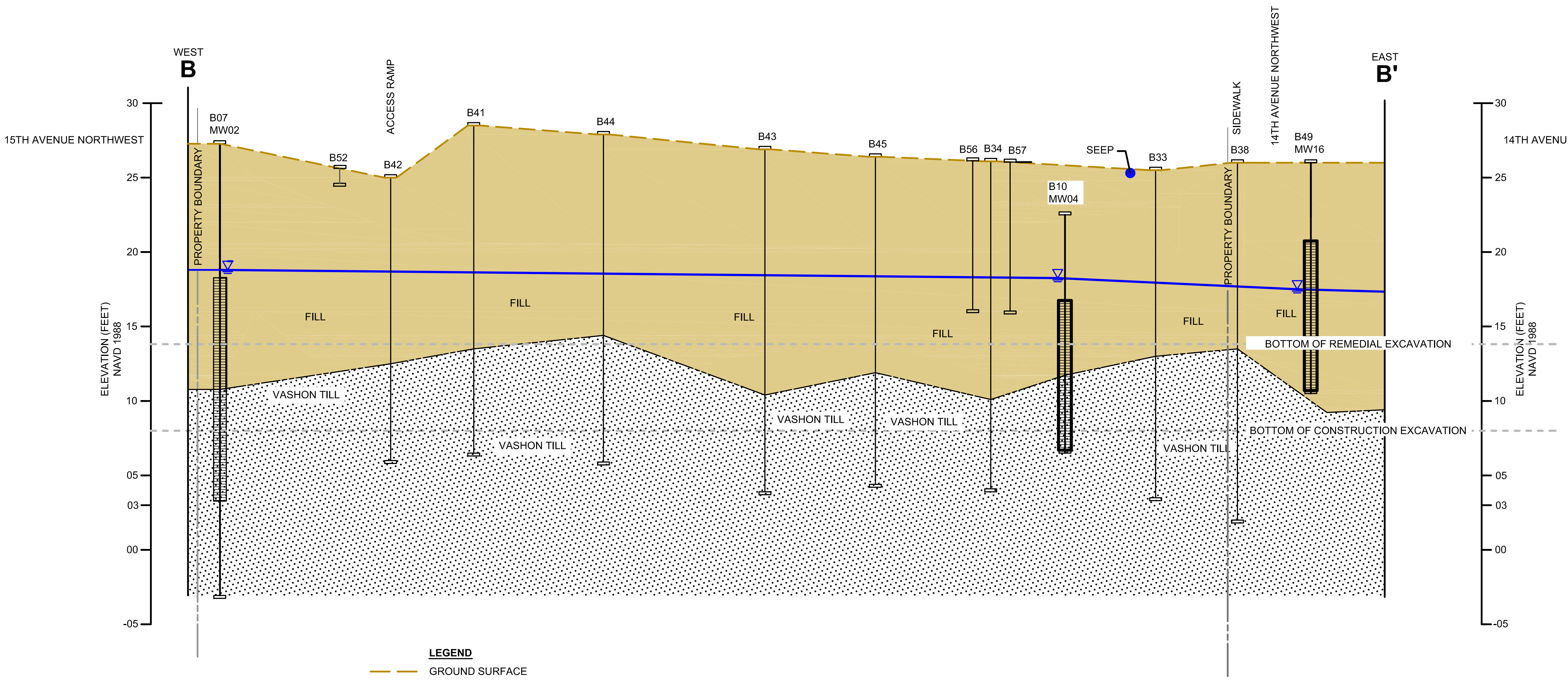
9/11/2008

\\Sounddc\SES CURRENT PROJECTS\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 XAA.dwg



LEGEND

GROUND SURFACE

SCREENED INTERVAL

APPROXIMATE WATER TABLE ELEVATION (DECEMBER 2007)

APPROXIMATE FILL/NATIVE TILL INTERFACE

NOTE:
1) VERTICAL SCALE EXAGGERATED 8X
2) B-07/MW-02 AND B-10/MW-04 ARE OFFSET FROM THE TRANSECT. DATA PRESENTED ON THIS CROSS-SECTION ARE APPROXIMATE
3) FILL: PREDOMINANTLY SAND AND SILT WITH VARIABLE AMOUNTS OF GRAVEL AND CLAY; MISCELLANEOUS ORGANIC DEBRIS (e.g., WOOD AND BRICK) IN PLACES
4) VASHON TILL: GENERALLY SILT AND SILTY SAND WITH TRACE GRAVEL AND CLAY

SOUND ENVIRONMENTAL STRATEGIES
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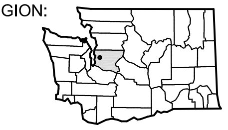
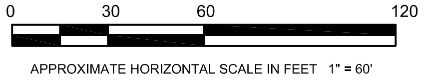
DATE: 09/05/2008
DRAWN BY:................NAC/JQC
CHECKED BY: ....EKR
CAD FILE: ....0398-002_FIG 6a XBB

PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002-03
STREET ADDRESS: ....1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:..................................SEATTLE, WASHINGTON

REGION:





APPROXIMATE HORIZONTAL SCALE IN FEET 1" = 60'
APPROXIMATE VERTICAL SCALE IN FEET 1" = 7.5'

FIGURE 6a
GEOLOGIC CROSS SECTION: B - B'

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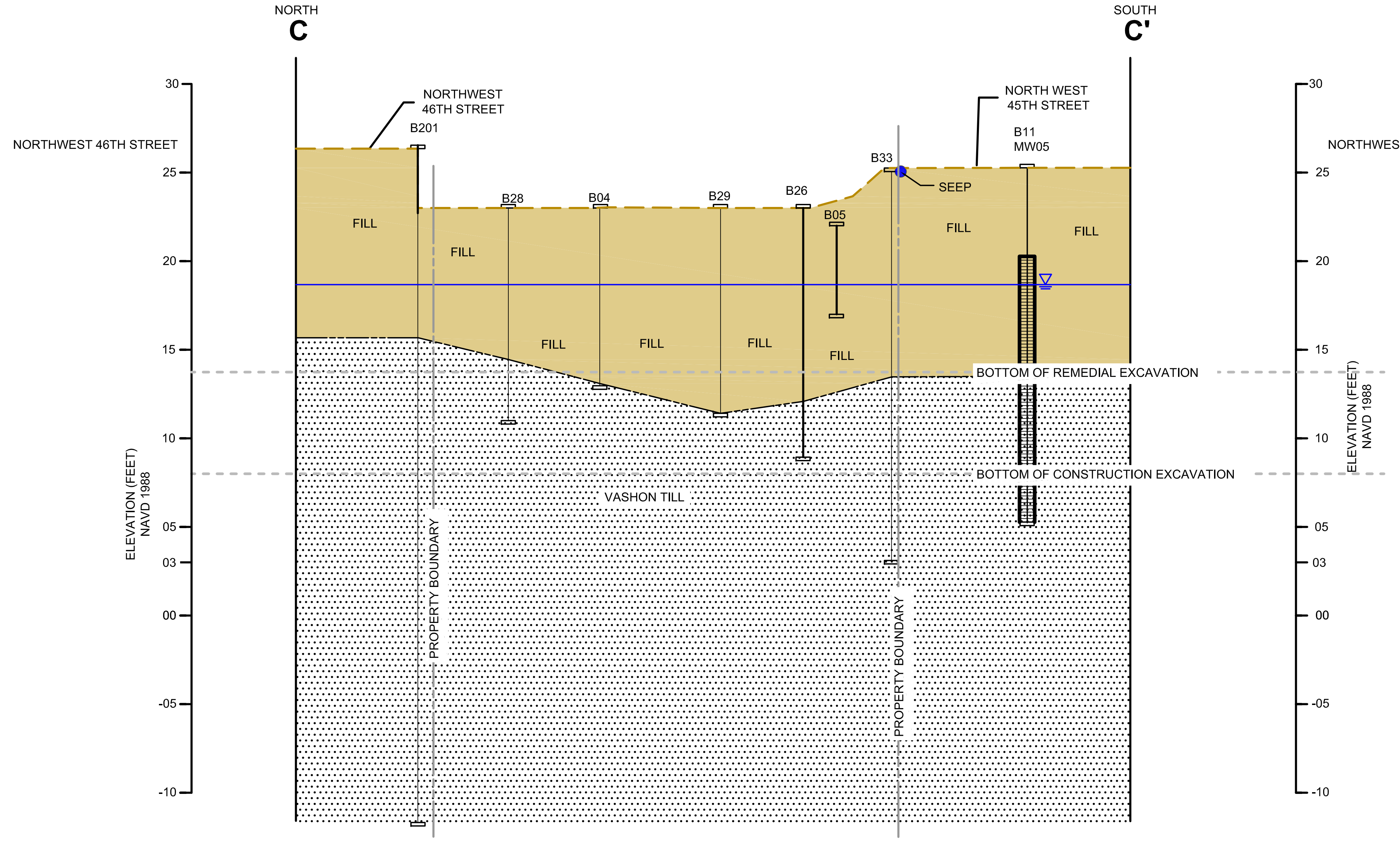
\\Sounddc\SES CURRENT PROJECTS\0398 Ballard\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 XBB.dwg



LEGEND

- GROUND SURFACE
- SCREENED INTERVAL
- APPROXIMATE WATER TABLE ELEVATION (DECEMBER 2007)
- APPROXIMATE FILL/NATIVE TILL INTERFACE

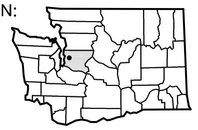
NOTE:
1) VERTICAL SCALE EXAGGERATED 8X
2) WELLS ARE OFFSET FROM THE TRANSECT. DATA PRESENTED ON THIS CROSS-SECTION ARE APPROXIMATE
3) FILL: PREDOMINANTLY SAND AND SILT WITH VARIABLE AMOUNTS OF GRAVEL AND CLAY; MISCELLANEOUS ORGANIC DEBRIS (e.g., WOOD AND BRICK) IN PLACES
4) VASHON TILL: GENERALLY SILT AND SILTY SAND WITH TRACE GRAVEL AND CLAY

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 09/10/2008
DRAWN BY:................JQC/NAC
CHECKED BY: ....EKR
CAD FILE: ....0398-002_FIG 6b XCC

PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002-03
STREET ADDRESS:......................1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:..................................SEATTLE, WASHINGTON

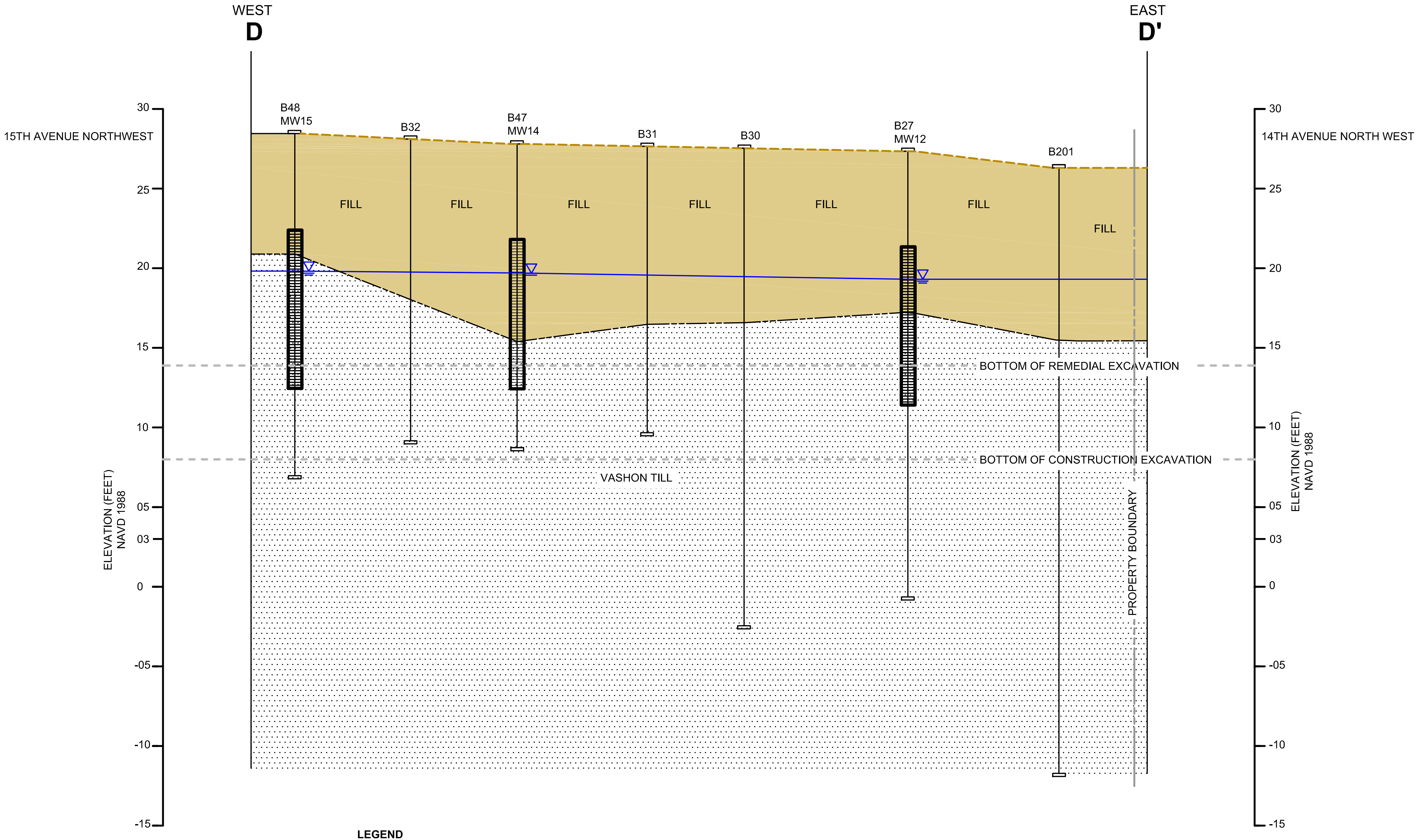
REGION:



0 30 60 120

APPROXIMATE HORIZONTAL SCALE IN FEET 1" = 60'
APPROXIMATE VERTICAL SCALE IN FEET 1" = 7.5'

FIGURE 6b
GEOLOGIC CROSS SECTION: C - C'



LEGEND

- GROUND SURFACE
- SCREENED INTERVAL
- APPROXIMATE WATER TABLE ELEVATION (DECEMBER 2007)
- APPROXIMATE FILL/NATIVE TILL INTERFACE

NOTE:

1) VERTICAL SCALE EXAGGERATED 8X
2) WELLS ARE OFFSET FROM THE TRANSECT. DATA PRESENTED ON THIS CROSS-SECTION ARE APPROXIMATE
3) FILL: PREDOMINANTLY SAND AND SILT WITH VARIABLE AMOUNTS OF GRAVEL AND CLAY; MISCELLANEOUS ORGANIC DEBRIS (e.g., WOOD AND BRICK) IN PLACES
4) VASHON TILL: GENERALLY SILT AND SILTY SAND WITH TRACE GRAVEL AND CLAY

SOUND ENVIRONMENTAL STRATEGIES
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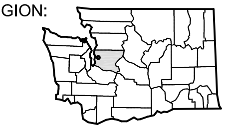
DATE: 09/05/2008
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG6c XDD

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002-03
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:

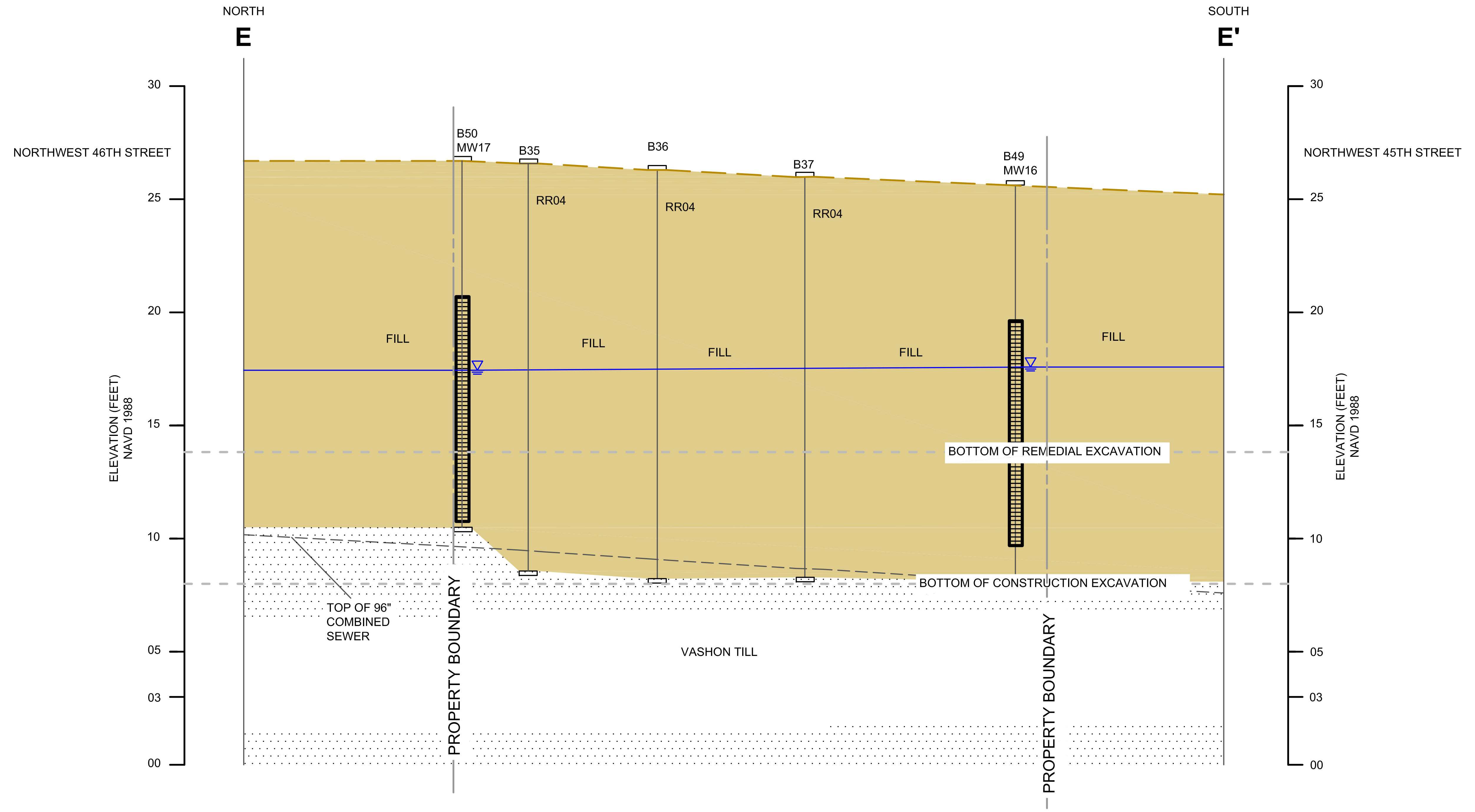


0 15 30 60 120
APPROXIMATE HORIZONTAL SCALE IN FEET 1" = 60'
APPROXIMATE VERTICAL SCALE IN FEET 1" = 7.5'

FIGURE 6c
GEOLOGIC CROSS SECTION: D - D'

9/11/2008

\\Sounddc\SES CURRENT PROJECTS\0398 Ballard Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 XDD.dwg



LEGEND

GROUND SURFACE

SCREENED INTERVAL

APPROXIMATE WATER TABLE ELEVATION (DECEMBER 2007)

NOTE:

1) VERTICAL SCALE EXAGGERATED 8X
2) WELLS ARE OFFSET FROM THE TRANSECT. DATA PRESENTED ON THIS CROSS-SECTION ARE APPROXIMATE
3) FILL: PREDOMINANTLY SAND AND SILT WITH VARIABLE AMOUNTS OF GRAVEL AND CLAY; MISCELLANEOUS ORGANIC DEBRIS (e.g., WOOD AND BRICK) IN PLACES
4) VASHON TILL: GENERALLY SILT AND SILTY SAND WITH TRACE GRAVEL AND CLAY

SOUND ENVIRONMENTAL STRATEGIES
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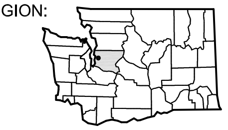
DATE: 09/05/2008
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG 6d XEE

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002-03
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:



0 10 20 40 80

APPROXIMATE HORIZONTAL SCALE IN FEET 1" = 40'
APPROXIMATE VERTICAL SCALE IN FEET 1" = 7.5'

FIGURE 6d
GEOLOGIC CROSS SECTION: E - E'

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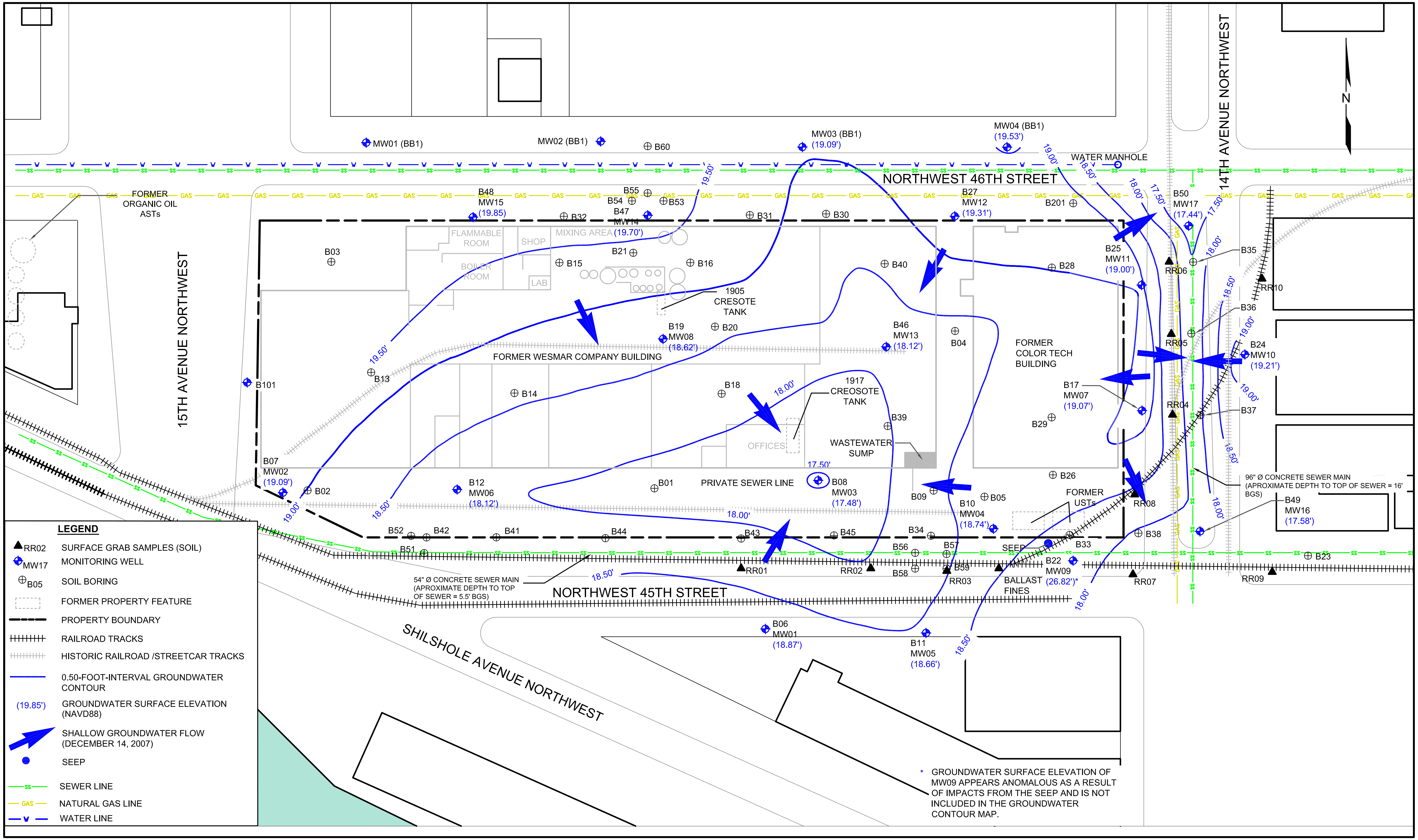
\\Sounddc\SES CURRENT PROJECTS\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 CM.dwg



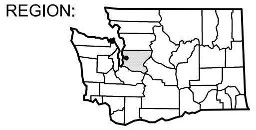
* GROUNDWATER SURFACE ELEVATION OF MW09 APPEARS ANOMALOUS AS A RESULT OF IMPACTS FROM THE SEEP AND IS NOT INCLUDED IN THE GROUNDWATER CONTOUR MAP.

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG7 CM

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:

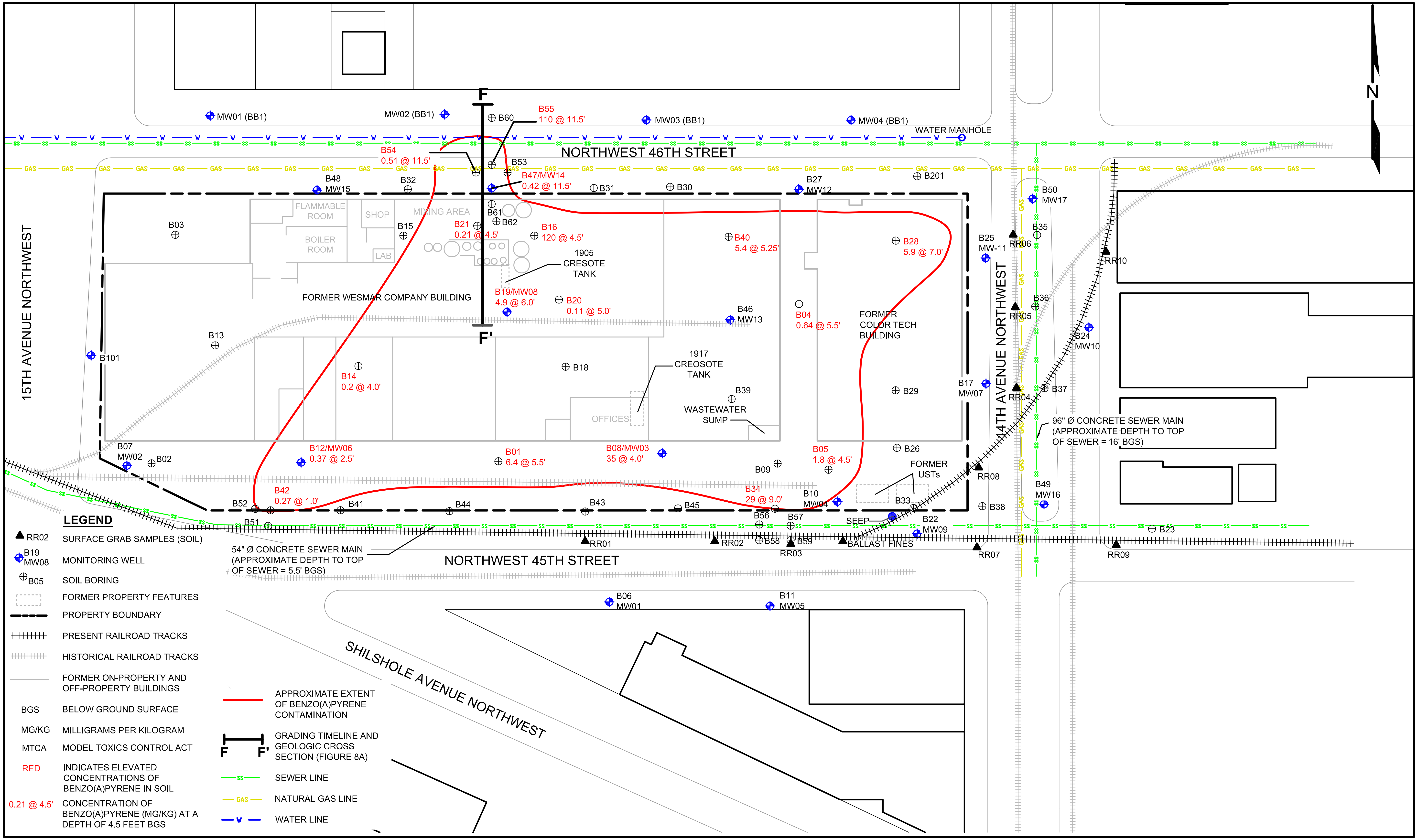


0 15 30 60 120
APPROXIMATE SCALE IN FEET 1" = 60'

FIGURE 7
GROUNDWATER CONTOUR MAP
(DECEMBER 14, 2007)

1/15/2010

\\Sounddc\SES CURRENT PROJECTS\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 BPSD.dwg



SOUND ENVIRONMENTAL STRATEGIES
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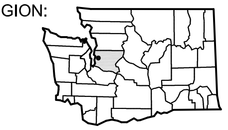
DATE: 01/15/10
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG8 BPSD

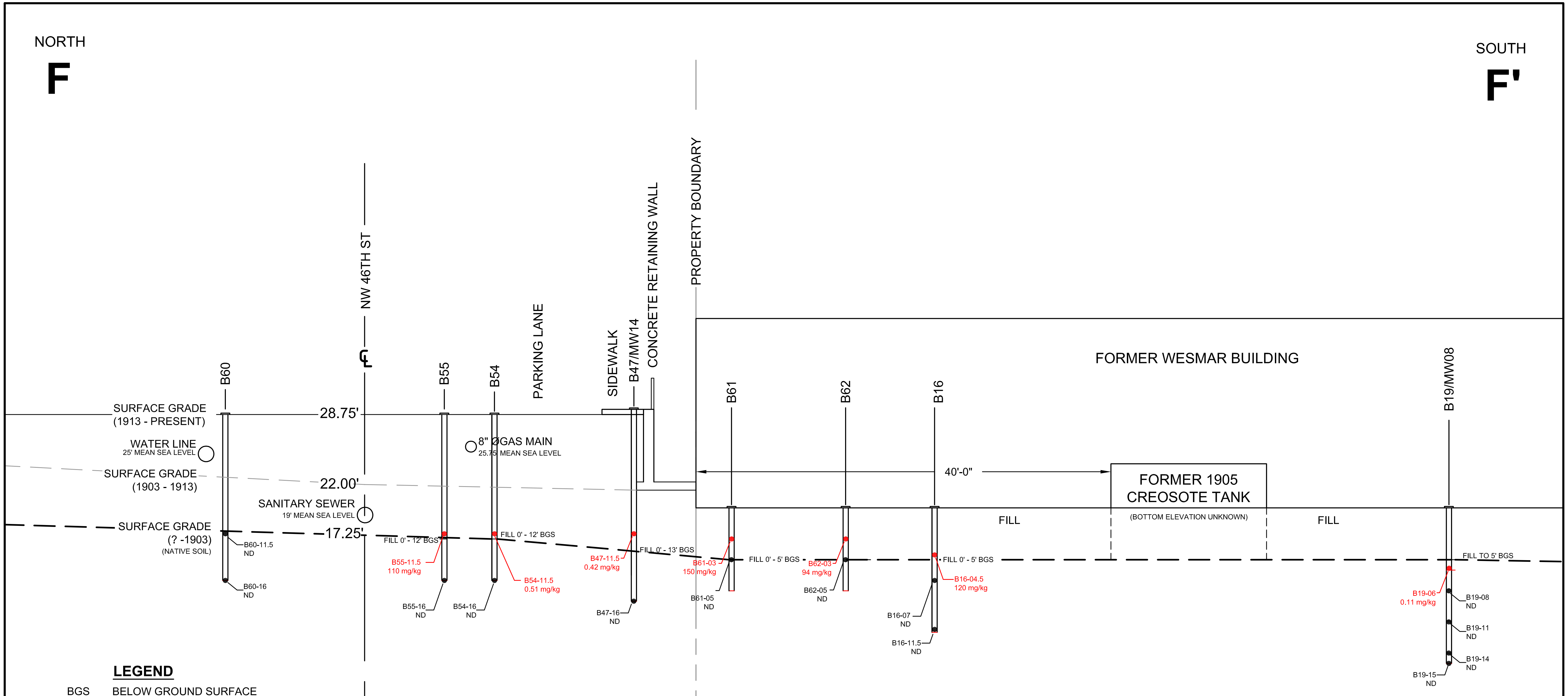
PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:



0 15 30 60 120
APPROXIMATE SCALE IN FEET 1" = 60'

FIGURE 8
BENZO(A)PYRENE IN SOIL



LEGEND

BGS	BELOW GROUND SURFACE
mg/kg	MILIGRAMS PER KILOGRAM
ND	CONCENTRATIONS OF BENZO(A)PYRENE ARE BELOW LABORATORY DETECTION LIMITS
℄	CENTER LINE
B19-06	SAMPLE COLLECTED FROM BORING 19 AT 6 FEET BGS
RED	INDICATES A CONCENTRATION OF BENZO(A)PYRENE IN EXCEEDANCE OF THE MTCA METHOD A CLEANUP LEVEL

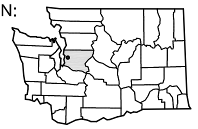
*VERTICAL DATUM: NAVD88

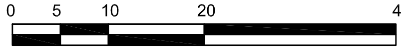
SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG8a XFF

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398_002
STREET ADDRESS: 1401 & 1451 NW 46TH ST
CITY, STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET 1" = 20'

FIGURE 8a
GRADING TIMELINE
GEOLOGIC CROSS SECTION F-F'

P:\0398 Ballard - Ranras\0398-002 Ballard Blocks 2 (Wesmar)\Technical\CAD\2008 RIFS_CAP Report_jqc\0398-002_FIG8a XFF_F.dwg
1/15/2010

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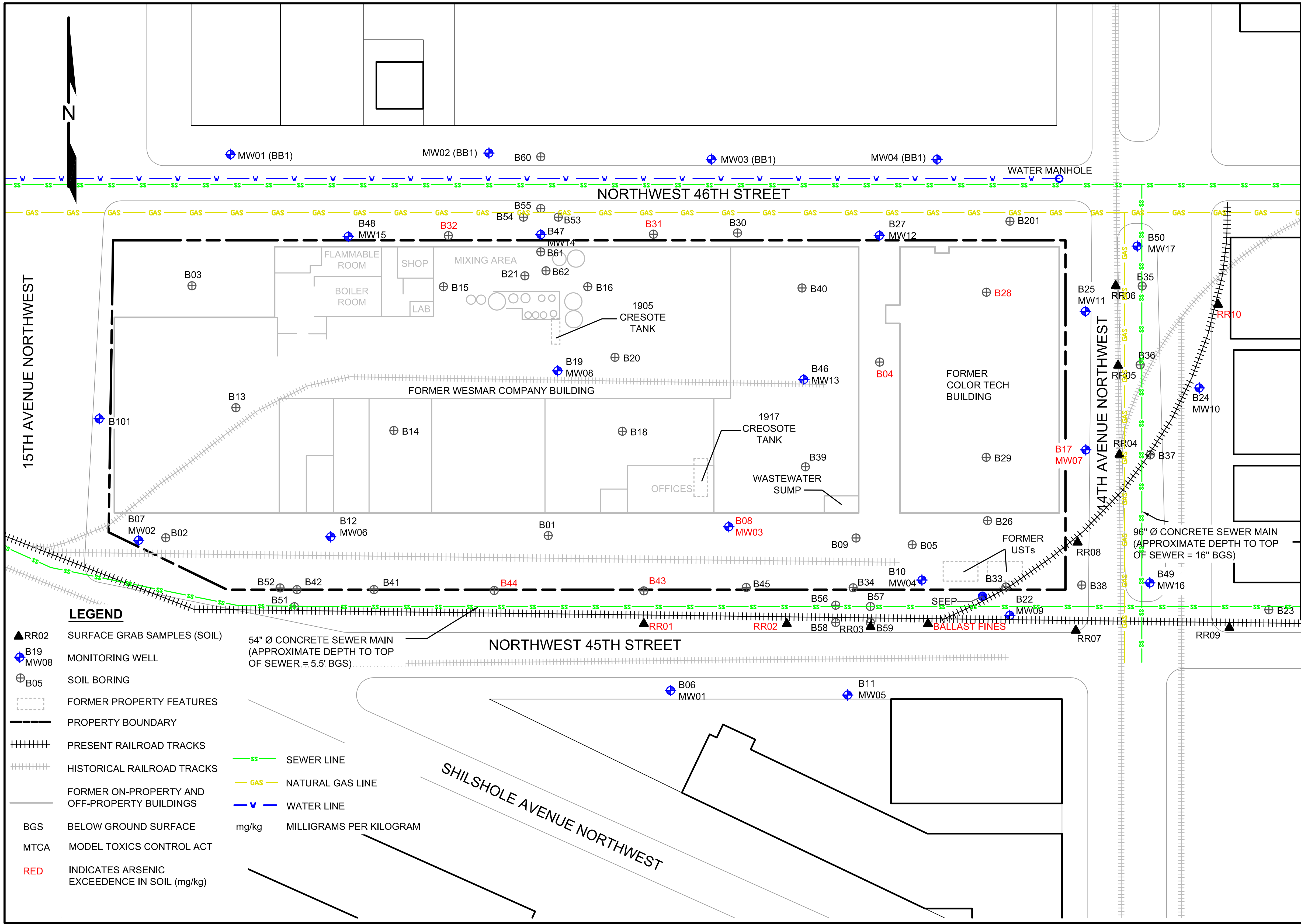


LEGEND

▲ RR02	SURFACE GRAB SAMPLES (SOIL)
⊕ B19 MW08	MONITORING WELL
⊕ B05	SOIL BORING
⬚	FORMER PROPERTY FEATURES
▬ ▬	PROPERTY BOUNDARY
++++++++	PRESENT RAILROAD TRACKS
++++++++	HISTORICAL RAILROAD TRACKS
───	FORMER ON-PROPERTY AND OFF-PROPERTY BUILDINGS
BGS	BELOW GROUND SURFACE
MTCA	MODEL TOXICS CONTROL ACT
RED	INDICATES ARSENIC EXCEEDENCE IN SOIL (mg/kg)
— SS —	SEWER LINE
— GAS —	NATURAL GAS LINE
— V —	WATER LINE
mg/kg	MILLIGRAMS PER KILOGRAM

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic (mg/kg)
B04-5.5	09/28/05	5.5	**25**
B08-4.0	09/07/06	4	**23.4**
B08-11.5	09/07/06	11.5	2.64
B08-19.5	09/07/06	19.5	**20.3**
B17-7.0	09/12/06	7	<1
B17-13.5	09/12/06	13.5	**21.4**
B17-25	09/12/06	25	3.36
Ballast-Fines	11/17/06	0.5	**76.2**
B28-07	11/20/07	7	**23.6**
B28-12	11/20/07	12	1.37
B31-04	11/20/07	4	1.88
B31-11.5	11/20/07	11.5	**20.4**
B31-14	11/20/07	14	1.18
B32-02	11/20/07	2	<1
B32-11	11/20/07	11	**21.8**
B32-15	11/20/07	15	5.42
B43-01	11/21/07	1	7.95
B43-10	11/21/07	10	2.12
B43-17	11/21/07	17	**66.0**
B44-01	11/21/07	1	**45.4**
B44-11	11/21/07	11	2.02
B44-16	11/21/07	16	<1
RR01-0.5	11/20/07	0.5	**87.8**
RR01-1.25	11/20/07	1.25	13.8
RR01-02	11/20/07	2.0	3.63
RR02-0.5	11/20/07	0.5	**93.3**
RR02-1.25	11/20/07	1.25	**28.9**
RR02-02	11/20/07	2.0	6.39
RR04-0.5	11/20/07	0.5	6.16
RR04-1.25	11/20/07	1.25	12.5
RR04-02	11/20/07	2.0	**28.6**
RR10-0.5	11/21/07	0.5	**32.2**
RR10-1.25	11/21/07	1.25	2.52
RR10-02	11/21/07	2.0	2.20
MTCA Method A Cleanup Levels			20

NOTE:

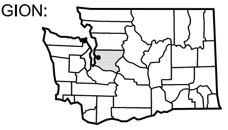
TABLE ONLY INCLUDES SOIL BORING LOCATIONS WITH AT LEAST ONE ARSENIC CONCENTRATION THAT EXCEEDS THE CLEANUP LEVEL

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY:................NAC/JQC
CHECKED BY: ....EKR
CAD FILE: ....0398-002_FIG9 ARSD

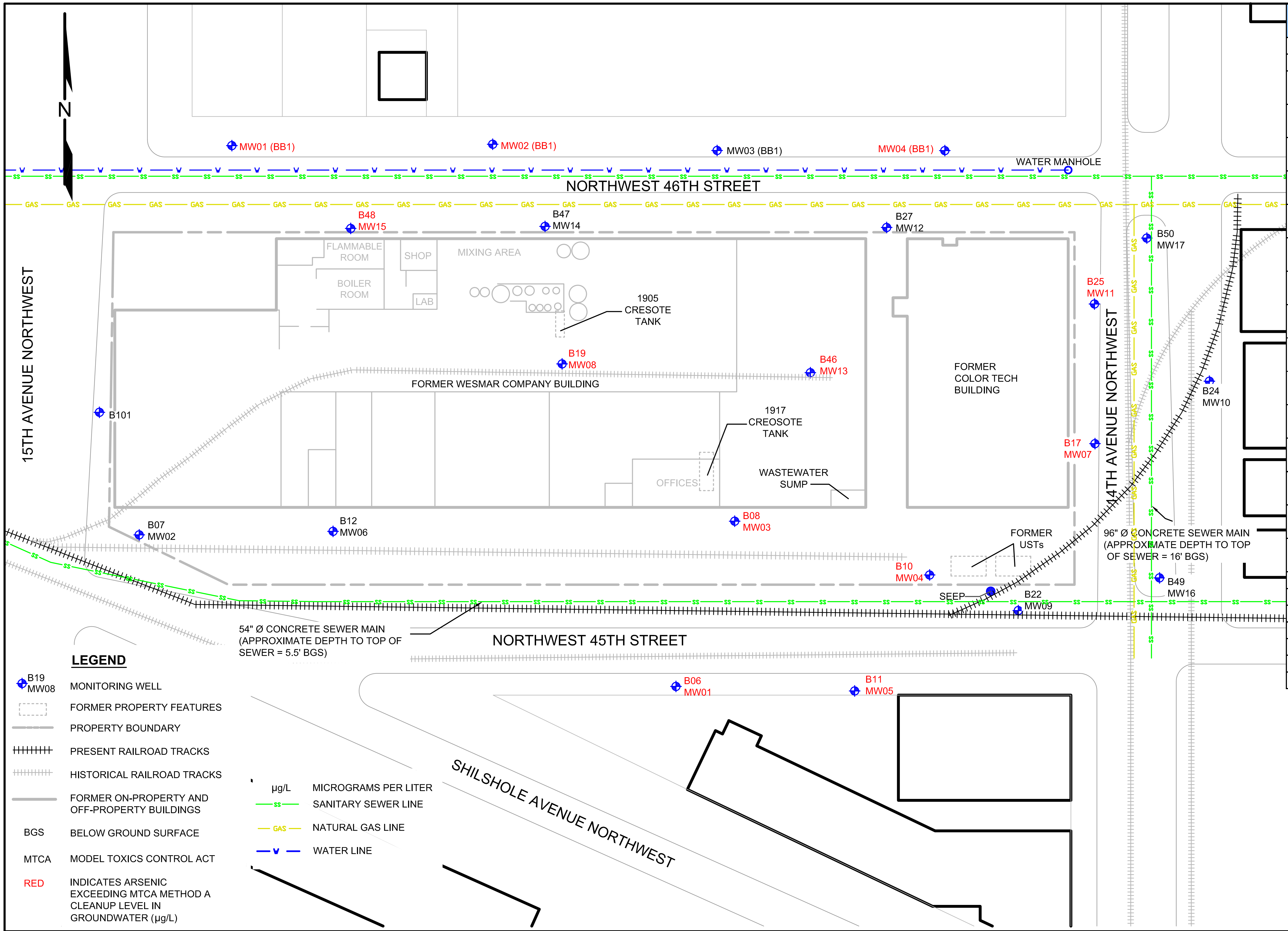
PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002
STREET ADDRESS:......................1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:..................................SEATTLE, WASHINGTON

REGION:



0 15 30 60 120
APPROXIMATE SCALE IN FEET 1" = 60'

FIGURE 9
ARSENIC IN SOIL



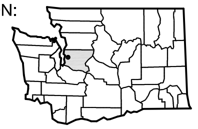
Well ID	Sample Date	Arsenic (ug/L)	
		Total	Dissolved
Seep	06/13/07	1.41	1.59
Tapwater	06/13/07	<1	<1
MW01 (BB1)	06/20/07	**130**	--
	12/14/07	--	--
MW02 (BB1)	06/20/07	**17.9**	4.4
	12/14/07	--	--
MW03 (BB1)	06/20/07	<1	<1
	12/14/07	--	--
MW04 (BB1)	06/13/07	**8.51**	**9.2**
	12/14/07	--	--
MW01	06/13/07	**19.2**	**20.4**
	12/06/07	**16.7**	**16.5**
MW02	06/13/07	4.36	3.31
	12/06/07	1.35	1.03
MW03	06/13/07	**267**	**538**
	12/06/07	**502**	**456**
MW04	06/13/07	**247**	**277**
	12/07/07	**151**	**145**
MW05	06/13/07	**17.8**	**22.7**
	12/06/07	**130**	**113**
MW06	06/13/07	4.08	4.09
	12/06/07	4.10	3.96
MW07	06/13/07	**1,150**	**1,120**
	12/06/07	**613**	**596**
MW08	06/13/07	**9.97**	**9.04**
	12/06/07	**6.35**	**6.12**
MW09	06/13/07	1.11	<1
	12/07/07	<1	<1
MW10	06/13/07	1.33	1.2
	12/06/07	<1	<1
MW11	06/13/07	**44.7**	**43.4**
	12/06/07	**33.7**	**35.6**
MW12	12/07/07	2.34	1.97
MW13	12/07/07	**25.1**	**25.7**
MW14	12/07/07	1.64	1.46
MW15	12/07/07	**7.36**	**7.42**
MW16	12/07/07	**6.91**	**6.64**
MW17	12/07/07	1.6	1.51
MTCA Method A Cleanup Levels		5	

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY:.................NAC/JQC
CHECKED BY: ....EKR
CAD FILE: ....0398-002_FIG10 ARGW

PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002
STREET ADDRESS:......................1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:...................................SEATTLE, WASHINGTON

REGION:



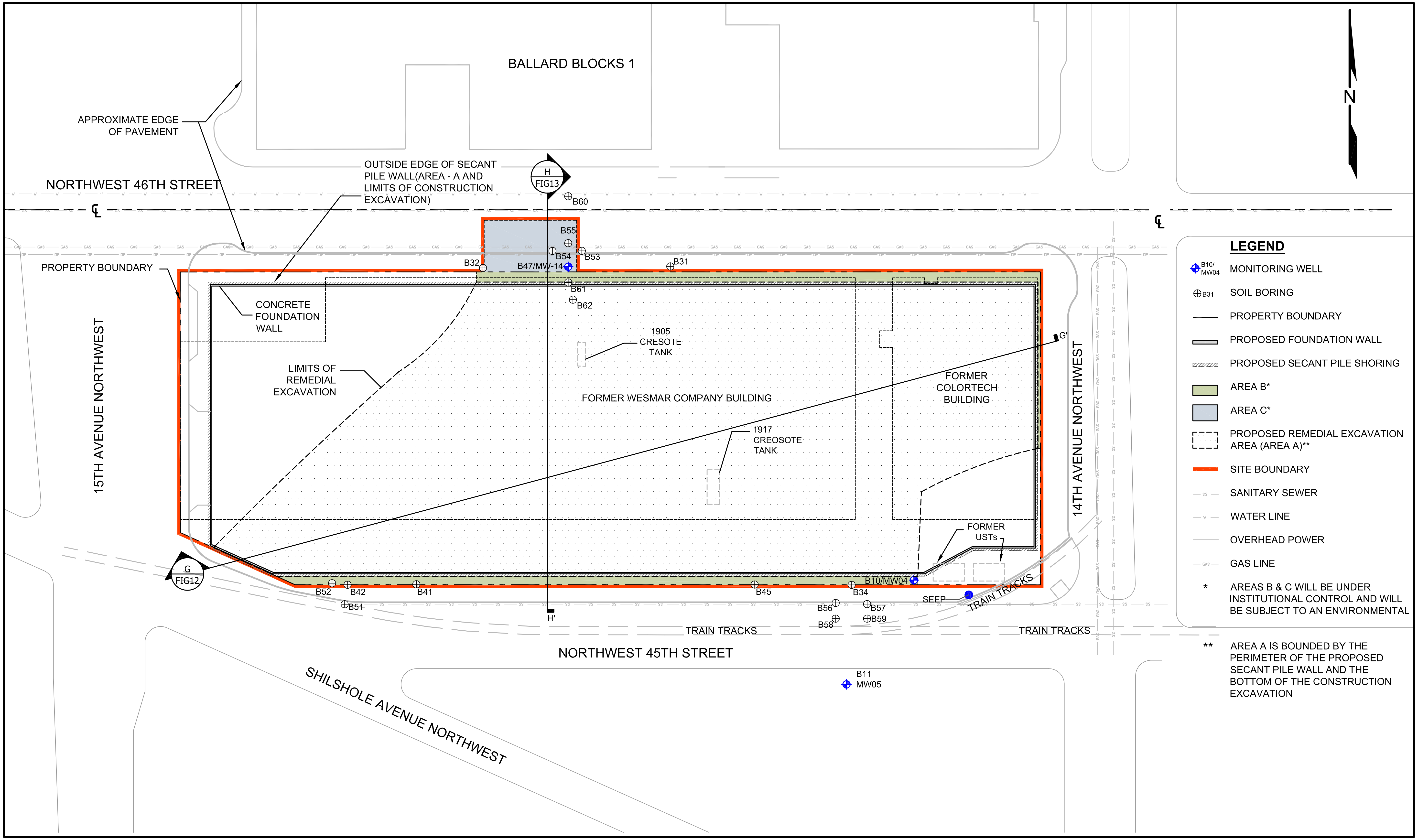
0 15 30 60 120
APPROXIMATE SCALE IN FEET

FIGURE 10
ARSENIC IN GROUNDWATER

1/18/2010
P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398-002 FIG10 ARGW F.DWG

1/18/2010

\\Sounddc\SES CURRENT PROJECTS\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Figures\DRAFTS\0398-002 RA.dwg

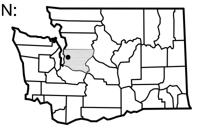


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY:................NAC/JQC
CHECKED BY: ....EKR
CAD FILE: ....0398-002_FIG11 SBD

PROJECT NAME: ....FORMER WESMAR PROPERTY
SES PROJECT NUMBER:............0398-002
STREET ADDRESS:.....................1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE:..................................SEATTLE, WASHINGTON

REGION:



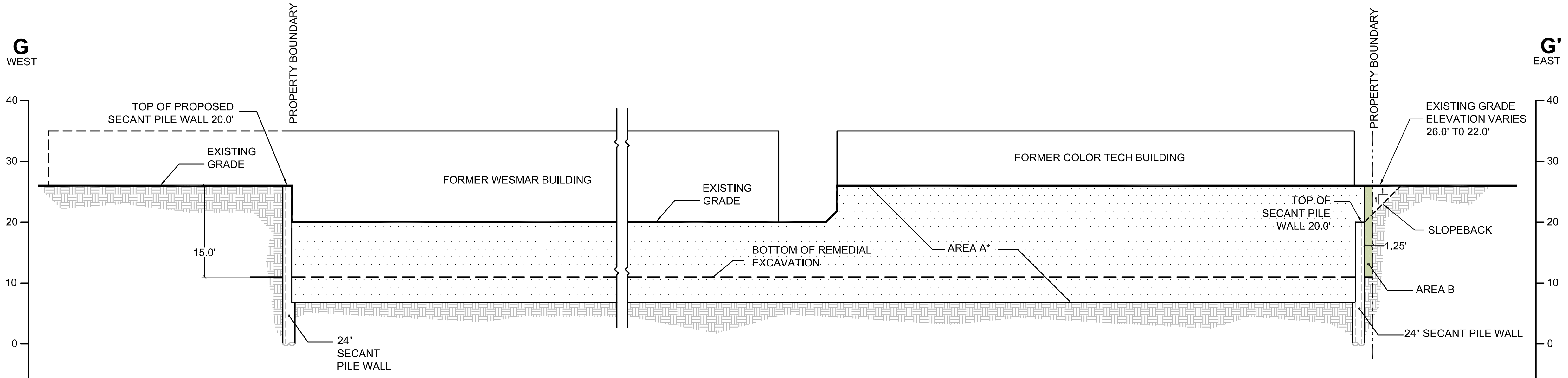
0 15 30 60 120

APPROXIMATE SCALE IN FEET

FIGURE 11

SITE BOUNDARY DEFINITION

SOUNDENVIRONMENTAL.COM



LEGEND

-·-·- PROPERTY BOUNDARY

▨ AREA A*

🟩 AREA B**

* AREA A IS BOUNDED BY THE PERIMETER OF THE PROPOSED SECANT PILE WALL AND THE BOTTOM OF THE CONSTRUCTION EXCAVATION

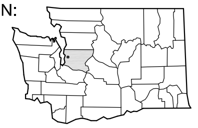
** AREA B WILL BE UNDER INSTITUTIONAL CONTROL AND WILL BE SUBJECT TO AN ENVIRONMENTAL COVENANT

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB/JQC
CHECKED BY: CMC
CAD FILE: 0398_002_FIG12 XGG

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 10 20 40
APPROXIMATE SCALE IN FEET

FIGURE 12
CROSS SECTION G - G'

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398-002 FIG12 XGG F.DWG

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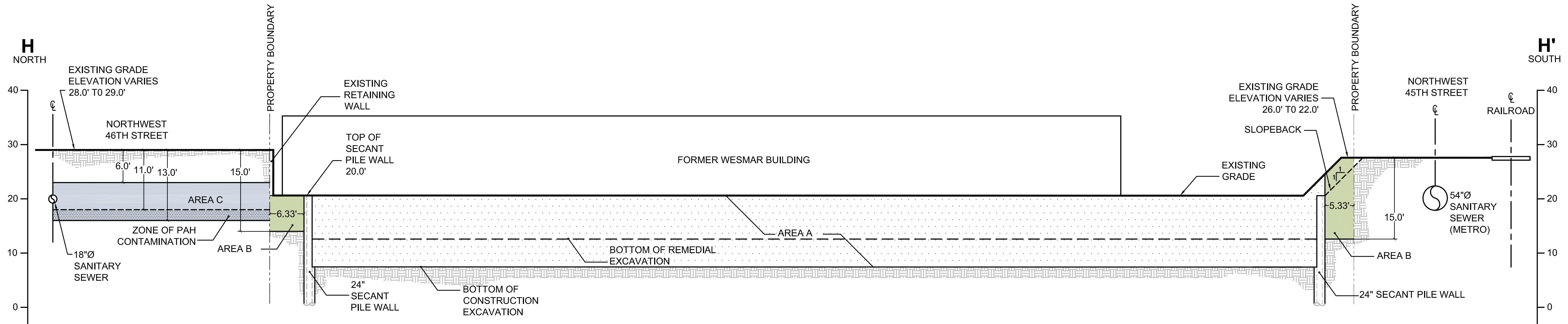

LEGEND

-·-·- PROPERTY BOUNDARY

▒ AREA A*

🟩 AREA B**

🟦 AREA C**

* AREA A IS BOUNDED BY THE PERIMETER OF THE PROPOSED SECANT PILE WALL AND THE BOTTOM OF THE CONSTRUCTION EXCAVATION

** AREAS B&C WILL BE UNDER INSTITUTIONAL CONTROL AND WILL BE SUBJECT TO AN ENVIRONMENTAL COVENANT

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB/JQC
CHECKED BY: CMC
CAD FILE: 0398-002_FIG13 XHH

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:

0 10 20 40
APPROXIMATE SCALE IN FEET

FIGURE 13
CROSS SECTION H - H'

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398-002 FIG13 XHH F.DWG
1/18/2010

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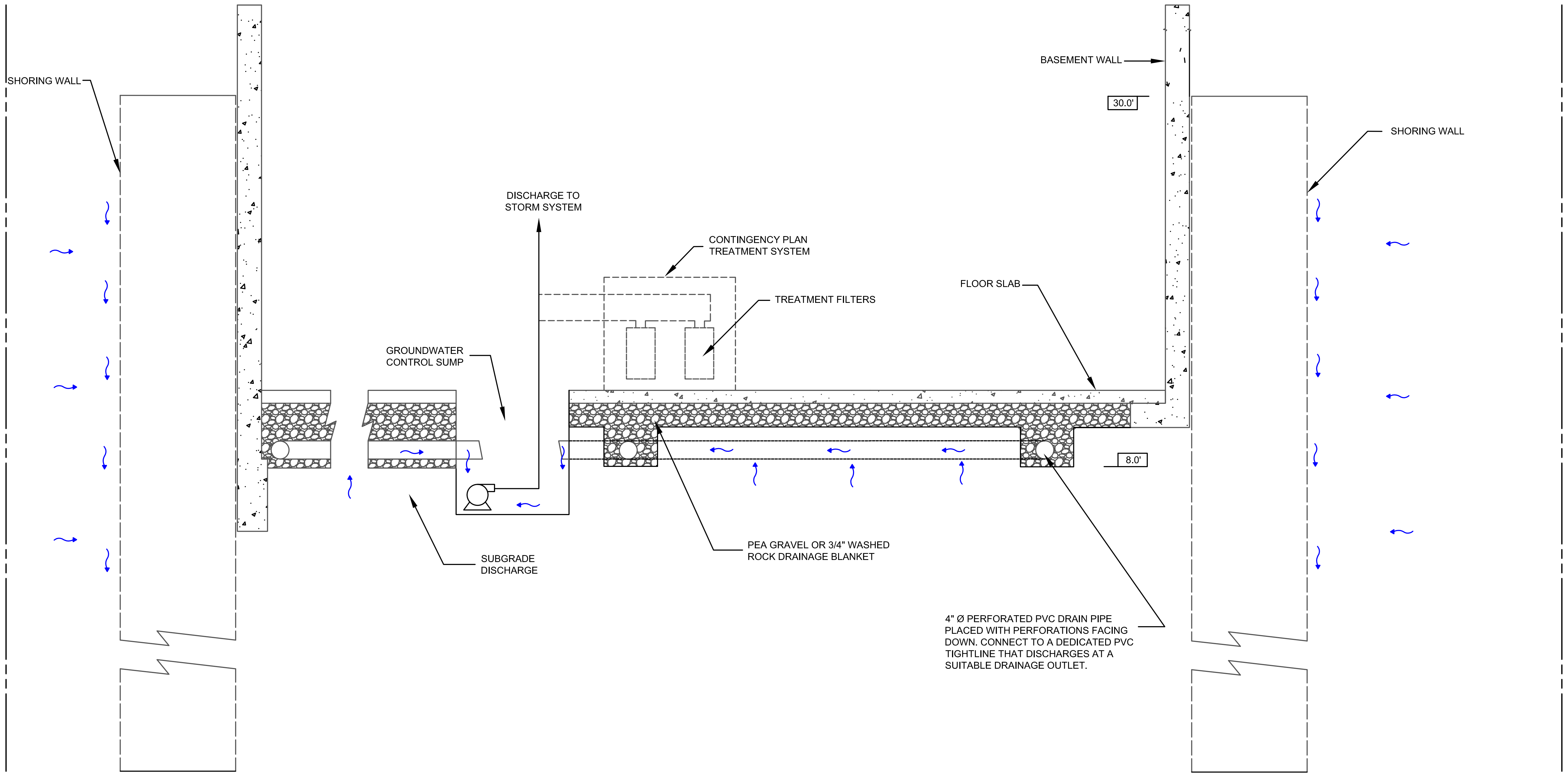
1/18/2010

LEGEND

—·—·—	PROPERTY BOUNDARY
⟶	WATER FLOW DIRECTION
8.0'	ESTIMATED ELEVATION (NAVD88)

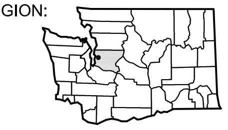


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: JQC/NAC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG14 CSS_1a

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NW 46TH STREET
CITY: SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

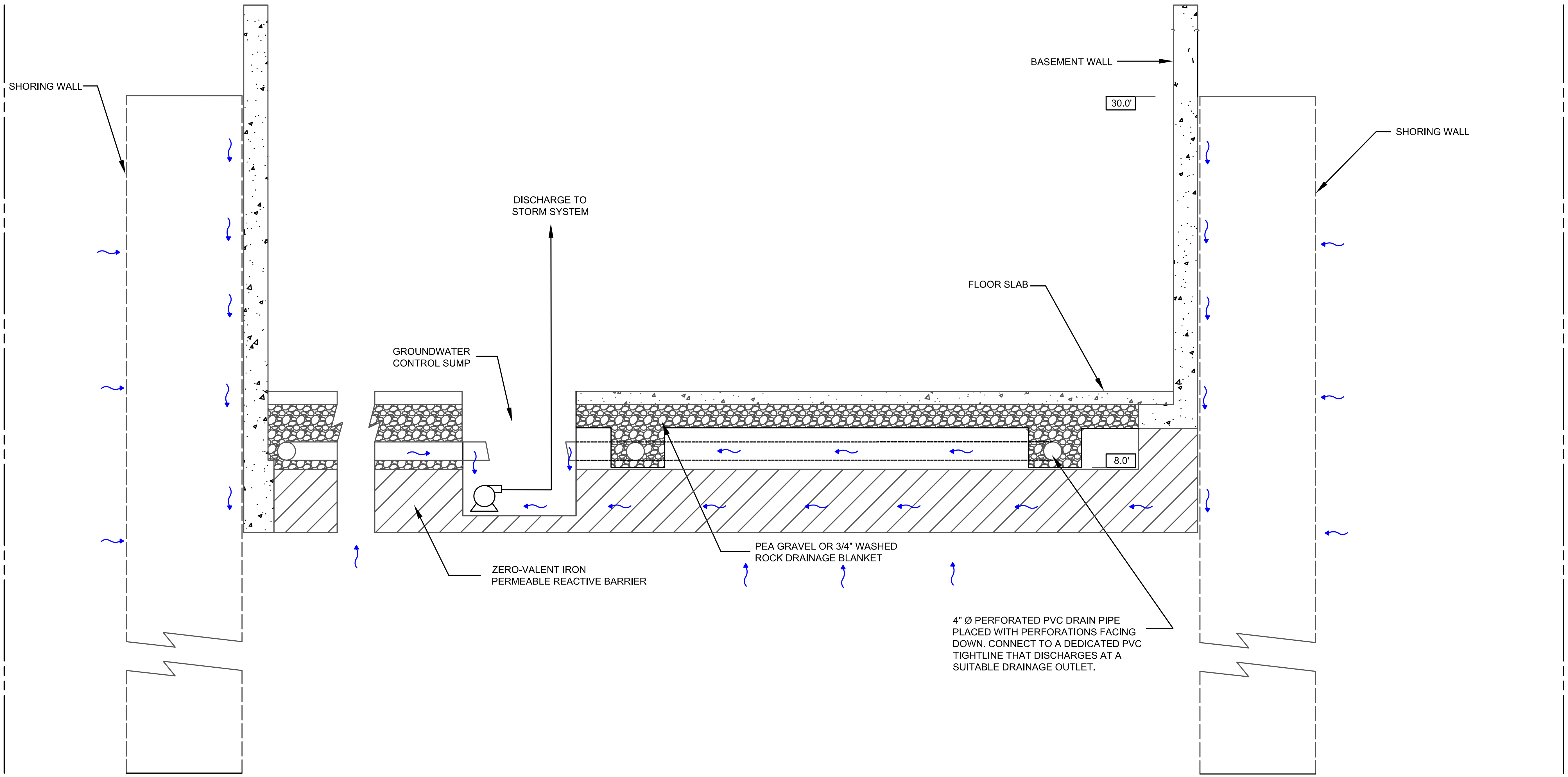
FIGURE 14
CONCEPTUAL ALTERNATIVE 1a

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG14 CSS_1A_F.DWG

SOUNDENVIRONMENTAL.COM

LEGEND

- PROPERTY BOUNDARY
- WATER FLOW DIRECTION
- 8.0' ESTIMATED ELEVATION (NAVD88)

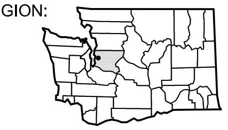


SOUNDENVIRONMENTAL.COM

DATE:	01/15/10
DRAWN BY:	JQC/NAC
CHECKED BY:	TWM
CAD FILE:	0398-002_FIG15 CSS_2a

PROJECT NAME:	FORMER WESMAR PROPERTY
SES PROJECT NUMBER:	0398-002
STREET ADDRESS:	1401 & 1451 NW 46TH STREET
CITY:	SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

FIGURE 15
CONCEPTUAL ALTERNATIVE 2a

1/18/2010

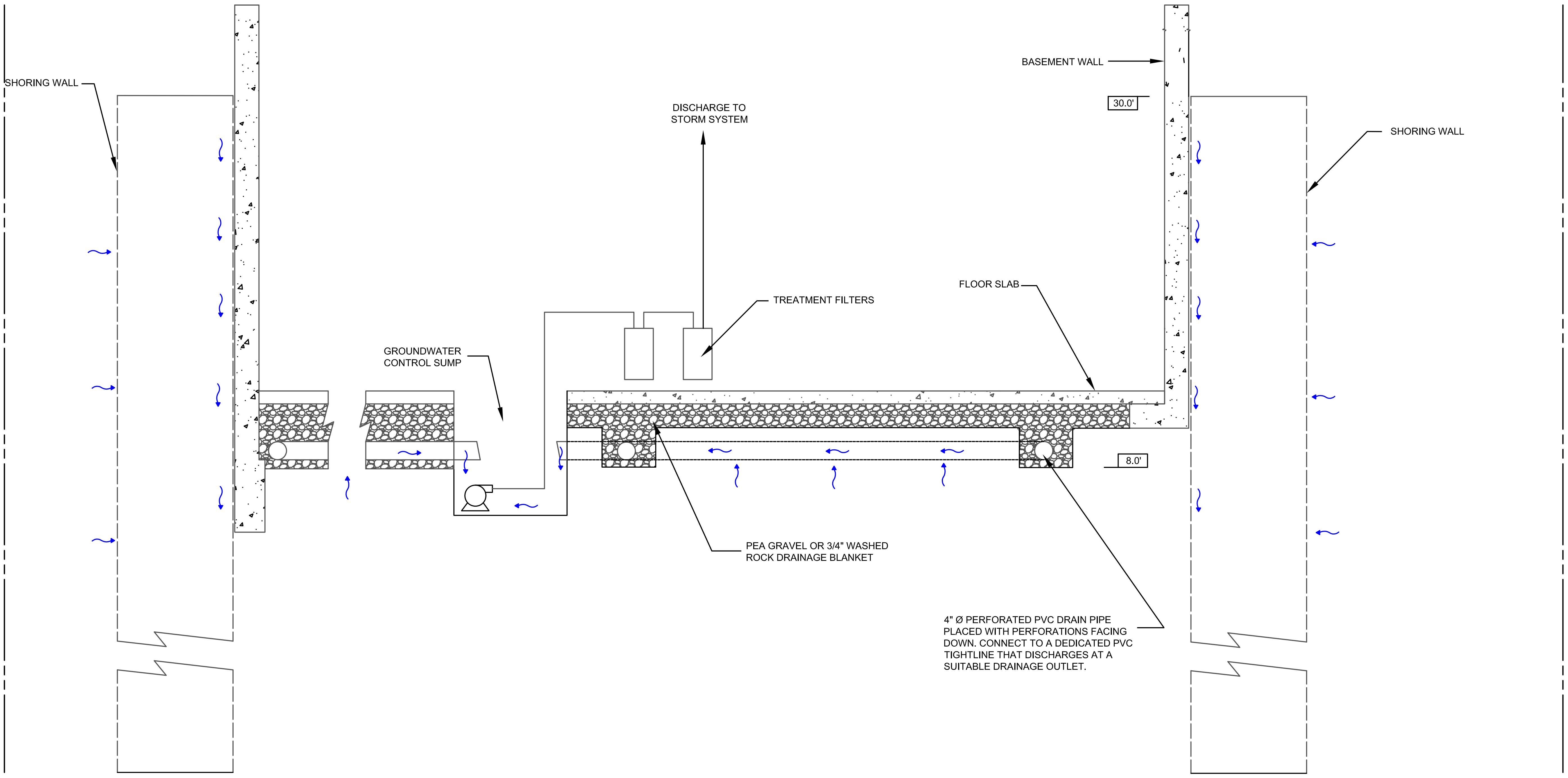
P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG15 CSS_2A_F.DWG

LEGEND

—··— PROPERTY BOUNDARY

⁓→ WATER FLOW DIRECTION

8.0' ESTIMATED ELEVATION (NAVD88)

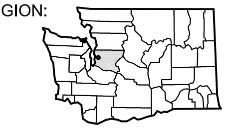


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: JQC/NAC
CHECKED BY: TWM
CAD FILE: 0398-002_FIG16 CSS_3a

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NW 46TH STREET
CITY: SEATTLE, WASHINGTON

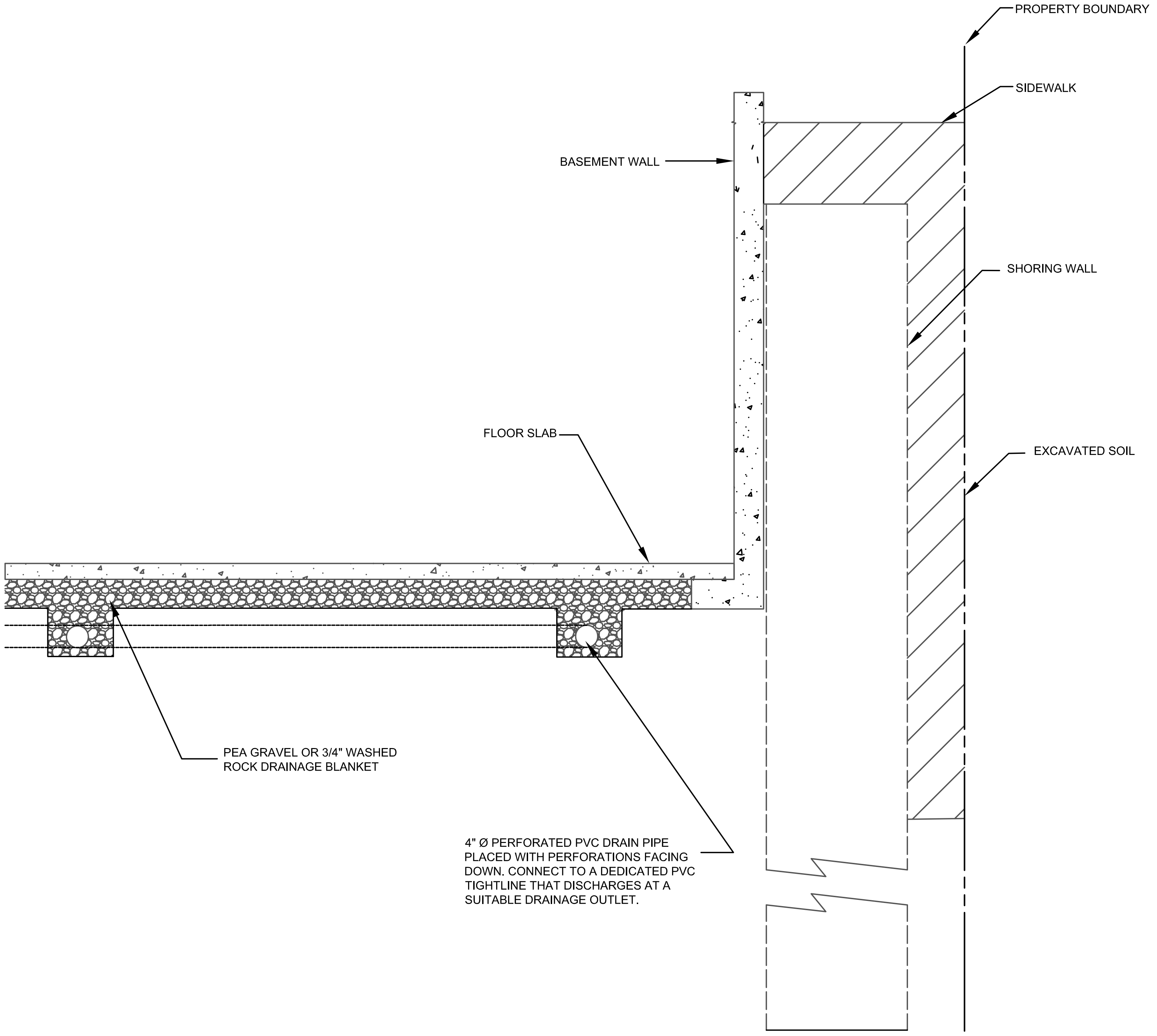
REGION:



NOT TO SCALE

FIGURE 16
CONCEPTUAL ALTERNATIVE 3a

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG16 CSS_3A_F.DWG 1/18/2010

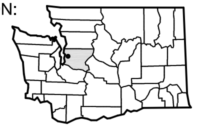


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: JQC/NAC
CHECKED BY: TWM
CAD FILE: 0398-002_FIG17 CSS_1b

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NW 46TH STREET
CITY: SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

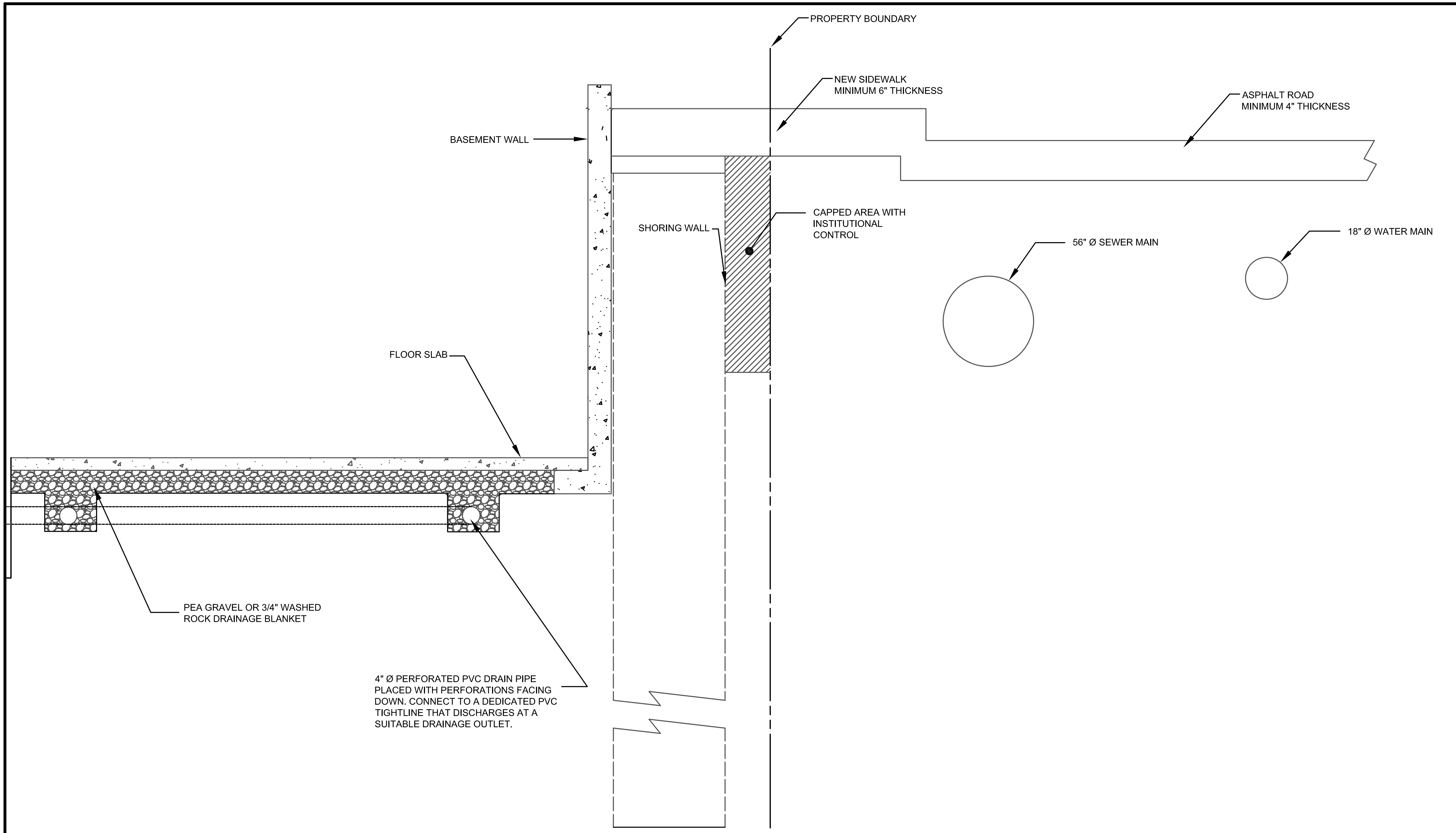
FIGURE 17
CONCEPTUAL ALTERNATIVE 1b

1/15/2010
P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG17 CONCEPTUAL SUB-SLAB DRAINAGE DETAIL_1B_F.DWG

SOUNDENVIRONMENTAL.COM

1/15/2010

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG18 CONCEPTUAL SUB-SLAB DRAINAGE DETAIL_2B_F.DWG

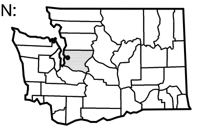


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: JQC/NAC
CHECKED BY: TWM
CAD FILE: 0398-002_FIG18 CSS_2b

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NW 46TH STREET
CITY: SEATTLE, WASHINGTON

REGION:



NOT TO SCALE

FIGURE 18
CONCEPTUAL ALTERNATIVE 2b

SOUNDENVIRONMENTAL.COM

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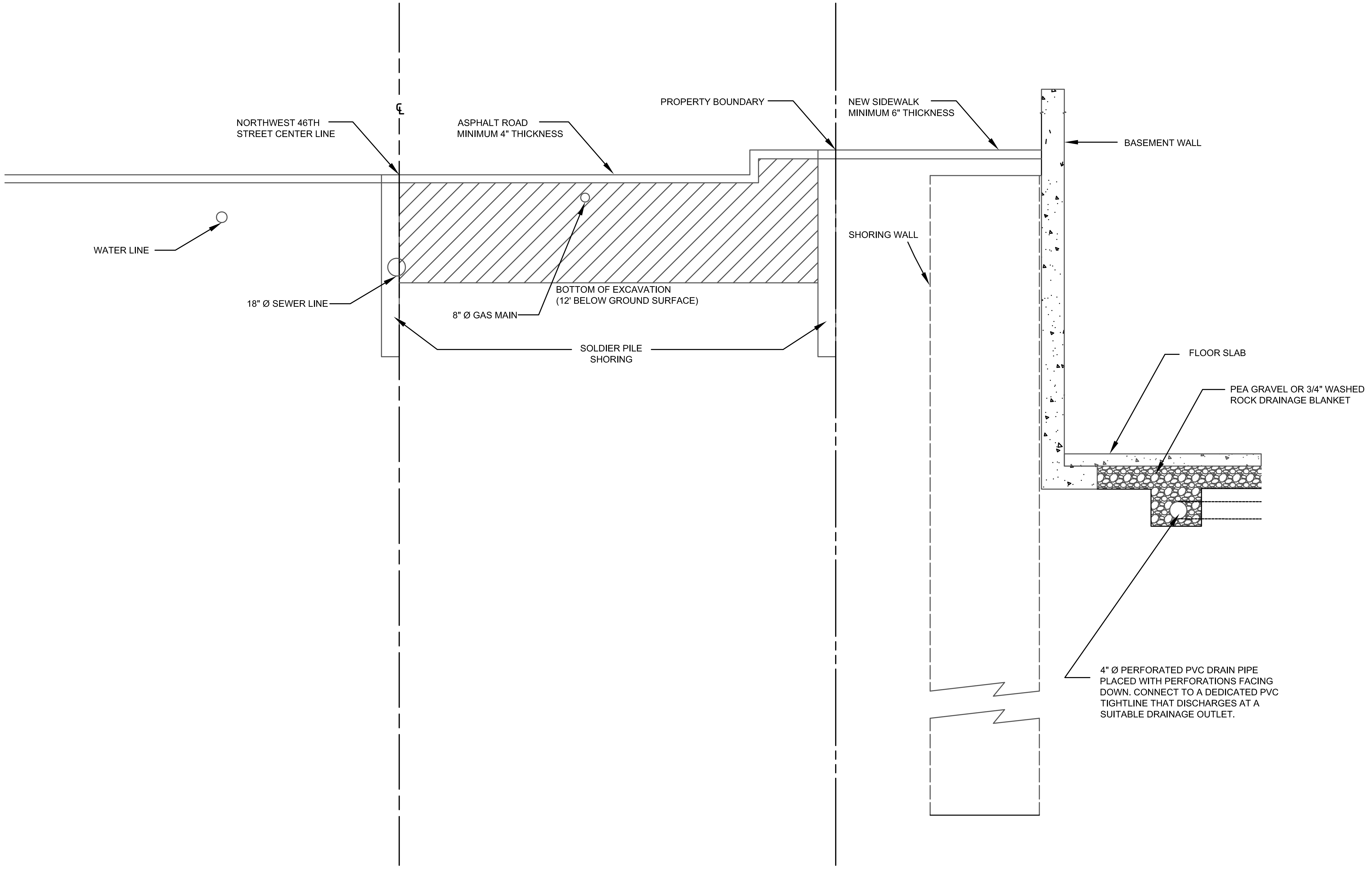
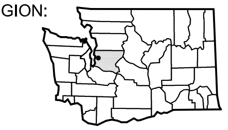


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: JQC/NAC
CHECKED BY: TWM
CAD FILE: 0398-002_FIG19 CSS_1c

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NW 46TH STREET
CITY: SEATTLE, WASHINGTON

REGION:

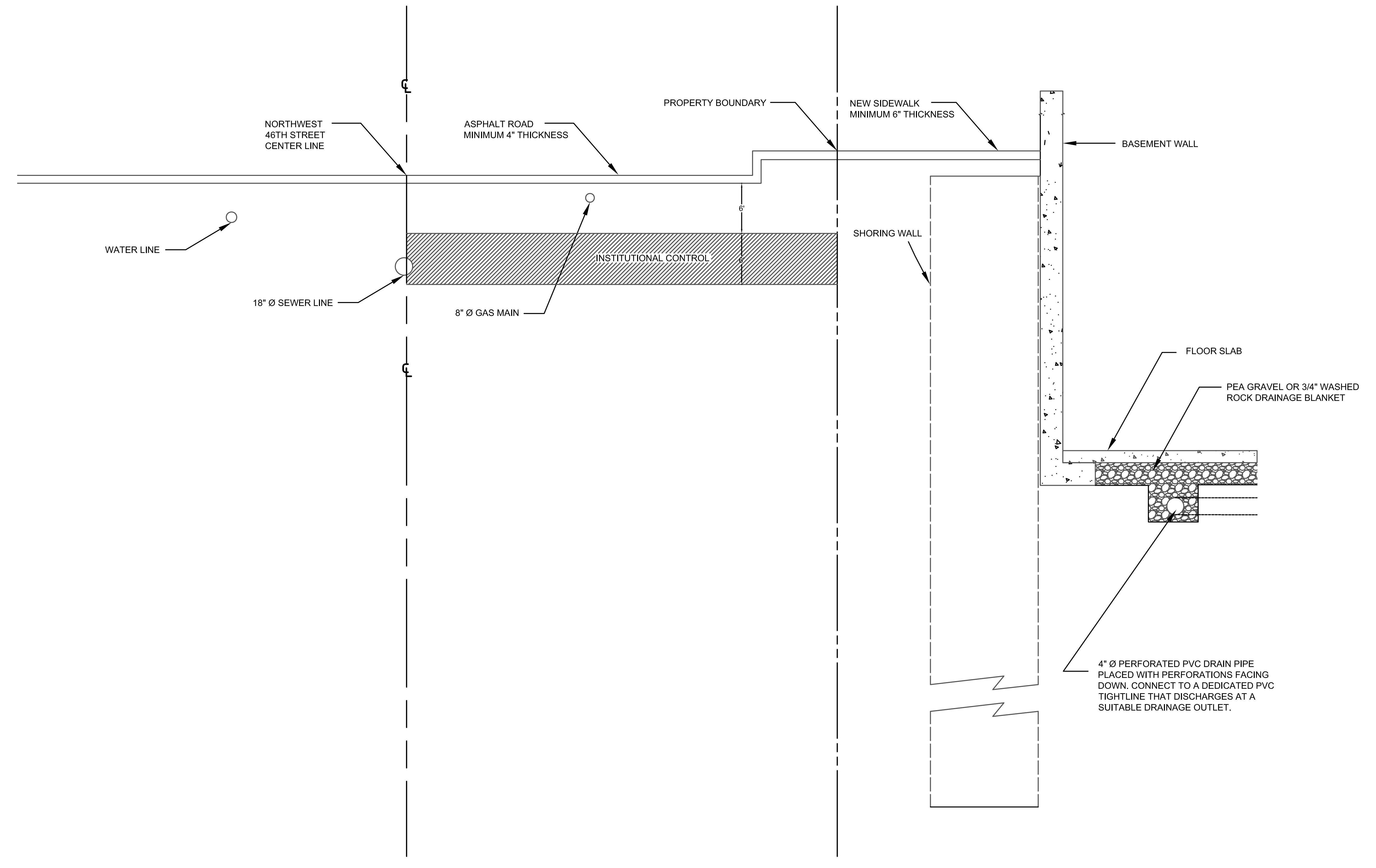


NOT TO SCALE

FIGURE 19
CONCEPTUAL ALTERNATIVE 1c

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG19 CONCEPTUAL SUB-SLAB DRAINAGE DETAIL_1C_F.DWG

SOUNDENVIRONMENTAL.COM

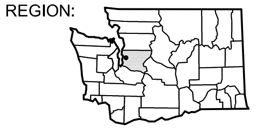


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: JQC/NAC
CHECKED BY: TWM
CAD FILE: 0398-002_FIG20 CSS_2c

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NW 46TH STREET
CITY: SEATTLE, WASHINGTON

REGION:



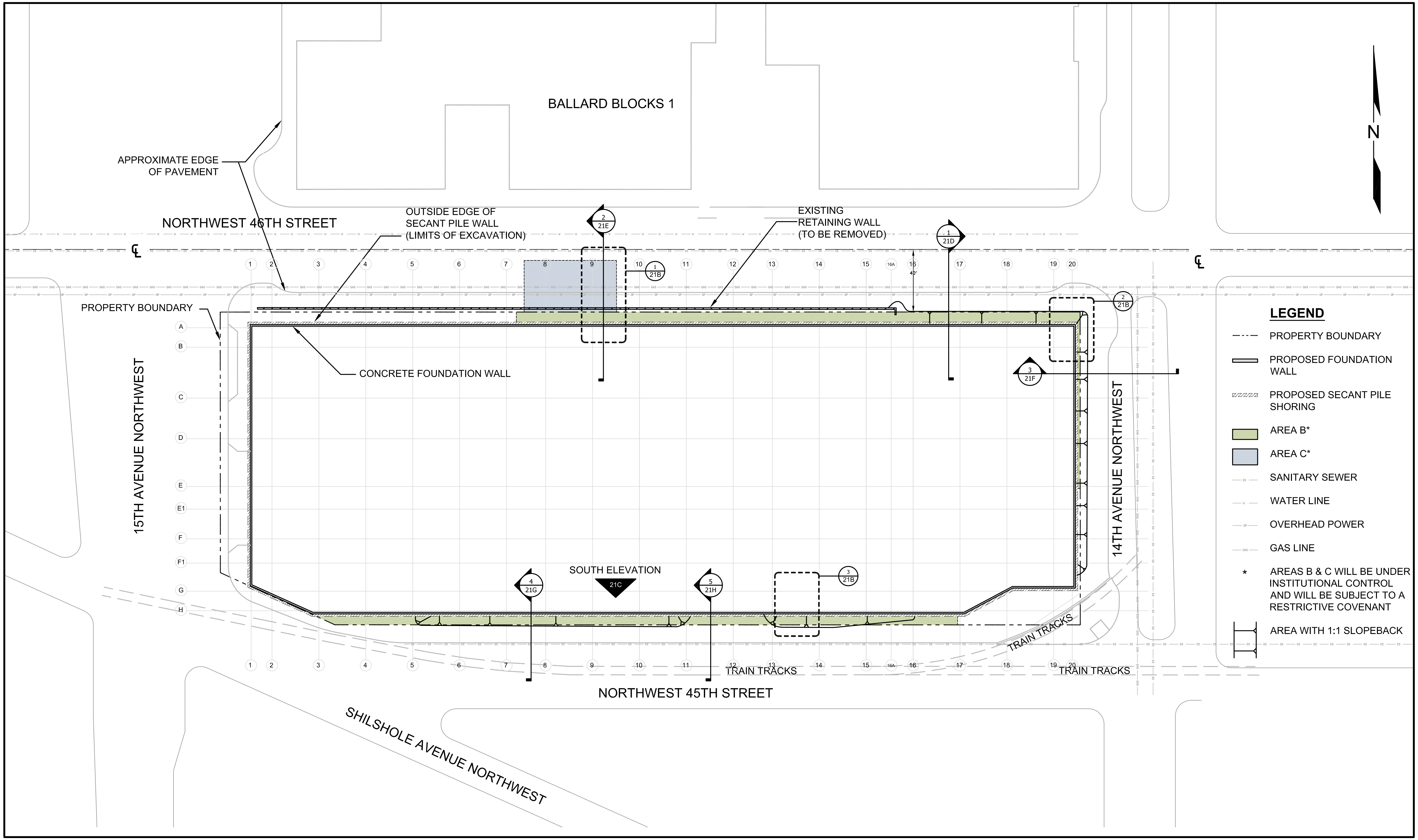
NOT TO SCALE

FIGURE 20
CONCEPTUAL ALTERNATIVE 2c

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS_CAP REPORT_JQC\0398-002_FIG20 CONCEPTUAL SUB-SLAB DRAINAGE DETAIL_2C_F.DWG

1/18/2010

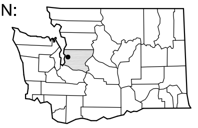
P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398_002_FIG21A_F.DWG

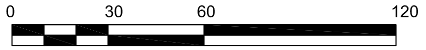


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002 FIG21A

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:


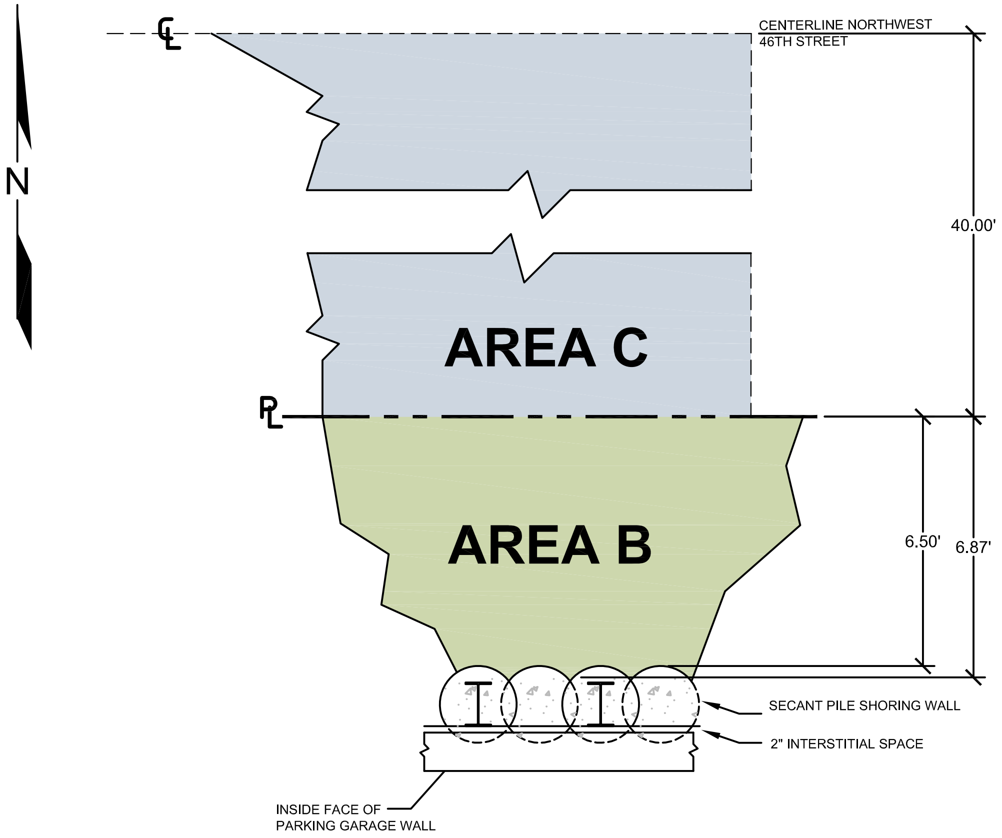


APPROXIMATE SCALE IN FEET

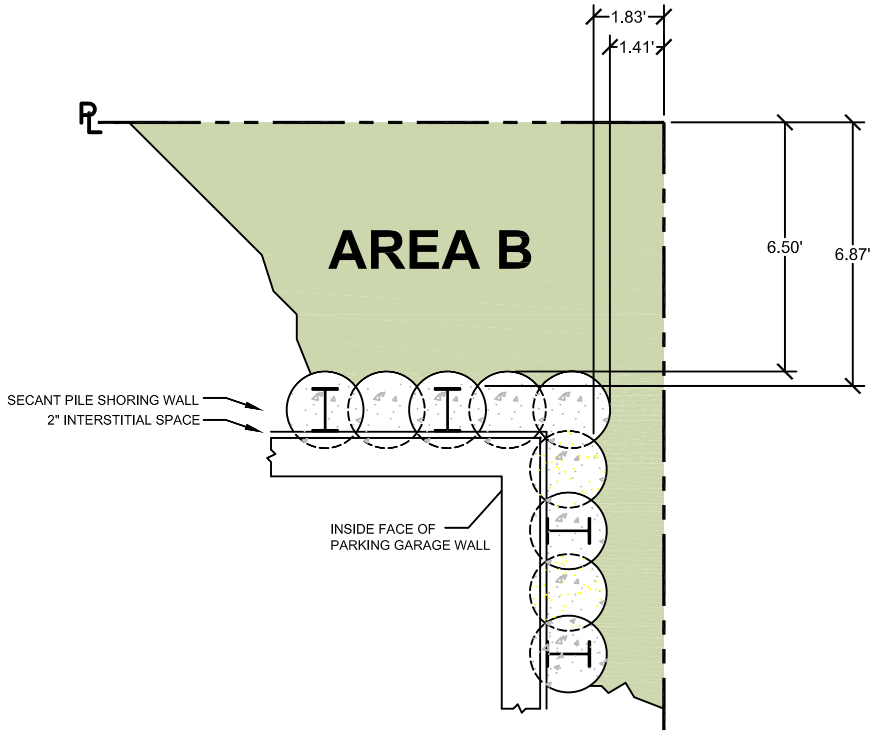
FIGURE 21A

INSTITUTIONAL CONTROL AREAS B & C

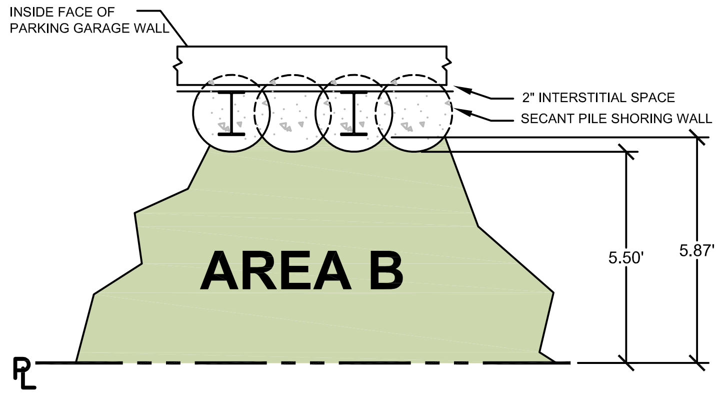
SOUNDENVIRONMENTAL.COM



① AREA B/C DETAIL: NORTHERN PROPERTY BOUNDARY



② AREA B DETAIL: NORTHEAST PROPERTY BOUNDARY



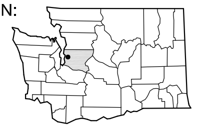
③ AREA B DETAIL: SOUTHERN PROPERTY BOUNDARY

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21B

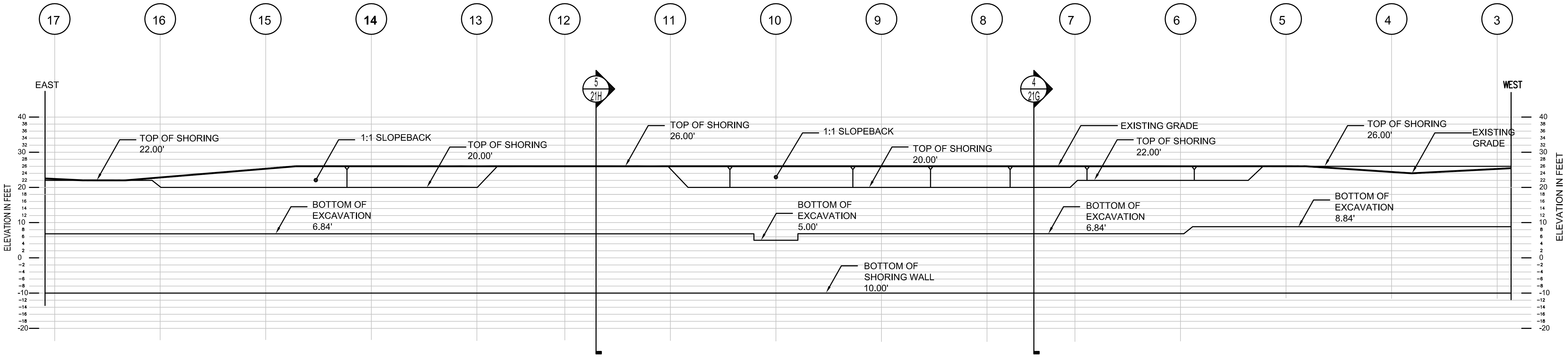
PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 5 10
APPROXIMATE SCALE IN FEET

FIGURE 21B
PLAN VIEW DETAILS OF SHORING WALL AND REMAINING CONTAMINATION CONDITIONS



SOUTH SHORING WALL

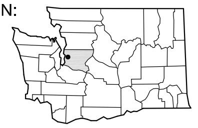
PARTIAL ELEVATION

SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21C

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:



0 15 30 60
APPROXIMATE SCALE IN FEET
VERTICAL AND HORIZONTAL

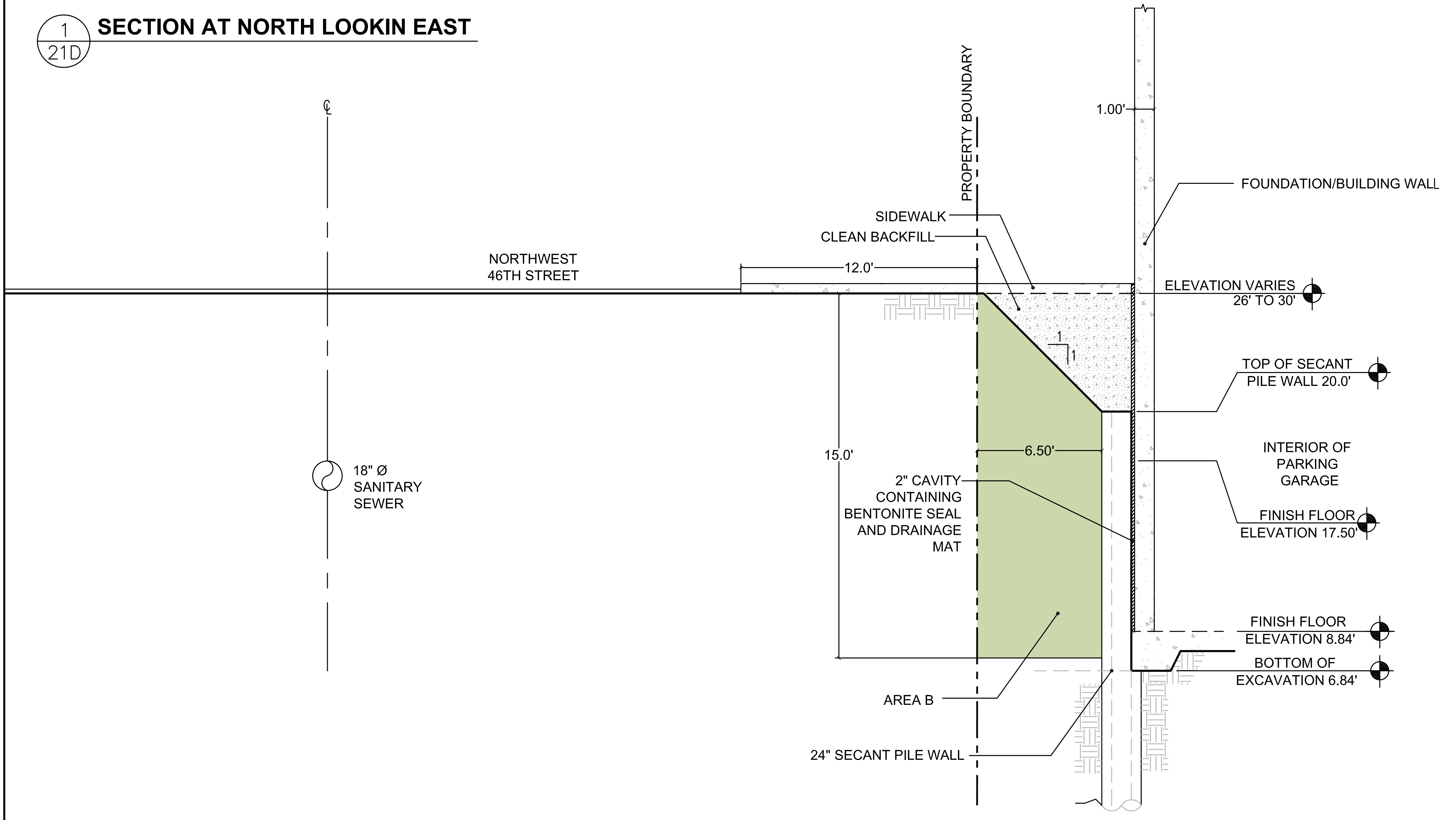
FIGURE 21C
PARTIAL ELEVATION
SOUTH SHORING WALL

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398 002 FIG21C F.DWG 1/15/2010

1/15/2010

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398 002 FIG21D F.DWG

1/21D SECTION AT NORTH LOOKIN EAST

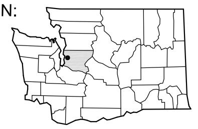


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21D

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:

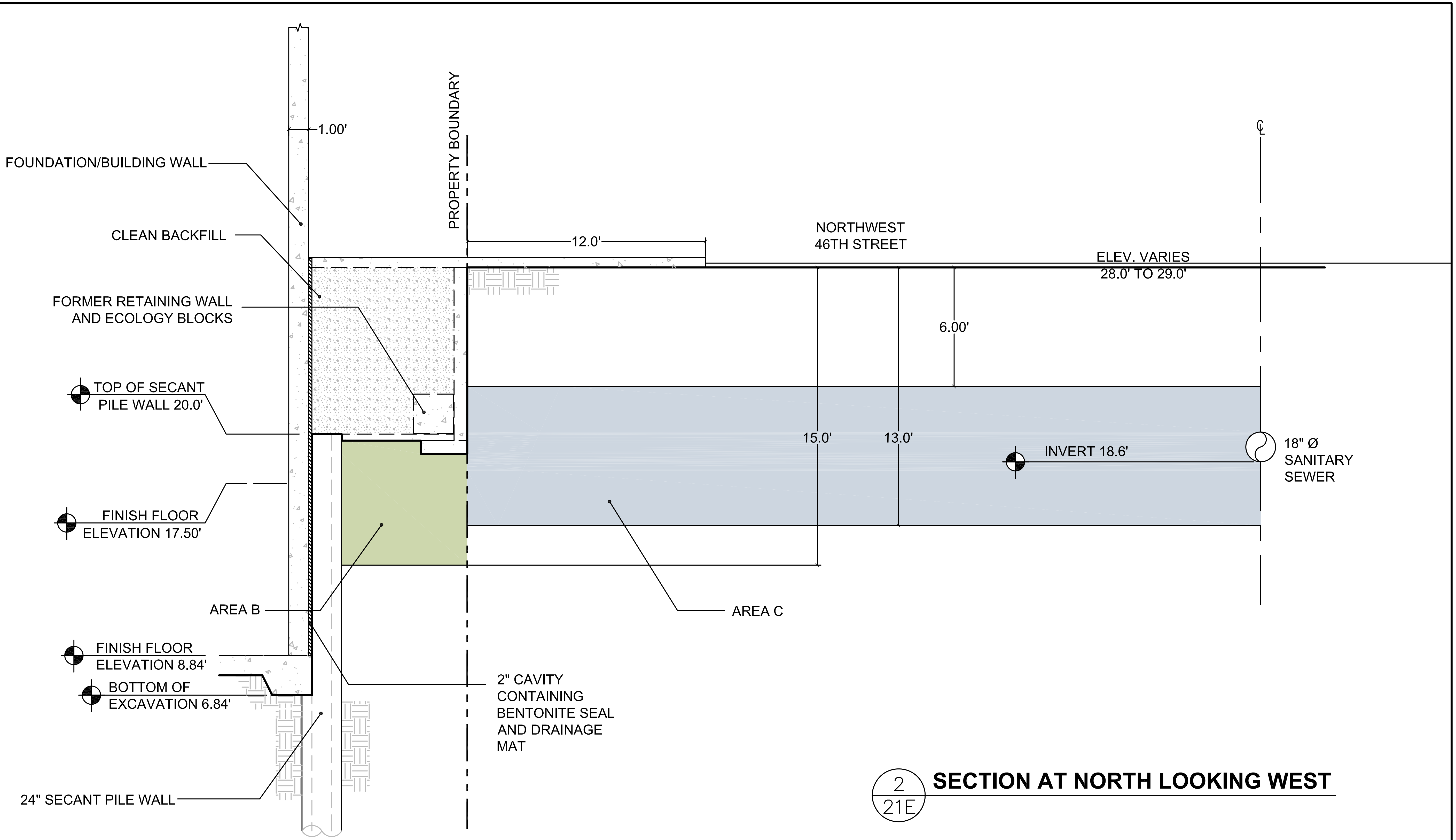


0 5 10
APPROXIMATE SCALE IN FEET

FIGURE 21D
CROSS-SECTIONAL DETAIL
NORTH SHORING WALL

SOUNDENVIRONMENTAL.COM

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398_002 FIG21E F.DWG 1/15/2010



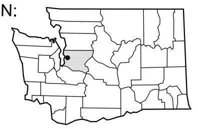
2
21E
SECTION AT NORTH LOOKING WEST

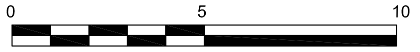
SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21E

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET

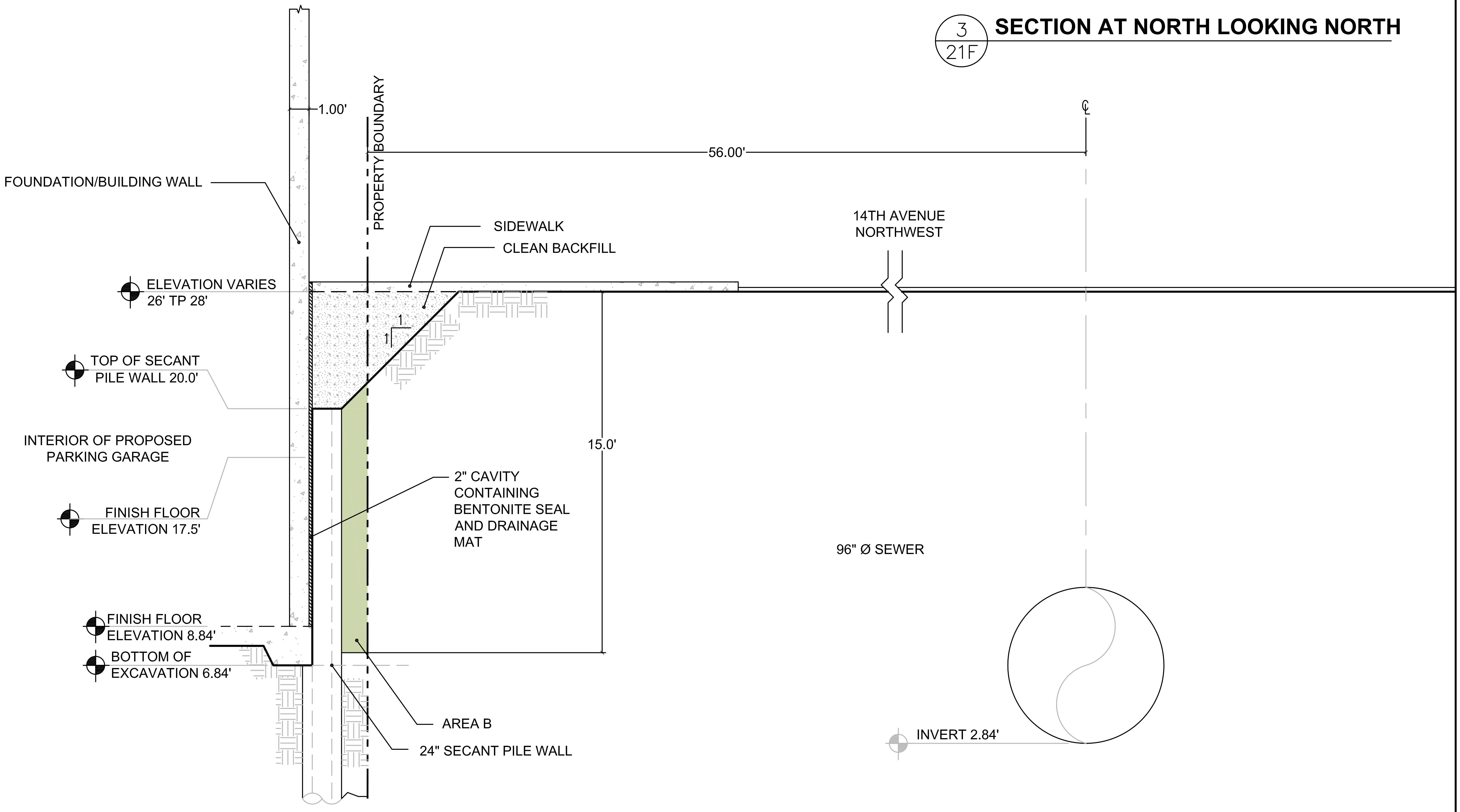
FIGURE 21E
CROSS-SECTIONAL DETAIL
NORTH SHORING WALL

SOUNDENVIRONMENTAL.COM

1/15/2010

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398 002 FIG21F F.DWG

SECTION AT NORTH LOOKING NORTH

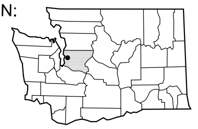


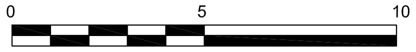
SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21F

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:





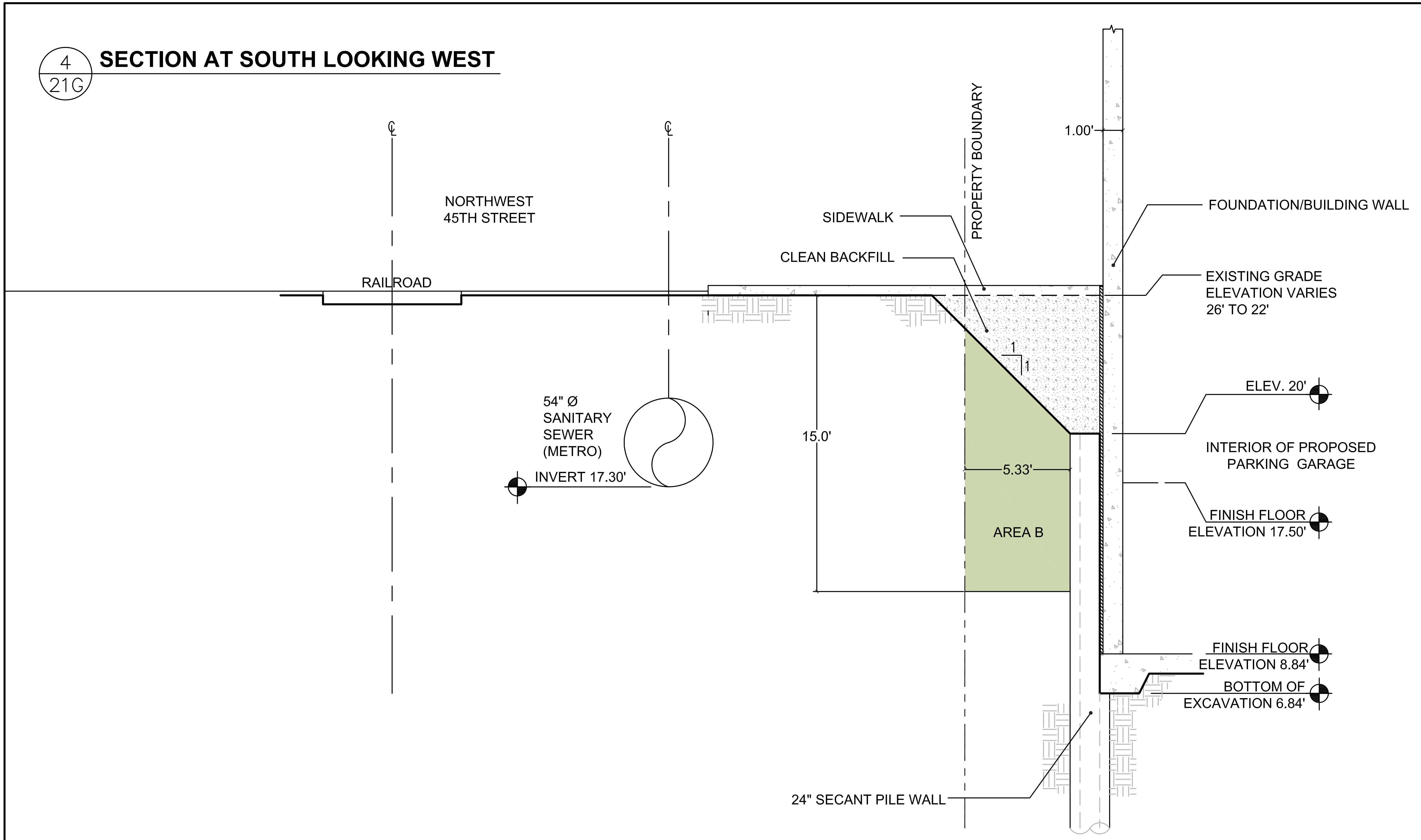
APPROXIMATE SCALE IN FEET

FIGURE 21F
CROSS-SECTIONAL DETAIL
EAST SHORING WALL

SOUNDENVIRONMENTAL.COM

P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\TECHNICAL\CAD\2008 RIFS CAP REPORT JQC\0398 002 FIG21G F.DWG 1/15/2010

4/21G SECTION AT SOUTH LOOKING WEST

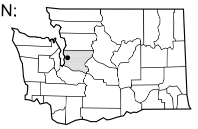


SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21G

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:

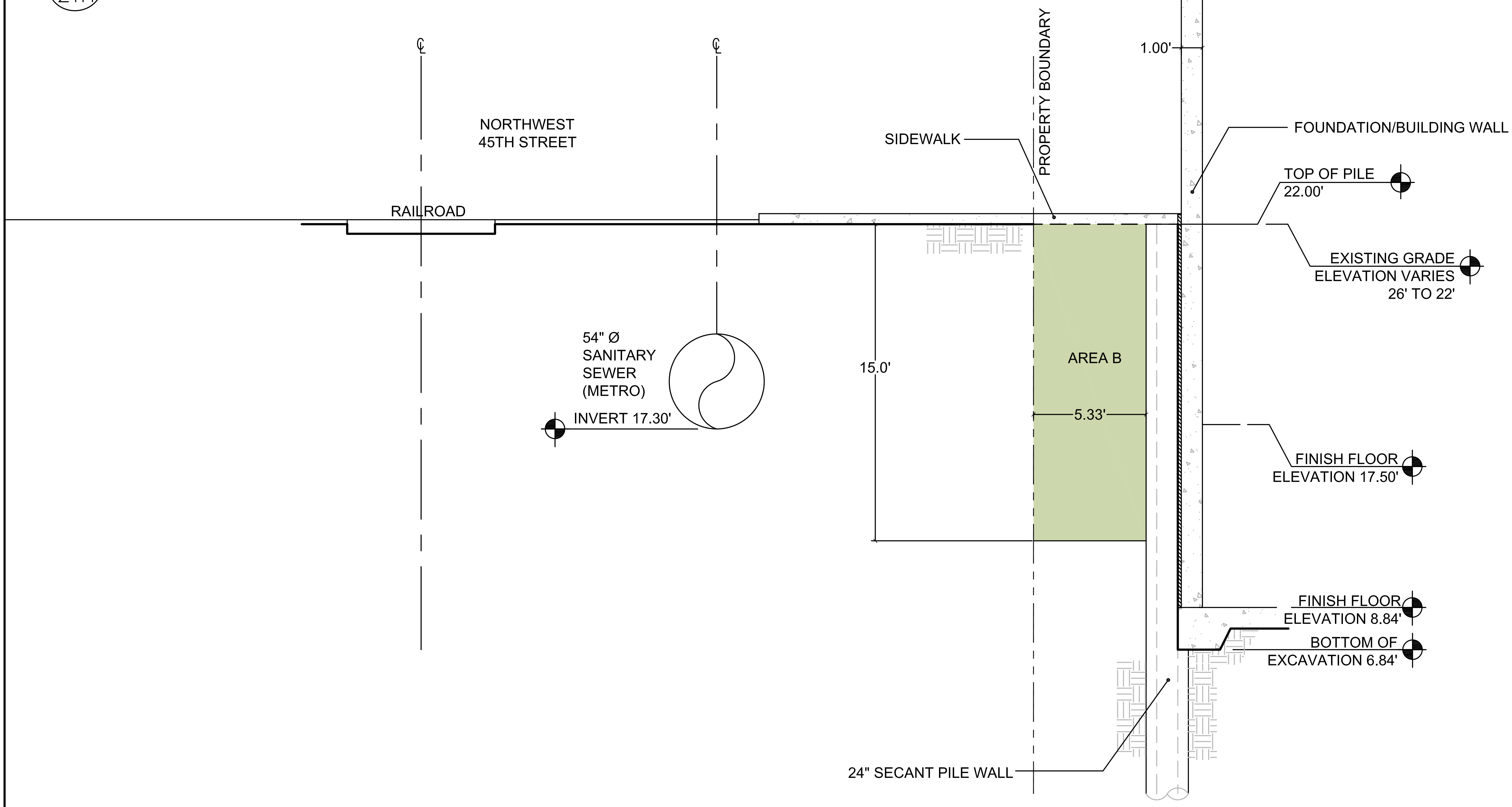


0 5 10
APPROXIMATE SCALE IN FEET

FIGURE 21G
CROSS-SECTIONAL DETAIL
SOUTH SHORING WALL

1/15/2010

5 21H SECTION AT SOUTH LOOKING WEST



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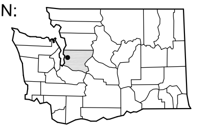
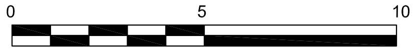
SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: VPB
CHECKED BY: CMC
CAD FILE: 0398-002_FIG21H

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY,STATE: SEATTLE, WASHINGTON

REGION:





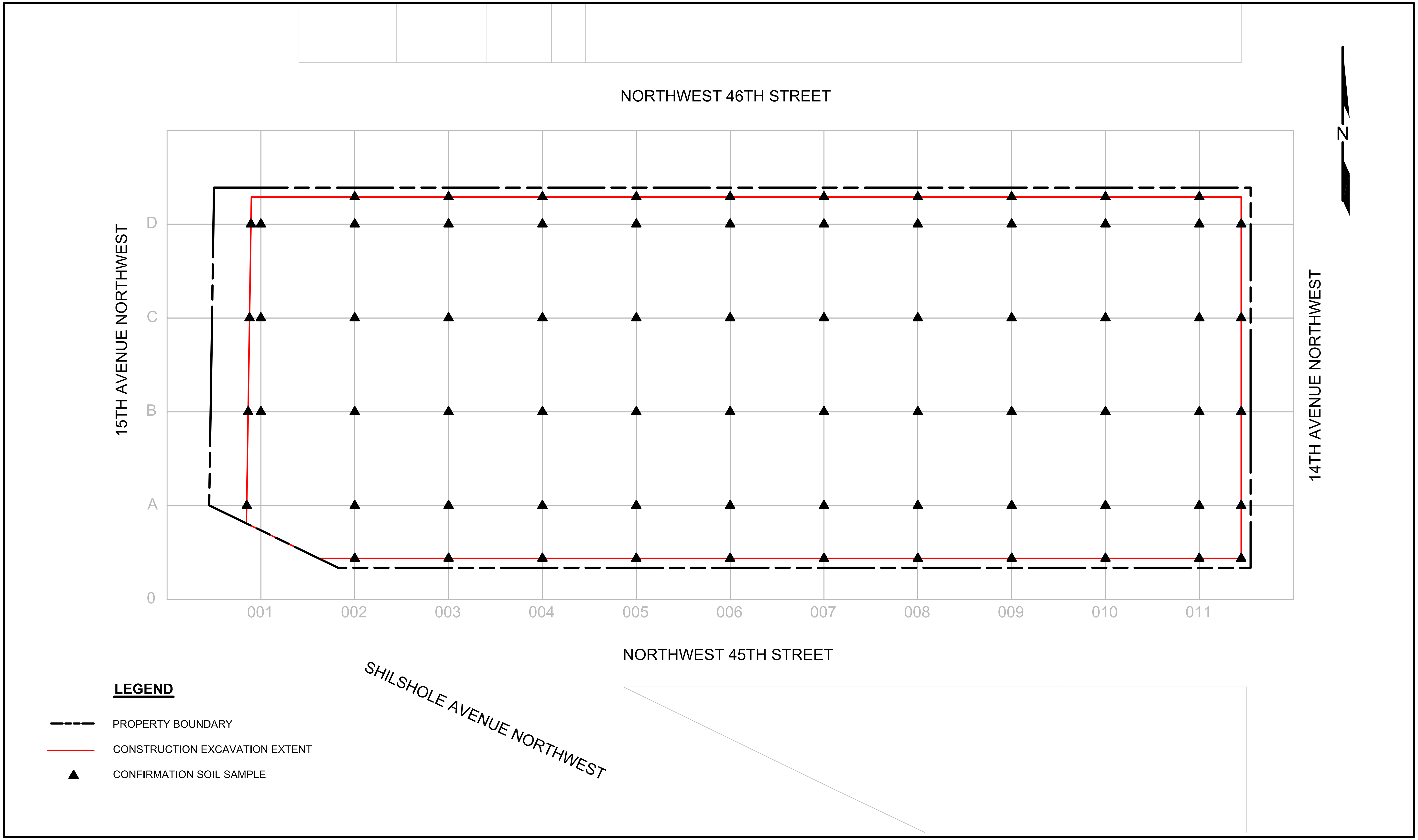
APPROXIMATE SCALE IN FEET

FIGURE 21H
CROSS-SECTIONAL DETAIL
SOUTH SHORING WALL

SOUNDENVIRONMENTAL.COM

1/15/2010

P:\0398 Ballard - Ramras\0398-002 Ballard Blocks 2 (Wesmar)\Technical\CAD\2008 RIFS_CAP Report_jqc\0398-002_FIG22 CONF_F.dwg

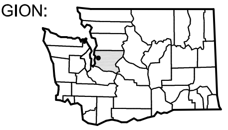


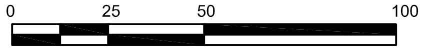
SOUND ENVIRONMENTAL STRATEGIES
SOUNDENVIRONMENTAL.COM

DATE: 01/15/10
DRAWN BY: NAC/JQC
CHECKED BY: EKR
CAD FILE: 0398-002_FIG22 ONF

PROJECT NAME: FORMER WESMAR PROPERTY
SES PROJECT NUMBER: 0398-002
STREET ADDRESS: 1401 & 1451 NORTHWEST 46TH STREET
CITY, STATE: SEATTLE, WASHINGTON

REGION:





APPROXIMATE SCALE IN FEET 1" = 50'

FIGURE 22
CONFIRMATION SOIL
SAMPLE LOCATIONS

SOUNDENVIRONMENTAL.COM

TABLES

Table 1
Regional Property Use History
Former Wesmar Property
1401 & 1451 Northwest 48th Street
Seattle, Washington

No.	Parcel ID	Address	Location Relative to SP	Owners	Use History	Source
1	046700-0335	4733 Shilshole Avenue Northwest	Southwest-West	Ballard Mill & Marina Seattle Cedar Manufacturing Co.	Cedar Shingle Mill	Archives
2	276770-2295	4602 Shilshole Avenue Northwest	West-Northwest	Chester Forsher 1946	Cabinet Shop Auto Repair	Archives
3	276770-2190	1545 Northwest Ballard Way	Northwest	Cynthia L. Greer 1939 Robert W. Coleman 1956 Seattle Cedar Lumber 1957	Tile Block Manufacturing	Archives
4	276770-2200/2205	1537 Northwest Ballard Way	Northwest	The Ballard Co.	Plumbing & Heating Company	Archives
5	276770-2215	1525 Northwest Ballard Way	Northwest	NA	Mattress Warehouse	Archives
6	276770-2290	1540 Northwest 46th Street	West-Northwest	Bolcom-Canal Labor Co. 1919	Machine Works - offices Seattle Cedar Lumber Mfg - offices?	Archives
7	276770-2270/2280	1526 Northwest 46th Street 1522 Northwest 46th Street	West-Northwest	Lars O. Brekke Brekke Company, Inc. 1957	Mill & Blacksmith Factory Welding Machine Shop Lumber Storage	Archives Sanborn Fire Insurance Maps
8	276770-2250 to 2260	4603 15th Avenue Northwest 4607 15th Avenue Northwest 1510 Northwest 46th Street 1516 Northwest 46th Street 1514 Northwest 46th Street	Northwest	Robert Wilson 1919 David Ohman 1957 City of Seattle 1957 Harris Electric Co. et al.	SFR SFR (2) SFR (3) Warehouse Machine Storage SFR (4)	Archives Sanborn Fire Insurance Maps
9	276840-0010/0015	NA	West	Lyle E. Branchflower 1943	Store Bulk Organic Oil Storage	Archives Sanborn Fire Insurance Maps
10	276770-2105	1515 Leary Way 1501 Leary Way	North-Northwest	James Pirkl 1930 Ballard Auto Wrecking Mary Chamberlain Louis Diamond 1936	Auto Wrecking Yard Used Car Sales Union Oil Service Station Welding, Gas Tanks	Archives
11	276830-2600 to 2692	1437 to 1443 Northwest Leary Way 1427 Northwest Leary Way 1427 Northwest 48th Street	North	Seattle Electric Co. 1907 W.P. Fuller Co. 1949 DeShaw Auto Rebuild M.L. Stewart	Power Station Paint Manufacturing Auto Repair SFR	Archives
12	276830-3140 to 3180	1415 Northwest Ballard Way	North	Olympian Stone Co. General Disposal Co.	Concrete Casting Factory Paint Shop American Laundry	Archives Sanborn Fire Insurance Maps
13	276830-3200	1415 to 1441 Northwest Ballard Way	North	Olympian Stone Co.	Storage, Drying Shed	Archives
14	276830-3190	4609 14th Avenue Northwest	North	Northwest Wool Co.	Factory West Coast Iron Works	Archives Sanborn Fire Insurance Maps

Table 1
Regional Property Use History
Former Wesmar Property
1401 & 1451 Northwest 48th Street
Seattle, Washington

No.	Parcel ID	Address	Location Relative to SP	Owners	Use History	Source
15	276830-2590	1451 Northwest Leary Way	North	Sam Oshman 1930	Auto Wrecking Yard Joe's Iron & Metal	Archives
16	276830-2800	1144 Northwest Ballard Way	North-Northeast	Magnolia Milling Co.	Mill Warehouse/Office Magnolia Fertilizer	Archives
17	276830-2780	1120 Northwest Ballard Way	East-Northeast	Coast Wood Products Co.	Commercial Wood Turning	Archives
18	276830-2790	NA	Northeast	Burlington Northern Santa Fe	Railroad	Archives
19	276830-3040	1121 Northwest Ballard Way 1111 Northwest Ballard Way	East-Northeast East-Northeast	Pacific Chair Co. Arrowline Inc.	Furniture Factory w Dry Kiln Factory	Archives Archives
20	276830-3035	NA	Northeast	Burlington Northern Santa Fe	Railroad	Archives
21	276830-3105	1138 Northwest 46th Street	Northeast	North Coast Tanning Co. Inc.	Factory	Archives
22	276830-3100	NA	Northeast	Burlington Northern Santa Fe	Railroad	Archives
23	276830-3080	1110 to 1128 Northwest 46th Street	East-Northeast	Seattle Boiler Works	NA	Archives
24	276830-3430	1115 Northwest 46th Street 1117 Northwest 46th Street	East	Gilmore Oil Co. 1932 Jacobs Co.	Loading Pumps Garage	Archives
		1119 Northwest 46th Street		Guernsey-Ostergard, Inc.	13 Bulk Fuel Tanks Paint Shop Heating Plant Repair Garage	
25	276830-3415	1132 Northwest 45th Street	East	Seattle Boiler Works 1950	Shop and Office	Archives
26	276830-3435	NA	East	Burlington Northern Santa Fe	Railroad	Archives
27	276830-3385	4502 - 4518 14th Avenue Northwest	East	W.R. Yeakel 1937 Northwest Nut & Bolt Co. King Paper Co. Ballard Drop Forge Co. Jacobs Co.	Bolt & Nut Factory Anchor Fences	Archives Sanborn Fire Insurance Maps
28	276830-3390	4502 - 4518 14th Avenue Northwest	East	W.R. Yeakel 1937 Northwest Nut & Bolt Co. King Paper Co. Ballard Drop Forge Co. Jacobs Co.	Bolt & Nut Factory Anchor Fences	Archives Sanborn Fire Insurance Maps
29	276830-3240/3245	4606 15th Avenue Northwest 4517 14th Avenue Northwest 1401 Northwest 46th Street 4517 14th Avenue Northwest Northwest 45th/46th Street & 14th Avenue northwest	SP	W.C. Sloan 1935 Durabilt Luggage Co. Pacific Plastics Co. City of Seattle Electric Light & Water Works Continental Pipe Manufacturing Co. Pacific Coast Pipe Co.	SFR Factory (pipe manufacturing/storage) Factory Cannery Factory (part of Ballard Lumber Co.) Concrete Mill	Archives Sanborn Fire Insurance Maps

Table 1
Regional Property Use History
Former Wesmar Property
1401 & 1451 Northwest 48th Street
Seattle, Washington

No.	Parcel ID	Address	Location Relative to SP	Owners	Use History	Source
30	276830-3765	4401 to 4415 11th Avenue Northwest	East-Southeast	General Petroleum Corp. of California 1929	5 Bulk Fuel Tanks & Loading Rack	Archives
31	046700-0120	4315 11th Avenue Northwest	Southeast	General Petroleum Co. (1929)		Archives
32	046700-0075	1119 Northwest 45th Street	Southeast	Commercial Marine Construction Ballard Manufacturing Co. Shingle Mill J.W. McDonnel Lumber & Shingle Mill Pacific Fishing & Trading Co. Pacific Marine Supply Co. Pioneer Sand & Gravel Co.	Lumber & Shingle Mill	Archives Sanborn Fire Insurance Maps
33	276840-0025	1403 Northwest 45th Street	South	Pacific Fishing & Trading Co. Sound Construction Co. Ballard Lumber Co.	Office Lumber Mill	Archives Sanborn Fire Insurance Maps
34	046700-0145	4421 Shilshole Avenue Northwest	South-Southeast	DNR Pacific Fishing & Trading Co. State of Washington	Research Lab Welding	Archives Sanborn Fire Insurance Maps
35	046700-0155	4455 Shilshole Avenue Northwest	South	Phoenix Shingle Co. Phoenix Lumber Co.	Lumber & Shingle Mill	Sanborn Fire Insurance Maps
36	046700-0385	4507 Shilshole Avenue Northwest	West-Southwest	Wayland Mill Co. Lyle E. Branchflower	Lumber & Shingle Mill Fat Extraction Plant	Archives Sanborn Fire Insurance Maps

NOTES:
Archives = Puget Sound Regional Archives
DNR = Department of Natural Resources
NA = information not available
SFR = single-family residence
SP = subject property

Table 2
Historical Groundwater Analytical Results
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Well ID	Sample Date	Depth to Groundwater[1] (feet)	Groundwater Elevation[2] (feet)	DRPH[3]	ORPH[3]	GRPH[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]	Arsenic[6]		Lead[6]		Benzo(a)pyrene[5]	Naphthalene[5]
											Total	Dissolved	Total	Dissolved		
Seep	06/13/07	--	--	--	--	--	--	--	--	--	1.41	1.59	--	--	--	<0.1
Tap Water	06/13/07	--	--	--	--	--	--	--	--	--	<1	<1	--	--	--	<0.1
MW01 (BB1)	06/20/07	9.71	--	--	--	--	--	--	--	--	**130**	--	--	--	--	--
	12/14/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW02 (BB1)	11/27/06	7.86	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TOC Elevation: 28.76	06/13/07	9.37	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/20/07	10.64	--	520	<250	<100	<1	<1	<1	<3	**17.9**	4.4	--	--	--	--
	12/14/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW03 (BB1)	11/27/06	7.84	20.35	--	--	--	--	--	--	--	--	--	--	--	--	--
TOC Elevation: 28.19	06/13/07	9.59	18.60	--	--	--	--	--	--	--	--	--	--	--	--	--
	06/20/07	11.40	16.79	68	<250	<100	<1	<1	<1	<3	<1	<1	--	--	--	--
	12/14/07	9.10	19.09	--	--	--	--	--	--	--	--	--	--	--	--	--
MW04 (BB1)	11/27/06	7.46	19.99	<50	<250	<100	<1	<1	<1	<3	--	--	--	--	--	--
TOC Elevation: 27.45	06/13/07	8.54	18.91	--	--	--	--	--	--	--	**8.51**	**9.2**	--	--	--	--
	12/14/07	7.92	19.53	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-01	09/20/06	8.32	18.35	<50	<250	<100	<1	<1	<1	<3	**15**	**14.3**	--	--	<0.1	<0.1
TOC Elevation: 26.67	10/10/06	7.44	19.23	--	--	--	--	--	--	--	**16.8**	**16.8**	--	--	--	--
	11/27/06	7.64	19.03	--	--	--	--	--	--	--	**18.2**	**18.8**	--	--	--	--
	06/13/07	7.10	19.57	--	--	--	--	--	--	--	**19.2**	**20.4**	--	--	<0.1	<0.1
	12/06/07	7.80	18.87	--	--	--	--	--	--	--	**16.7**	**16.5**	--	--	--	--
MW-02	09/20/06	8.89	18.67	<50	<250	<100	<1	<1	<1	<3	2.95	2.94	--	--	<0.1	<0.1
TOC Elevation: 27.56	10/10/06	8.72	18.84	--	--	--	--	--	--	--	2.8	3.55	--	--	--	--
	11/27/06	7.92	19.64	--	--	--	--	--	--	--	1.76	1.67	--	--	--	--
	06/13/07	8.25	19.31	--	--	--	--	--	--	--	4.36	3.31	--	--	<0.1	<0.1
	12/06/07	8.47	19.09	--	--	--	--	--	--	--	1.35	1.03	--	--	--	--
MW-03	09/20/06	2.18	17.50	<50	<250	<100	<1	<1	<1	<3	**759**	**727**	--	--	<0.1	<0.1
TOC Elevation: 19.68	10/10/06	2.11	17.57	--	--	--	--	--	--	--	**737**	**920**	--	--	--	--
	11/27/06	2.00	17.68	--	--	--	--	--	--	--	**759**	**837**	--	--	--	--
	06/13/07	2.03	17.65	--	--	--	--	--	--	--	**267**	**538**	--	--	<0.1	<0.1
	12/06/07	2.20	17.48	--	--	--	--	--	--	--	**502**	**456**	--	--	--	--
MW-04	09/20/06	3.82	18.52	<50	<250	<100	<1	<1	<1	<3	**176**	**158**	--	--	<0.1	<0.1
TOC Elevation: 22.34	10/10/06	3.76	18.58	--	--	--	--	--	--	--	**269**	**269**	--	--	--	--
	11/28/06	3.22	19.12	--	--	--	--	--	--	--	**214**	**225**	--	--	--	--
	06/13/07	3.35	18.99	<50	<250	<100	<1	<1	<1	<3	**247**	**277**	--	--	<0.1	<0.1
	12/07/07	3.60	18.74	--	--	--	--	--	--	--	**151**	**145**	--	--	--	--
MW-05	09/20/06	7.20	18.31	59[x]	<250	<100	<1	<1	<1	<3	**27.2**	**27.3**	--	--	<0.1	2.5
TOC Elevation: 25.51	10/10/06	7.15	18.36	--	--	--	--	--	--	--	**70.9**	**87.9**	--	--	--	--
	11/27/06	6.59	18.92	--	--	--	--	--	--	--	**31.3**	**33.1**	--	--	--	--
	06/13/07	6.30	19.21	--	--	--	--	--	--	--	**17.8**	**22.7**	--	--	<0.1	<0.1
	12/06/07	6.85	18.66	--	--	--	--	--	--	--	**130**	**113**	--	--	--	--
MW-06	09/20/06	2.32	18.58	<50	<250	<100	<1	<1	<1	<3	**6.02**	**5.94**	--	--	<0.1	<0.1
TOC Elevation: 20.90	10/10/06	2.14	18.76	--	--	--	--	--	--	--	4.45	4.45	--	--	--	--
	11/28/06	1.79	19.11	--	--	--	--	--	--	--	4.27	3.69	--	--	--	--
	06/13/07	1.86	19.04	<50	<250	--	<1	<1	<1	<3	4.08	4.09	--	--	<0.1	<0.1
	12/06/07	2.78	18.12	--	--	--	--	--	--	--	4.10	3.96	--	--	--	--

Table 2
Historical Groundwater Analytical Results
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Well ID	Sample Date	Depth to Groundwater[1] (feet)	Groundwater Elevation[2] (feet)	DRPH[3]	ORPH[3]	GRPH[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]	Arsenic[6]		Lead[6]		Benzo(a)pyrene[5]	Naphthalene[5]
											Total	Dissolved	Total	Dissolved		
MW-07	09/20/06	7.68	18.82	<50	<250	<100	<1	<1	<1	<3	**1,090**	**878**	--	--	<0.1	<0.1
TOC Elevation: 26.50	10/10/06	7.58	18.92	--	--	--	--	--	--	--	**1,170**	**1,230**	--	--	--	--
	11/27/06	7.34	19.16	--	--	--	--	--	--	--	**1,090**	**1,130**	--	--	--	--
	06/13/07	7.00	19.50	--	--	--	--	--	--	--	**1,150**	**1,120**	--	--	<0.1	<0.1
	12/06/07	7.43	19.07	--	--	--	--	--	--	--	**613**	**596**	--	--	--	--
MW-08	09/20/06	1.12	18.69	**4,300**[x]	<250	310	**24**	25	2.6	27	**13.7**	**15.6**	--	--	<2[5]	**450**
TOC Elevation: 19.81	10/10/06	1.25	18.56	--	--	--	--	--	--	--	--	--	--	--	--	--
	11/27/06	1.13	18.68	--	--	--	--	--	--	--	**7.47**	**7.18**	--	--	--	--
	06/13/07	0.45	19.36	50[x]	<250	--	2.7	2.3	<1	4.7	**9.97**	**9.04**	--	--	<0.1	**170**
	12/06/07	1.19	18.62	--	--	--	<1	<1	<1	<3	**6.35**	**6.12**	--	--	--	--
MW-09	11/27/06	-1.0	--	--	--	--	--	--	--	--	<1	<1	--	--	--	--
TOC Elevation: 25.61	06/13/07	-1.0	--	--	--	--	--	--	--	--	1.11	<1	--	--	<0.1	<0.1
	12/07/07	-1.21	--	--	--	--	--	--	--	--	<1	<1	--	--	--	--
MW-10	11/28/06	6.79	19.71	--	--	--	--	--	--	--	1.26	1.08	--	--	--	--
TOC Elevation: 26.50	06/13/07	7.23	19.27	--	--	--	--	--	--	--	1.33	1.20	--	--	<0.1	<0.1
	12/06/07	7.29	19.21	--	--	--	--	--	--	--	<1	<1	--	--	--	--
MW-11	11/28/06	7.35	19.20	--	--	--	--	--	--	--	**37.1**	**36**	--	--	--	--
TOC Elevation: 26.55	06/13/07	7.33	19.22	--	--	--	--	--	--	--	**44.7**	**43.4**	--	--	<0.1	<0.1
	12/06/07	7.55	19.00	--	--	--	<1	<1	<1	<3	**33.7**	**35.6**	--	--	--	--
MW-12 TOC Elevation: 27.54	12/07/07	8.23	19.31	73	<250	--	--	--	--	--	2.34	1.97	<1	<1	<0.1	<0.1
MW-13 TOC Elevation: 19.75	12/07/07	1.63	18.12	<50	<250	--	<1	<1	<1	<3	**25.1**	**25.7**	<1	<1	<0.1	<0.1
MTCA Method A Cleanup Levels for Groundwater[7]				500	500	1,000/800[a]	5	1,000	700	1,000	5		15		0.1	160
MW-14 TOC Elevation: 28.00	12/07/07	8.30	19.70	<50	<250	--	<1	<1	<1	<3	1.64	1.46	1.60	<1	<0.1	<0.1
MW-15 TOC Elevation: 28.65	12/07/07	8.80	19.85	<50	<250	--	<1	<1	<1	<3	**7.36**	**7.42**	<1	<1	<0.1	<0.1
MW-16 TOC Elevation: 25.86	12/07/07	8.28	17.58	240	<250	--	<1	<1	<1	<3	**6.91**	**6.64**	2.90	<1	<0.1	<0.1
MW-17 TOC Elevation: 26.89	12/07/07	9.45	17.44	**530**	310[y]	--	--	--	--	--	1.60	1.51	<1	<1	<0.1	<0.1
MTCA Method A Cleanup Levels for Groundwater[7]				500	500	1,000/800[a]	5	1,000	700	1,000	5		15		0.1	160

NOTES:

Results measured in µg/L.

RED indicates concentration exceeds applicable cleanup level.

All samples analyzed by Friedman & Bruya, Inc. of Seattle, Washington

[1] Depth to water as measured from a fixed spot on the well casing rim.

[2] Elevations measured relative to an arbitrary benchmark with an assumed elevation of 100.00 feet.

[3] Analyzed by Northwest Method NWTPH-Dx.

[4] Analyzed by Northwest Method NWTPH-Gx.

[5] Analyzed by EPA Method 8260B or 8270C SIM.

[6] Samples analyzed by EPA Method 200.8.

[7] MTCA Method A Cleanup Levels for Groundwater, Table 720-1 of the WAC 173-340.

[a] Cleanup level is 1000 mg/L when benzene is not present and 800 mg/L when benzene is present.

[x] The pattern of peaks present is not indicative of diesel.

[y] The pattern of peaks present is not indicative of motor oil.

-- = not measured / not analyzed

< = not detected at concentration exceeding the laboratory reporting limit

µg/L = micrograms per liter

EPA = United States Environmental Protection Agency

NA = not applicable

MTCA = Model Toxics Control Act

TOC = top of casing

WAC = Washington Administrative Code

Table 3
Summary of Soil Analytical Results for Polycyclic Aromatic Compounds
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (Feet)	Analytical Results [1]																
			Naphthalene	Acenapthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene	Pentachlorophenol
B-01-5.5	09/28/05	5.5	0.83	<0.3	--	0.45	5.0	1.4	11.0	13.0	5.3	5.9	**6.4**	6.1	2.2	2.0	0.61	2.0	--
B-02-9	09/28/05	9	<1.5	<1.5	--	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<3	<1.5	<1.5	<1.5	--
B-03-4.0	09/28/05	4	<0.03	<0.03	--	<0.03	0.038	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.06	<0.03	<0.03	<0.03	--
B-04-5.5	09/28/05	5.5	2.6	1.4	--	0.14	1.0	0.22	1.2	1.2	0.51	0.61	**0.64**	0.73	0.26	0.20	0.048	0.19	--
B-05-4.5	09/28/05	4.5	<0.3	<0.3	--	0.45	4.1	0.94	4.0	4.6	1.7	1.9	**1.8**	1.6	<0.6	0.62	<0.3	0.66	--
B-06-15	09/06/06	15	<.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<.005	<0.070
B-06-19	09/06/06	19	<.005	<0.005	<0.005	<0.005	<.005	<0.005	<0.005	<.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<.005	<0.070
B-06-23	09/06/06	23	<.005	<0.005	<0.005	<0.005	<.005	<0.005	0.005	<.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<.005	<0.070
B-06-29	09/06/06	29	<.005	<0.005	<0.005	<0.005	<.005	<0.005	<0.005	<.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<.005	<0.070
B-07-10.5	09/07/06	10.5	0.0061	<0.005	0.015	<0.005	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-07-12.5	09/07/06	12.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-07-29	09/07/06	29	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-08-4.0	09/07/06	4	1	1.5	1.6	4.1	48	11	64	72	32	33	**35**	29	11	--	4.5	23	<6
B-08-11.5	09/07/06	11.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-08-19.5	09/07/06	19.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-09-7.5	09/07/06	7.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.7
B-09-9.5	09/07/06	9.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-10-5.75	09/07/06	5.75	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-10-15	09/07/06	15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-11-10.5	09/08/06	10.5	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-11-13.5	09/08/06	13.5	0.014	<0.005	<0.005	<0.005	0.03	0.005	0.019	0.017	0.006	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-11-20	09/08/06	20	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-12-2.5	09/08/06	2.5	0.15	0.1	<0.03	<0.03	0.22	0.06	0.37	0.44	0.24	0.26	**0.37**	0.32	0.14	0.25	0.06	0.28	<0.3
B-12-4.0	09/08/06	4	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-12-16	09/08/06	16	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-13-4.5	09/11/06	4.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-13-9.5	09/11/06	9.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-14-4.0	09/11/06	4	<0.005	0.0058	<0.005	<0.005	0.0076	<0.005	0.06	0.08	0.1	0.13	**0.2**	0.22	0.09	0.19	0.05	0.21	<0.070
B-14-6.0	09/11/06	6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-14-9.0	09/11/06	9	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-15-4.5	09/11/06	4.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-15-8.5	09/11/06	8.5	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.3
B-16-4.5	09/11/06	4.5	**190**	64	71	110	450	130	300	290	120	120	**120**	100	41	65	17	71	<15
MTCA Method A Soil Cleanup			5.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.1	NE	NE	NE	NE	NE	NE

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Table 3
Summary of Soil Analytical Results for Polycyclic Aromatic Compounds
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (Feet)	Analytical Results [1]																
			Naphthalene	Acenapthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene	Pentachlorophenol
B-16-7.0	09/11/06	7	0.0074	<0.005	<0.005	0.0057	0.05	0.0073	0.04	0.04	0.009	0.0093	0.0089	0.0087	<0.005	<0.005	<0.005	0.0058	<0.070
B-16-9.0	09/11/06	9	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-16-11.5	09/11/06	11.5	0.033	<0.005	0.0098	0.017	0.12	0.019	0.09	0.09	0.03	0.03	0.03	0.021	0.0084	0.012	<0.005	0.013	<0.070
B-17-7.0	09/12/06	7	<0.005	<0.005	<0.03	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.03	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-17-13.5	09/12/06	13.5	0.019	<0.005	<0.03	<0.03	0.21	0.055	0.23	0.24	0.051	0.12	0.06	0.12	0.032	0.052	0.016	0.064	<0.070
B-17-25	09/12/06	25	<0.005	<0.005	<0.03	<0.03	<0.005	<0.005	<0.005	<0.005	<0.03	<0.005	<0.03	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-18-3.0	09/12/06	3	0.074	0.012	0.077	0.074	0.074	0.014	0.041	0.045	0.03	0.034	0.034	0.053	0.018	0.032	0.0086	0.039	<0.070
B-18-7.0	09/12/06	7	0.12	<0.005	0.02	0.029	0.11	0.024	0.072	0.071	0.03	0.031	0.027	0.025	0.011	0.011	<0.005	0.012	<0.070
B-18-9.0	09/12/06	9	0.0056	<0.005	<0.03	<0.03	0.0074	<0.005	<0.005	<0.005	<0.03	<0.005	<0.03	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-18-12.5	09/12/06	12.5	<0.005	<0.005	<0.005	<0.005	0.0063	<0.005	0.0055	0.0057	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-18-19.5	09/12/06	19.5	0.0076	<0.005	<0.005	<0.005	0.01	<0.005	0.0091	0.0093	0.0051	<0.005	0.0055	0.0053	<0.005	<0.005	<0.005	<0.005	<0.070
B-19-6.0	09/12/06	6	**27**	3.4	<0.5	7.1	27	6.3	15	14	5.4	5.6	**4.9**	4	<0.5	<0.5	<0.5	<0.005	<0.7
B-19-8.0	09/12/06	8	0.014	<0.005	<0.005	0.0085	0.037	0.0088	0.025	0.025	0.01	0.011	0.0094	0.0092	<0.005	<0.005	<0.005	<0.005	<0.070
B-19-11.5	09/12/06	11.5	0.06	0.0061	0.0061	0.026	0.13	0.027	0.08	0.08	0.03	0.04	<0.03	0.03	0.0085	0.013	<0.005	0.015	<0.070
B-19-14	09/12/06	14	0.0095	<0.005	<0.005	<0.005	0.0073	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-19-15	09/12/06	15	0.0051	<0.005	<0.005	<0.005	0.0065	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-20-5.0	09/12/06	5	0.14	0.02	0.023	0.038	0.18	0.037	0.18	0.19	0.087	0.097	**0.11**	0.11	0.039	0.059	0.016	0.071	<0.070
B-20-7.0	09/12/06	7	0.0066	<0.005	<0.005	<0.005	0.0069	<0.005	0.0056	0.0063	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-20-9.5	09/12/06	9.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.070
B-21-4.5	09/12/06	4.5	0.31	0.09	0.13	0.25	1	0.3	0.69	0.7	0.31	0.32	**0.21**	0.3	0.093	0.13	0.032	0.14	<0.070
B-101-10	09/19/06	10	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-101-15	09/19/06	15	<0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-201-15	09/25/06	15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--
B-201-23	09/25/06	23	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	--
B26-06	11/19/07	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B26-11	11/19/07	11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.02
B26-16	11/19/07	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B27-12	11/19/07	12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B27-19	11/19/07	19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B28-07	11/19/07	7	0.37	<0.1	0.76	1.7	14	3.2	12	14	5.4	6.0	**5.9**	4.9	2.1	3.4	0.65	3.2	<0.02
B28-12	11/19/07	12	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B29-06	11/19/07	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
B29-11.5	11/19/07	11.5	0.012	<0.01	<0.01	<0.01	0.014	<0.01	0.026	0.030	0.013	0.015	0.017	0.015	<0.01	0.012	<0.01	0.012	--
B30-07	11/20/07	7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
MTCA Method A Soil Cleanup			5.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.1	NE	NE	NE	NE	NE	NE

Table 3
Summary of Soil Analytical Results for Polycyclic Aromatic Compounds
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (Feet)	Analytical Results [1]																
			Naphthalene	Acenapthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene	Pentachlorophenol
B30-13	11/20/07	13	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B31-11.5	11/20/07	11.5	0.26	0.011	0.022	0.039	0.14	0.023	0.085	0.089	0.028	0.037	0.043	0.051	0.016	0.041	<0.01	0.039	--
B31-14	11/20/07	14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B32-11	11/20/07	11	0.042	<0.01	<0.01	<0.01	0.036	<0.01	0.027	0.026	<0.01	<0.01	<0.01	0.010	<0.01	<0.01	<0.01	<0.01	--
B32-15	11/20/07	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B33-09	11/20/07	9	0.010	<0.01	<0.01	<0.01	0.029	<0.01	0.011	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B33-16	11/20/07	16	0.013	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B34-09	11/20/07	9	2.7	<1	6.0	18	120	25	78	89	27	31	**29**	29	9.6	16	2.9	17	--
B34-16	11/20/07	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B38-07	11/22/07	7	0.019	<0.01	<0.01	<0.01	0.039	<0.01	0.052	0.057	0.023	0.030	0.031	0.033	0.012	0.026	<0.01	0.027	--
B38-12	11/23/07	12	0.16	0.021	0.011	0.015	0.060	0.010	0.043	0.046	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B39-05.5	11/24/07	5.5	0.035	<0.01	<0.01	<0.01	0.033	<0.01	0.054	0.052	0.022	0.027	0.022	0.032	0.012	0.019	<0.01	0.020	--
B39-10.5	11/25/07	10.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B40-05.25	11/26/07	5.25	**28**	<1	5.6	10	40	8.6	18	20	5.7	6.5	**5.4**	4.4	2.0	3.1	<1	2.9	--
B40-11.5	11/27/07	11.5	0.074	<0.01	<0.01	0.017	0.062	0.011	0.026	0.030	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B41-03	11/21/07	3	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B41-18	11/21/07	18	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B42-01	11/21/07	1	<0.01	<0.01	<0.01	<0.01	0.41	0.11	0.36	0.46	0.20	0.27	**0.27**	0.34	0.12	0.35	<0.1	0.28	--
B42-06	11/21/07	6	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B42-12.5	11/21/07	12.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B43-10	11/21/07	10	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B43-17	11/21/07	17	<0.01	<0.01	<0.01	<0.01	0.020	<0.01	0.012	0.014	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B44-11	11/21/07	11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B44-16	11/21/07	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B45-11.5	11/21/07	11.5	0.034	<0.01	<0.01	0.014	0.090	0.018	0.10	0.12	0.041	0.047	0.044	0.044	0.014	0.027	<0.01	0.029	--
B45-15	11/21/07	15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B46-05	11/27/07	5	0.067	<0.01	0.15	0.23	0.70	0.094	0.25	0.29	0.074	0.081	0.078	0.078	0.028	0.048	<0.01	0.050	--
B46-08	11/27/07	8	0.012	<0.01	<0.01	0.021	0.044	<0.01	0.014	0.017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B47-11.5	11/27/07	11.5	0.36	0.040	0.020	0.055	0.45	0.094	0.58	0.66	0.26	0.32	**0.42**	0.44	0.14	0.29	0.054	0.27	--
B47-16	11/27/07	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B48-15	11/28/07	15	<0.01	<0.01	<0.01	<0.01	0.025	<0.01	0.013	0.015	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B51-1	04/23/08	1	--	--	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--
B52-1	04/23/08	1	--	--	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--	--
B53-11.5	06/06/08	11.5	<0.01	<0.01	<0.01	<0.01	0.037	0.011	0.056	0.061	0.027	0.028	0.031	0.032	0.011	0.021	<0.01	0.020	--
B53-16	06/06/08	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B54-11.5	06/06/08	11.5	0.096	0.044	0.060	0.083	0.52	0.16	0.73	0.79	0.40	0.44	**0.51**	0.52	0.16	0.33	0.060	0.29	--
B54-16	06/06/08	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
MTCA Method A Soil Cleanup			5.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.1	NE	NE	NE	NE	NE	NE

Table 3
Summary of Soil Analytical Results for Polycyclic Aromatic Compounds
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (Feet)	Analytical Results 1																
			Naphthalene	Acenapthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Indeno(1,2,3-cd) pyrene	Dibenz(a,h) anthracene	Benzo(g,h,i) perylene	Pentachlorophenol
B55-11.5	06/06/08	11.5	**7.4**	21	15	24	140	40	160	170	82	92	**110**	110	42	73	13	64	--
B55-16	06/06/08	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B56-09	06/06/08	9	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	0.027	0.034	0.014	0.015	0.015	0.015	<0.01	0.011	<0.01	0.011	--
B56-16	06/06/08	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B57-09	06/06/08	9	<0.01	<0.01	<0.01	<0.01	0.027	<0.01	0.037	0.046	0.022	0.025	0.030	0.027	0.012	0.022	<0.01	0.021	--
B57-16	06/06/08	16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B60-11.5	06/17/08	11.5	<0.01	<0.01	<0.01	<0.01	0.018	<0.01	0.031	0.036	0.016	0.018	0.020	0.018	<0.01	0.015	<0.01	0.013	--
B60-16	06/17/08	16	0.013	<0.01	<0.01	<0.01	0.013	<0.01	0.019	0.022	<0.01	0.012	0.014	0.011	<0.01	0.012	<0.01	0.011	--
B61-03	08/01/08	3	**490**	110	130	200	620	200	350	350	160	170	**140**	120	54	76	17	64	--
B61-05	08/01/08	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
B62-03	08/01/08	3	**41**	16	36	51	240	64	200	190	82	91	**94**	83	31	60	12	52	--
B62-05	08/01/08	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	--
MTCA Method A Soil Cleanup			5.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.1	NE	NE	NE	NE	NE	NE

NOTES:

Results reported in mg/kg.

RED indicates concentration exceeds MTCA Method A Soil Cleanup Levels for unrestricted land use.

Laboratory analysis performed by Friedman & Bruya, Inc. of Seattle, Washington.

[1] Analyzed by EPA Method 8270C SIM.

[2] MTCA Cleanup Regulation, Table 740-1 Method A Soil Cleanup Levels for Unrestricted Land Uses of Chapter 173-340-900, of the Washington Adminsitrative Code. Revised November 2007.

-- = not analyzed
< = not detected at a concentration exceeding the laboratory reporting limit
EPA = United States Environmental Protection Agency
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
NE = cleanup level not established

Table 4
Summary of Soil Analytical Results For Total Metals
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[2]	Selenium[1]	Silver[1]
B-01-5.5	09/28/05	5.5	<7.0	51	<1.0	12	67	<0.075	<10	<1.0
B-02-9	09/28/05	9	<7.0	59	1.0	12	64	<0.058	<10	<1.0
B-03-4.0	09/28/05	4.0	<7.0	17	<1.0	5.3	<2.0	<0.038	<10	<1.0
B-04-5.5	09/28/05	5.5	**25**	28	<1.0	10	7.9	<0.071	<10	<1.0
B-05-9	09/28/05	9	<7.0	63	<1.0	6.7	49	<0.055	<10	<1.0
B-06-15	09/06/06	15	3.11	44	<1	13.9	4.27	<0.2	3.11	<1
B-06-19	09/06/06	19	3.07	47	<1	14	3.67	<0.2	<1	<1
B-06-23	09/06/06	23	2.19	27.4	<1	10.2	2.09	<0.2	<1	<1
B-06-29	09/06/06	29	2.13	43.2	<1	13.3	2.35	<0.2	<1	<1
B-07-10.5	09/07/06	10.5	1.78	9.8	<1	9.17	1.81	<0.2	1.7	<1
B-07-12.5	09/07/06	12.5	1.6	24.3	<1	12.8	2.04	<0.2	1.1	<1
B-07-29	09/07/06	29	3.06	54.7	<1	23.1	3.37	<0.2	1.76	<1
B-08-4.0	09/07/06	4	**23.4**	29	<1	14.6	77	<0.2	10.2	<1
B-08-11.5	09/07/06	11.5	2.64	55.7	<1	21	3.32	<0.2	1.95	<1
B-08-19.5	09/07/06	19.5	**20.3**	183	<1	33.6	8.97	<0.2	<1	<1
B-09-7.5	09/07/06	7.5	3.22	47	<1	17.6	3.4	<0.2	2.64	<1
B-09-9.5	09/07/06	9.5	1.25	8.44	<1	7.88	1.57	<0.2	1.62	<1
B-10-5.75	09/07/06	5.75	4.66	38.5	<1	14.4	4.58	<0.2	1.55	<1
B-10-15	09/07/06	15	2.83	31	<1	20.5	4.03	<0.2	1.31	<1
B-11-10.5	09/08/06	10.5	2.81	23.9	<1	17.6	3.22	<0.2	1.33	<1
B-11-13.5	09/08/06	13.5	1.84	20.2	<1	10.0	1.96	<0.2	<1	<1
B-11-20	09/08/06	20	3.46	93.2	<1	14.7	78.5	<0.2	1.5	<1
B-12-2.5	09/08/06	2.5	2.21	67.8	<1	25.1	4.94	<0.2	<1	<1
B-12-4.0	09/08/06	4	1.46	23.6	<1	10.9	2.09	<0.2	1.36	<1
B-12-16	09/08/06	16	<1	21.6	<1	15.6	2.08	<0.2	1.97	<1
B-13-4.5	09/11/06	4.5	2.47	16.2	<1	9.99	1.56	<0.2	<1	<1
B-13-9.5	09/11/06	9.5	<1	18.8	<1	8.58	1.59	<0.2	<1	<1
B-14-4.0	09/11/06	4	<1	29.7	<1	9.13	3.33	<0.2	<1	<1
MTCA Cleanup Levels for Soil			20[a]	NE	2[a]	19/2,000[a/b]	250[a]	2[a]	NE	NE

Table 4
Summary of Soil Analytical Results For Total Metals
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[2]	Selenium[1]	Silver[1]
B-14-6.0	09/11/06	6	<1	16.2	<1	6.32	1.48	<0.2	<1	<1
B-14-9.0	09/11/06	9	<1	15.1	<1	7.26	1.43	<0.2	<1	<1
B-15-4.5	09/11/06	4.5	4.24	20	<1	10.6	1.66	<0.2	<1	<1
B-15-8.5	09/11/06	8.5	1.64	18.8	<1	10.1	1.4	<0.2	<1	<1
B-16-7.0	09/11/06	7	<1	26.9	<1	9.56	2.14	<0.2	<1	<1
B-16-11.5	09/11/06	11.5	2.63	20.8	<1	12.1	1.67	<0.2	<1	<1
B-17-7.0	09/12/06	7	<1	7.43	<1	5.2	1.05	<0.2	<1	<1
B-17-13.5	09/12/06	13.5	**21.4**	143	<1	31.3	10.1	<0.2	<1	<1
B-17-25	09/12/06	25	3.36	20.8	<1	11.4	1.53	<0.2	<1	<1
B-18-9.0	09/12/06	9	<1	17.7	<1	7.82	1.25	<0.2	<1	<1
B-19-6.0	09/12/06	6	7.58	114	<1	41.3	5.92	<0.2	<1	<1
B-19-11.5	09/12/06	11.5	<1	18.2	<1	6.8	1.17	<0.2	<1	<1
B-22-0.5	11/17/06	0.5	15.9	--	--	--	150	--	--	--
B-22-1.5	11/17/06	1.5	4.4	--	--	--	--	--	--	--
B-22-2.5	11/17/06	2.5	4.07	--	--	--	--	--	--	--
B-22-3.0	11/17/06	3	2.38	--	--	--	--	--	--	--
B-22-5.0	11/17/06	5	<1	--	--	--	--	--	--	--
B-22-9.0	11/17/06	9	2.19	--	--	--	--	--	--	--
B-22-18.0	11/17/06	18	8.45	--	--	--	--	--	--	--
B-22-14.0	11/17/06	14	2	--	--	--	--	--	--	--
B-23-1.0	11/17/06	1	13.8	--	--	--	--	--	--	--
B-23-2.0	11/17/06	2	3.7	--	--	--	--	--	--	--
B-23-3.5	11/17/06	3.5	2.61	--	--	--	--	--	--	--
B-23-5.0	11/17/06	5	2.08	--	--	--	--	--	--	--
B-23-11.0	11/17/06	11	2.4	--	--	--	--	--	--	--
B-24-1.0	11/17/06	1	3.34	--	--	--	--	--	--	--
B-24-2.0	11/17/06	2	<1	--	--	--	--	--	--	--
B-24-3.0	11/17/06	3	1.76	--	--	--	--	--	--	--
MTCA Cleanup Levels for Soil			20[a]	NE	2[a]	19/2,000[a/b]	250[a]	2[a]	NE	NE

Table 4
Summary of Soil Analytical Results For Total Metals
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[2]	Selenium[1]	Silver[1]
B-24-5.0	11/17/06	5	<1	--	--	--	--	--	--	--
B-24-11.0	11/17/06	11	2.91	--	--	--	--	--	--	--
B-25-1.0	11/17/06	1	3.01	--	--	--	--	--	--	--
B-25-5.0	11/17/06	5	1.56	--	--	--	--	--	--	--
B-25-11.0	11/17/06	11	9.73	--	--	--	--	--	--	--
B-25-24.0	11/17/06	24	1.99	--	--	--	--	--	--	--
B-201-15	09/25/06	15	1.48	36.2	<1	15.8	2.36	<0.2	<1	<1
B-201-23	09/25/06	23	1.33	18	<1	7.09	1.29	<0.2	<1	<1
Ballast-Fines	11/17/06	0.5	**76.2**	--	--	--	**298**	--	--	--
B26-06	11/20/07	6	3.66	--	--	--	--	--	--	--
B26-16	11/20/07	16	1.76	--	--	--	--	--	--	--
B27-04	11/20/07	4	2.07	--	--	--	--	--	--	--
B27-12	11/20/07	12	**25.0**	--	--	--	--	--	--	--
B27-19	11/20/07	19	1.83	--	--	--	--	--	--	--
B28-07	11/20/07	7	**23.6**	--	--	--	--	--	--	--
B28-12	11/20/07	12	1.37	--	--	--	--	--	--	--
B29-03	11/20/07	3	1.94	--	--	--	--	--	--	--
B29-06	11/20/07	6	1.63	--	--	--	--	--	--	--
B29-11.5	11/20/07	11.5	9.09	--	--	--	--	--	--	--
B30-02	11/20/07	2	1.59	--	--	--	--	--	--	--
B30-07	11/20/07	7	2.55	--	--	--	--	--	--	--
B30-13	11/20/07	13	7.41	--	--	--	--	--	--	--
B31-04	11/20/07	4	1.88	--	--	--	--	--	--	--
B31-11.5	11/20/07	11.5	**20.4**	--	--	--	--	--	--	--
B31-14	11/20/07	14	1.18	--	--	--	--	--	--	--
B32-02	11/20/07	2	<1	--	--	--	--	--	--	--
B32-11	11/20/07	11	**21.8**	--	--	--	--	--	--	--
B32-15	11/20/07	15	5.42	--	--	--	--	--	--	--
MTCA Cleanup Levels for Soil			20[a]	NE	2[a]	19/2,000[a/b]	250[a]	2[a]	NE	NE

Table 4
Summary of Soil Analytical Results For Total Metals
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[2]	Selenium[1]	Silver[1]
B33-01	11/20/07	1	8.87	--	--	--	--	--	--	--
B33-09	11/20/07	9	1.98	--	--	--	--	--	--	--
B33-16	11/20/07	16	2.28	--	--	--	--	--	--	--
B34-05	11/20/07	5	<1	--	--	--	--	--	--	--
B34-09	11/20/07	9	2.35	--	--	--	--	--	--	--
B34-16	11/20/07	16	1.24	--	--	--	--	--	--	--
B35-02	11/21/07	2	2.73	--	--	--	--	--	--	--
B35-09	11/21/07	9	2.82	--	--	--	--	--	--	--
B35-17.5	11/21/07	17.5	7.80	--	--	--	--	--	--	--
B36-02	11/21/07	2	16.9	--	--	--	--	--	--	--
B36-07	11/21/07	7	7.94	--	--	--	--	--	--	--
B36-14	11/21/07	14	3.27	--	--	--	--	--	--	--
B37-0.75	11/21/07	0.75	15.2	--	--	--	--	--	--	--
B37-02.5	11/21/07	2.5	1.52	--	--	--	--	--	--	--
B37-12	11/21/07	12	4.11	--	--	--	--	--	--	--
B38-02	11/21/07	2	3.77	--	--	--	--	--	--	--
B38-07	11/21/07	7	7.51	--	--	--	--	--	--	--
B38-12	11/21/07	12	3.86	--	--	--	--	--	--	--
B39-05.5	11/21/07	5.5	10.0	--	--	--	--	--	--	--
B39-10.5	11/21/07	10.5	1.14	--	--	--	--	--	--	--
B40-05.25	11/21/07	5.25	1.24	--	--	--	--	--	--	--
B40-11.5	11/21/07	11.5	1.74	--	--	--	--	--	--	--
B41-01	11/21/07	1	9.17	--	--	--	--	--	--	--
B41-03	11/21/07	3	5.10	--	--	--	--	--	--	--
B41-18	11/21/07	18	<1	--	--	--	--	--	--	--
B42-06	11/21/07	6	<1	--	--	--	--	--	--	--
B42-12.5	11/21/07	12.5	5.11	--	--	--	--	--	--	--
B43-01	11/21/07	1	7.95	--	--	--	--	--	--	--
MTCA Cleanup Levels for Soil			20[a]	NE	2[a]	19/2,000[a/b]	250[a]	2[a]	NE	NE

Table 4
Summary of Soil Analytical Results For Total Metals
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[2]	Selenium[1]	Silver[1]
B43-10	11/21/07	10	2.12	--	--	--	--	--	--	--
B43-17	11/21/07	17	**66.0**	--	--	--	--	--	--	--
B44-01	11/21/07	1	**45.4**	--	--	--	--	--	--	--
B44-11	11/21/07	11	2.02	--	--	--	--	--	--	--
B44-16	11/21/07	16	<1	--	--	--	--	--	--	--
B45-01	11/21/07	1	8.12	--	--	--	--	--	--	--
B45-11.5	11/21/07	11.5	10.4	--	--	--	--	--	--	--
B45-15	11/21/07	15	12.9	--	--	--	--	--	--	--
B46-05	11/27/07	5	2.00	--	--	--	--	--	--	--
B46-08	11/27/07	8	6.98	--	--	--	--	--	--	--
B47-05.5	11/27/07	5.5	2.14	--	--	--	--	--	--	--
B47-11.5	11/27/07	11.5	13.4	--	--	--	--	--	--	--
B47-16	11/27/07	16	1.04	--	--	--	--	--	--	--
B48-06	11/28/07	6	1.59	--	--	--	--	--	--	--
B48-15	11/28/07	15	1.68	--	--	--	--	--	--	--
B49-05.5	11/29/07	5.5	6.66	--	--	--	--	--	--	--
B49-10.5	11/29/07	10.5	2.28	--	--	--	--	--	--	--
RR01-0.5	11/20/07	0.5	**87.8**	--	--	--	236	--	--	--
RR01-1.25	11/20/07	1.25	13.8	--	--	--	89.3	--	--	--
RR01-02	11/20/07	2.0	3.63	--	--	--	21.3	--	--	--
RR02-0.5	11/20/07	0.5	**93.3**	--	--	--	248	--	--	--
RR02-1.25	11/20/07	1.25	**28.9**	--	--	--	137	--	--	--
RR02-02	11/20/07	2.0	6.39	--	--	--	23.9	--	--	--
RR03-0.5	11/20/07	0.5	14.0	--	--	--	111	--	--	--
RR03-1.25	11/20/07	1.25	8.62	--	--	--	23.3	--	--	--
RR03-02	11/20/07	2.0	3.18	--	--	--	7.06	--	--	--
RR04-0.5	11/20/07	0.5	6.16	--	--	--	22.5	--	--	--
RR04-1.25	11/20/07	1.25	12.5	--	--	--	28.6	--	--	--
MTCA Cleanup Levels for Soil			20[a]	NE	2[a]	19/2,000[a/b]	250[a]	2[a]	NE	NE

Table 4
Summary of Soil Analytical Results For Total Metals
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Arsenic[1]	Barium[1]	Cadmium[1]	Chromium[1]	Lead[1]	Mercury[2]	Selenium[1]	Silver[1]
RR04-02	11/20/07	2.0	**28.6**	--	--	--	12.8	--	--	--
RR05-0.5	11/20/07	0.5	4.42	--	--	--	20.9	--	--	--
RR05-1.25	11/20/07	1.25	5.07	--	--	--	12.3	--	--	--
RR05-02	11/20/07	2.0	8.45	--	--	--	8.23	--	--	--
RR06-0.5	11/20/07	0.5	2.63	--	--	--	21.0	--	--	--
RR06-1.25	11/20/07	1.25	4.18	--	--	--	11.8	--	--	--
RR06-02	11/20/07	2.0	3.50	--	--	--	10.3	--	--	--
RR07-0.5	11/21/07	0.5	5.00	--	--	--	57.1	--	--	--
RR07-1.25	11/21/07	1.25	5.95	--	--	--	157	--	--	--
RR07-02	11/21/07	2.0	3.49	--	--	--	9.58	--	--	--
RR08-0.5	11/21/07	0.5	2.10	--	--	--	52.7	--	--	--
RR08-1.25	11/21/07	1.25	2.62	--	--	--	9.26	--	--	--
RR08-02	11/21/07	2.0	2.49	--	--	--	10.1	--	--	--
RR09-0.5	11/21/07	0.5	2.32	--	--	--	3.50	--	--	--
RR09-1.25	11/21/07	1.25	12.9	--	--	--	103	--	--	--
RR09-02	11/21/07	2.0	8.09	--	--	--	110	--	--	--
RR10-0.5	11/21/07	0.5	**32.2**	--	--	--	**276**	--	--	--
RR10-1.25	11/21/07	1.25	2.52	--	--	--	28.9	--	--	--
RR10-02	11/21/07	2.0	2.20	--	--	--	11.4	--	--	--
MTCA Cleanup Levels for Soil			20[a]	NE	2[a]	19/2,000[a/b]	250[a]	2[a]	NE	NE

NOTES:

All results measured in mg/kg.

RED indicates concentration exceeds MTCA Method A Soil Cleanup Levels for unrestricted land use.

[1] Samples analyzed by Friedman & Bruya, Inc. of Seattle, Washington using EPA Method 200.8.

[2] Samples analyzed by Analytical Resources, Incorporated of Tukwila, Washington using EPA Method 6010.

[a] MTCA Cleanup Regulation 173-340-900, Table 740-1, Method A Soil Cleanup Levels for Unrestricted Land Use.

[b] Chromium cleanup levels are 19 mg/kg for chromium VI and 2,000 mg/kg for chromium III.

< = not detected at a concentration exceeding the laboratory reporting limit

-- = not analyzed

mg/kg = milligrams per kilogram

EPA = United States Environmental Protection Agency

MTCA = Model Toxics Control Act

NE = not established; MTCA cleanup levels for barium, selenium, and silver have been researched with no data

Table 5
Summary of Soil Analytical Results for Volatile Organic Compounds
Former Wesmar Property
1401 and 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Sample Date	Depth (feet)	GRPH[1]	DRPH[2]	ORPH[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]	Tetrachloro-ethene[3]	Trichloro-ethene[3]	cis-1,2-Dichloro-ethene[3]	Vinyl chloride[3]
B-01-5.5	09/28/05	5.5	--	410	--	--	--	--	--	--	--	--	--
B-02-9	09/28/05	9	--	67	--	--	--	--	--	--	--	--	--
B-02-12	09/28/05	12	--	<50	--	--	--	--	--	--	--	--	--
B-03-4.0	09/28/05	4.0	--	<50	--	--	--	--	--	--	--	--	--
B-04-5.5	09/28/05	5.5	--	<50	<250	--	--	--	--	--	--	--	--
B-05-4.5	09/28/05	4.5	--	<50	<250	--	--	--	--	--	--	--	--
B-06-15	09/06/06	15	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-06-19	09/06/06	19	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-06-23	09/06/06	23	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-06-29	09/06/06	29	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-07-10.5	09/07/06	10.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-07-12.5	09/07/06	12.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-07-29	09/07/06	29	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-08-11.5	09/07/06	11.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-08-19.5	09/07/06	19.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-08-4.0	09/07/06	4	<2	**2,200**	**5,000**	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-09-7.5	09/07/06	7.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-09-9.5	09/07/06	9.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-101-10	09/19/06	10	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-101-15	09/19/06	15	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-10-15	09/07/06	15	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-10-5.75	09/07/06	5.75	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-11-10.5	09/08/06	10.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-11-13.5	09/08/06	13.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-11-20	09/08/06	20	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-12-16	09/08/06	16	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-12-2.5	09/08/06	2.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-12-4.0	09/08/06	4	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-13-4.5	09/11/06	4.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-13-9.5	09/11/06	9.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-14-4.0	09/11/06	4	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-14-6.0	09/11/06	6	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-14-9.0	09/11/06	9	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-15-4.5	09/11/06	4.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-15-8.5	09/11/06	8.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-16-11.5	09/11/06	11.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-16-4.5	09/11/06	4.5	--	--	--	**0.04**	0.64	0.17	1.13	<0.05	**0.04**	<0.05	<0.05
B-16-4.5	09/11/06	4.5	--	--	--	<0.3	1	<0.5	<1	<0.5	<0.3	<0.5	<0.5
B-16-7.0	09/11/06	7	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-16-9.0	09/11/06	9	--	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-17-13.5	09/12/06	13.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
MTCA Method A Soil Cleanup Levels[4]			100/30[a]	2,000	2,000	0.03	7	6	9	0.05	0.03	NE	NE

Table 5
Summary of Soil Analytical Results for Volatile Organic Compounds
Former Wesmar Property
1401 and 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Sample Date	Depth (feet)	GRPH^{1}	DRPH^{2}	ORPH^{2}	Benzene^{3}	Toluene^{3}	Ethylbenzene^{3}	Total Xylenes^{3}	Tetrachloro-ethene^{3}	Trichloro-ethene^{3}	cis-1,2-Dichloro-ethene^{3}	Vinyl chloride^{3}
B-17-25	09/12/06	25	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-17-7.0	09/12/06	7	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-18-9.0	09/12/06	9	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-19-11.5	09/12/06	11.5	<2	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-19-6.0	09/12/06	6	4	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-19-8.0	09/12/06	8	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-20-5.0	09/12/06	5	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-20-7.0	09/12/06	7	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B-21-4.5	09/12/06	4.5	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.05	<0.03	<0.05	<0.05
B26-11	11/19/07	11	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.025	<0.03	<0.05	<0.05
B28-07	11/19/07	7	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.025	<0.03	<0.05	<0.05
B29-06	11/19/07	6	--	--	--	<0.03	<0.05	<0.05	<0.1	<0.025	<0.03	<0.05	<0.05
B49-10.5	11/29/07	10.5	3	<50	<250	<0.03	<0.05	<0.05	<0.1	<0.025	<0.03	<0.05	<0.05
B53-11.5	06/06/08	11.5	--	<50	<250	--	--	--	--	--	--	--	--
B53-16	06/06/08	16	--	<50	<250	--	--	--	--	--	--	--	--
B54-11.5	06/06/08	11.5	--	<50	<250	--	--	--	--	--	--	--	--
B54-16	06/06/08	16	--	<50	<250	--	--	--	--	--	--	--	--
B55-11.5	06/06/08	11.5	--	1,400	**2,800**	--	--	--	--	--	--	--	--
B55-16	06/06/08	16	--	<50	<250	--	--	--	--	--	--	--	--
B56-09	06/06/08	9	--	<50	<250	--	--	--	--	--	--	--	--
B56-16	06/06/08	16	--	<50	<250	--	--	--	--	--	--	--	--
B57-09	06/06/08	9	--	<50	<250	--	--	--	--	--	--	--	--
B57-16	06/06/08	16	--	<50	<250	--	--	--	--	--	--	--	--
B61-03	08/01/08	3	--	**16,000**	**8,900**	--	--	--	--	--	--	--	--
B62-03	08/01/08	3	--	1,900	**3,100**	--	--	--	--	--	--	--	--
MTCA Method A Soil Cleanup Levels^{4}			100/30^{a}	2,000	2,000	0.03	7	6	9	0.05	0.03	NE	NE

NOTES:

All results measured in mg/kg.

RED indicates concentration exceeds MTCA Method A Soil Cleanup Levels for unrestricted land use.

Laboratory analysis performed by Friedman & Bruya, Inc. of Seattle, Washington.

[1] Analyzed by Northwest Method NWTPH-Gx.

[2] Analyzed by Northwest Method NWTPH-Dx.

[3] Analyzed by EPA Method 8260B.

[4] MTCA Cleanup Regulation 173-340-900, Table 740-1, Method A Soil Cleanup Levels for Unrestricted Land Use.

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

< = not detected at a concentration exceeding the laboratory reporting limit
-- = not analyzed
mg/kg = milligrams per kilogram
DRPH = diesel-range petroleum hydrocarbons
EPA = United States Environmental Protection Agency
GRPH = gasoline-range petroleum hydrocarbons
MTCA = Model Toxics Control Act
NE = not established
ORPH = oil-range petroleum hydrocarbons

Table 6
Toxicity Equivalent Soil Concentrations
for Carcinogenic Polycyclic Aromatic Hydrocarbons
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Analytical Results [1]							
			Benz(a)anthracene TEF (0.1)	Chrysene TEF (0.01)	Benzo(a)pyrene TEF (1)	Benzo(b) fluoranthene TEF (0.1)	Benzo(k) fluoranthene TEF (0.1)	Indeno(1,2,3-cd) pyrene TEF (0.1)	Dibenz(a,h) anthracene TEF (0.1)	Total Toxicity Equivalent Soil Concentration
B-1-5.5	09/28/05	5.5	0.53	0.059	**6.4**	0.61	0.22	0.2	0.061	**8.08**
B-2-9	09/28/05	9	0.075	0.0075	**0.75**	0.075	0.15	0.075	0.075	**1.2075**
B-3-4.0	09/28/05	4	0.0015	0.00015	0.015	0.0015	0.003	0.0015	0.0015	0.02415
B-4-5.5	09/28/05	5.5	0.051	0.0061	**0.64**	0.073	0.026	0.02	0.0048	**0.8209**
B-5-4.5	09/28/05	4.5	0.17	0.019	**1.8**	0.16	0.003	0.062	0.015	**2.229**
B-06-15	09/06/06	15	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-06-19	09/06/06	19	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-06-23	09/06/06	23	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-06-29	09/06/06	29	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-07-10.5	09/07/06	10.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-07-12.5	09/07/06	12.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-07-29	09/07/06	29	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-08-4.0	09/07/06	4	3.2	0.33	**35**	2.9	1.1	--	0.45	**42.98**
B-08-11.5	09/07/06	11.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-08-19.5	09/07/06	19.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-09-7.5	09/07/06	7.5	0.0025	0.00025	0.025	0.0025	0.0025	0.0025	0.0025	0.03775
B-09-9.5	09/07/06	9.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-10-5.75	09/07/06	5.75	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-10-15	09/07/06	15	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-11-10.5	09/08/06	10.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-11-13.5	09/08/06	13.5	0.0006	0.00007	0.0025	0.00025	0.00025	0.00025	0.00025	0.00417
B-11-20	09/08/06	20	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-12-2.5	09/08/06	2.5	0.024	0.0026	**0.37**	0.032	0.014	0.025	0.006	**0.4736**
B-12-4.0	09/08/06	4	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-12-16	09/08/06	16	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-13-4.5	09/11/06	4.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-13-9.5	09/11/06	9.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-14-4.0	09/11/06	4	0.01	0.0013	**0.2**	0.022	0.009	0.019	0.005	**0.2663**
B-14-6.0	09/11/06	6	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-14-9.0	09/11/06	9	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-15-4.5	09/11/06	4.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-15-8.5	09/11/06	8.5	0.0015	0.00015	0.015	0.0015	0.0015	0.0015	0.0015	0.02265
B-16-4.5	09/11/06	4.5	12	1.2	**120**	10	4.1	6.5	1.7	**155.5**
B-16-7.0	09/11/06	7	0.0009	9.3E-05	0.0089	0.00087	0.00025	0.00025	0.00025	0.011513
B-16-9.0	09/11/06	9	--	--	--	--	--	--	--	--
MTCA Method A Soil Cleanup Levels[2]			NA	NA	0.1	NA	NA	NA	NA	0.1

Table 6
Toxicity Equivalent Soil Concentrations
for Carcinogenic Polycyclic Aromatic Hydrocarbons
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Analytical Results [1]							
			Benz(a)anthracene TEF (0.1)	Chrysene TEF (0.01)	Benzo(a)pyrene TEF (1)	Benzo(b) fluoranthene TEF (0.1)	Benzo(k) fluoranthene TEF (0.1)	Indeno(1,2,3-cd) pyrene TEF (0.1)	Dibenz(a,h) anthracene TEF (0.1)	Total Toxicity Equivalent Soil Concentration
B-16-11.5	09/11/06	11.5	0.003	0.0003	0.03	0.0021	0.00084	0.0012	0.00025	0.03769
B-17-7.0	09/12/06	7	0.00025	2.5E-05	0.015	0.00025	0.00025	0.00025	0.00025	0.016275
B-17-13.5	09/12/06	13.5	0.0051	0.0012	0.06	0.012	0.0032	0.0052	0.0016	0.0883
B-17-25	09/12/06	25	0.0015	2.5E-05	0.015	0.00025	0.00025	0.00025	0.00025	0.017525
B-18-3.0	09/12/06	3	0.003	0.00034	0.034	0.0053	0.0018	0.0032	0.00086	0.0485
B-18-7.0	09/12/06	7	0.003	0.00031	0.027	0.0025	0.0011	0.0011	0.00025	0.03526
B-18-9.0	09/12/06	9	0.0015	2.5E-05	0.015	0.00025	0.00025	0.00025	0.00025	0.017525
B-18-12.5	09/12/06	12.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-18-19.5	09/12/06	19.5	0.00051	2.5E-05	0.0055	0.00053	0.00025	0.00025	0.00025	0.007315
B-19-6.0	09/12/06	6	0.54	0.056	**4.9**	0.4	0.025	0.025	0.025	**5.971**
B-19-8.0	09/12/06	8	0.001	0.00011	0.0094	0.00092	0.00025	0.00025	0.00025	0.01218
B-19-11.5	09/12/06	11.5	0.003	0.0004	0.015	0.003	0.00085	0.0013	0.00025	0.0238
B-19-14	09/12/06	14	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-19-15	09/12/06	15	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-20-5.0	09/12/06	5	0.0087	0.00097	**0.11**	0.011	0.0039	0.0059	0.0016	**0.14207**
B-20-7.0	09/12/06	7	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-20-9.5	09/12/06	9.5	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-21-4.5	09/12/06	4.5	0.031	0.0032	**0.21**	0.03	0.0093	0.013	0.0032	**0.2997**
B-101-10	09/19/06	10	--	--	--	--	--	--	--	--
B-101-15	09/19/06	15	--	--	--	--	--	--	--	--
B-201-15	09/25/06	15	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B-201-23	09/25/06	23	0.00025	2.5E-05	0.0025	0.00025	0.00025	0.00025	0.00025	0.003775
B26-06	11/19/07	6	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B26-11	11/19/07	11	--	--	--	--	--	--	--	--
B26-16	11/19/07	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B27-12	11/19/07	12	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B27-19	11/19/07	19	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B28-07	11/19/07	7	0.54	0.06	**5.9**	0.49	0.21	0.34	0.065	**7.605**
B28-12	11/19/07	12	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B29-06	11/19/07	6	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B29-11.5	11/19/07	11.5	0.0013	0.00015	0.017	0.0015	0.0005	0.0012	0.0005	0.02215
B30-07	11/20/07	7	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B30-13	11/20/07	13	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B31-11.5	11/20/07	11.5	0.003	0.00037	0.043	0.0051	0.0016	0.0041	0.0005	0.05747
MTCA Method A Soil Cleanup Levels[2]			NA	NA	0.1	NA	NA	NA	NA	0.1

Table 6
Toxicity Equivalent Soil Concentrations
for Carcinogenic Polycyclic Aromatic Hydrocarbons
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Analytical Results [1]							
			Benz(a)anthracene TEF (0.1)	Chrysene TEF (0.01)	Benzo(a)pyrene TEF (1)	Benzo(b) fluoranthene TEF (0.1)	Benzo(k) fluoranthene TEF (0.1)	Indeno(1,2,3-cd) pyrene TEF (0.1)	Dibenz(a,h) anthracene TEF (0.1)	Total Toxicity Equivalent Soil Concentration
B31-14	11/20/07	14	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B32-11	11/20/07	11	0.0005	0.00005	0.005	0.001	0.0005	0.0005	0.0005	0.00805
B32-15	11/20/07	15	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B33-09	11/20/07	9	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B33-16	11/20/07	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B34-09	11/20/07	9	3	0.31	**29**	2.9	0.96	1.6	0.29	**37.76**
B34-16	11/20/07	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B38-07	11/22/07	7	0.0023	0.0003	0.031	0.0033	0.0012	0.0026	0.0005	0.0412
B38-12	11/23/07	12	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B39-05.5	11/24/07	5.5	0.0022	0.00027	0.022	0.0032	0.0012	0.0019	0.0005	0.03127
B39-10.5	11/25/07	10.5	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B40-	11/26/07	5.25	0.57	0.065	**5.4**	0.44	0.2	0.31	0.05	**7.035**
B40-11.5	11/27/07	11.5	0.0011	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00815
B41-03	11/21/07	3	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B41-18	11/21/07	18	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B42-01	11/21/07	1	0.02	0.0027	**0.27**	0.034	0.0005	0.035	0.005	**0.3672**
B42-06	11/21/07	6	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B42-12.5	11/21/07	12.5	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B43-10	11/21/07	10	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B43-17	11/21/07	17	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B44-11	11/21/07	11	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B44-16	11/21/07	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B45-11.5	11/21/07	11.5	0.004	0.00047	0.044	0.0044	0.0014	0.0027	0.0005	0.05757
B45-15	11/21/07	15	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B46-05	11/27/07	5	0.0074	0.00081	0.078	0.0078	0.0028	0.0048	0.0005	**0.10211**
B46-08	11/27/07	8	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B47-11.5	11/27/07	11.5	0.026	0.0032	**0.42**	0.044	0.014	0.029	0.0054	**0.5416**
B47-16	11/27/07	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B48-15	11/28/07	15	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B51-1	04/23/08	1	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B52-1	04/23/08	1	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B53-11.5	06/06/08	11.5	0.0027	0.00028	0.031	0.0032	0.0011	0.0021	0.001	0.04088
B53-16	06/06/08	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
MTCA Method A Soil Cleanup Levels[2]			NA	NA	0.1	NA	NA	NA	NA	0.1

Table 6
Toxicity Equivalent Soil Concentrations for Carcinogenic Polycyclic Aromatic Hydrocarbons
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Soil Sample ID	Date Sampled	Depth (feet)	Analytical Results [1]							
			Benz(a)anthracene TEF (0.1)	Chrysene TEF (0.01)	Benzo(a)pyrene TEF (1)	Benzo(b) fluoranthene TEF (0.1)	Benzo(k) fluoranthene TEF (0.1)	Indeno(1,2,3-cd) pyrene TEF (0.1)	Dibenz(a,h) anthracene TEF (0.1)	Total Toxicity Equivalent Soil Concentration
B54-11.5	06/06/08	11.5	0.04	0.0044	**0.51**	0.052	0.016	0.033	0.06	**0.7154**
B54-16	06/06/08	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B55-11.5	06/06/08	11.5	8.2	0.92	**110**	11	4.2	7.3	1.3	**142.92**
B55-16	06/06/08	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B56-09	06/06/08	9	0.0014	0.00015	0.015	0.0015	0.0005	0.0011	0.0005	0.02015
B56-16	06/06/08	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B57-09	06/06/08	9	0.0022	0.00025	0.03	0.0027	0.0012	0.0022	0.0005	0.03905
B57-16	06/06/08	16	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B60-11.5	06/17/08	11.5	0.0016	0.00018	0.020	0.0018	0.0005	0.0015	0.0005	0.02608
B60-16	06/17/08	16	0.0005	0.00012	0.014	0.0011	0.0005	0.0012	0.0005	0.01792
B61-03	08/01/08	3	16.0	1.7	**140**	12.0	5.4	7.6	6.4	**189.10**
B61-05	08/01/08	5	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
B62-03	08/01/08	3	8.2	0.91	**94**	8.3	3.1	6.0	1.2	**121.71**
B62-05	08/01/08	5	0.0005	0.00005	0.005	0.0005	0.0005	0.0005	0.0005	0.00755
MTCA Method A Soil Cleanup Levels[2]			NA	NA	0.1	NA	NA	NA	NA	0.1

NOTES:

Results reported in mg/kg.

RED indicates concentration exceeds MTCA Method A Soil Cleanup Levels.

Laboratory analysis performed by Friedman & Bruya, Inc. of Seattle, Washington.

[1] Analyzed by EPA Method 8270C.

[2] MTCA Cleanup Regulation, Chapter 173-340-900, Table 740-1 Method A Soil Cleanup Levels for Unrestricted Land Uses.

NA = not applicable
EPA = United States Environmental Protection Agency
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
TEF = toxicity equivalency factor

Table 7a
Area A
Technology Screening Matrix
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Technology Group	Technology Options	Protect Human Health and the Environment	Comply with Cleanup Standards	Comply with Applicable Local, State and Federal Laws	Provide for Compliance Monitoring	Use Permanent Solutions to the Maximum Extent Practicable	Reasonable Restoration Time Frame	Considers Public Concerns	Retained Alternative for Further Evaluation	Comments
		Threshold Criteria (WAC 173-340-360 [2][a])				Modif√ing Criteria (WAC 173-340-360 [2][b])				
Passive Remediation										
	No Further Action	X	X	X	X	X	X	√	No	Not protective of human health and the environment.
	Monitored Natural Attenuation	X	X	X	√	X	X	√	No	Not protective of human health and the environment.
	Passive Treatment Wall (Activated Carbon/PRB)	X	√	√	√	X	X	√	No	Not protective of human health and the environment.
In-Situ Ph√sical Treatment										
	Vapor Extraction (VE)	X	X	X	X	X	X	√	No	Contamination is not volatile enough at*in-situ* temperatures.
	Air Sparging	X	X	X	X	X	X	√	No	Contamination is not volatile enough at*in-situ* temperatures.
	Air Sparging with VE	X	X	X	X	X	X	√	No	Contamination is not volatile enough at*in-situ* temperatures.
	Bioslurping	X	X	X	X	X	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Surfactant Washing	√	√	√	√	X	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Cosolvent Washing	√	√	√	√	X	X	√	No	Not applicable to metal contamination.
	Pump and Treat	√	√	√	√	X	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Dual-Phase Extraction	X	X	X	X	X	X	√	No	Contamination is not volatile enough at*in-situ* temperatures.
Thermal										
	Resistive Thermal with VE	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Conductive Thermal with VE	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Radio FrequencY/Electromagnetic Thermal with VE	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Steam Injection with VE and Groundwater Extraction	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Hot Air Injection with VE	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Hot Water Injection with VE and Groundwater Extraction	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
Source Removal										
	Excavation without shoring	X	X	X	√	√	X	√	No	Contamination left in slope-back not protective of human health and the environment.
	Excavation with shoring									
	Secant Wall - Impervious wall	√	√	√	√	X	√	√	Yes	
	Sheet Pile Wall (Sealed) - Impervious wall	√	√	√	√	X	√	√	Yes	
	Soldier Pile Wall - Pervious wall	√	√	√	√	X	√	√	Yes	
	Groundwater Treatment with Shored Excavation									
	with permeable reactive barrier for groundwater	√	√	√	√	√	√	√	Yes	
	with sub-grade groundwater intrusion control sYstem	√	√	√	√	X	√	√	Yes	
	with groundwater discharge to sewer	√	√	√	√	X	√	√	Yes	
Source Removal Treatment										
	Surfactant Washing	√	√	√	√	X	√	√	Yes	
	Cosolvent Washing	X	√	√	√	X	X	√	No	Not applicable to metal contamination.
	Chemical Oxidation	X	√	√	√	√	X	√	No	Not applicable to metal contamination.
	Landfill Disposal	√	√	√	√	X	X	√	Yes	

NOTES:

In order for the option to pass the screening, all of the threshold criteria must be met.

X	Does not meet criterion
√	Does meet criterion

PAH = polycyclic aromatic hydrocarbons

PRB = permeable reactive barrier

WAC = Washington Administrative Code

Table 7a
Area A
Technology Screening Matrix
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Technology Group	Technology Options	Protect Human Health and the Environment	Comply with Cleanup Standards	Comply with Applicable Local, State and Federal Laws	Provide for Compliance Monitoring	Use Permanent Solutions to the Maximum Extent Practicable	Reasonable Restoration Time Frame	Considers Public Concerns	Retained Alternative for Further Evaluation	Comments
		Threshold Criteria (WAC 173-340-360 [2][a])				Modif√ing Criteria (WAC 173-340-360 [2][b])				
***In-Situ* Chemical Oxidation**										
	Sodium Persulfate	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Heated Sodium Persulfate	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	HYdrogen Peroxide	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Permanganate	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	RegenOx (CatalYzed Sodium Percarbonate)	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Fenton's Reagent	X	X	X	√	√	X	√	No	Not applicable to metal contamination.
	Activated Iron Wall	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
Containment / Immobilization										
	Bituminization	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	Emulsified Asphalt	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	Modified Sulfur Cement	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	PolYethYlene Extrusion	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	Pozzolan/Portland Cement	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	Vitrification/Molten Glass	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	SlurrY Wall Containment	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	Sheet Pile Wall Containment	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
	Pump and Treat for HYdraulic Containment	X	√	√	√	X	√	X	No	Does not remove contamination/Is not compatible with site development.
Ph√toremediation										
	HYdraulic Control	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	PhYto-Degradation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	PhYto-Volatilization	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	PhYto-Accumulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	PhYto-Stabilization	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Enhanced Rhizosphere Biodegradation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
In Situ Bioremediation										
	Aerobic Bio-Augmentation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Aerobic Bio-Stimulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Anaerobic Bio-Augmentation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Anaerobic Bio-Stimulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Nitrate-Enhanced Bioremediation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Sulfate-Enhanced Bioremediation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
Capping										
	Containment Cap	√	√	√	√	√	X	√	No	Due to excavation, any capping inside of shoring area will not meet a reasonable restoration time frame when coupled with proposed redevelopment timeframe.

NOTES:

In order for the option to pass the screening, all of the threshold criteria must be met.

X	Does not meet criterion
√	Does meet criterion

PAH = polycyclic aromatic hydrocarbons

PRB = permeable reactive barrier

WAC = Washington Administrative Code

Table 7b
Area B
Alternative Screening Matrix
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Technology Group	Technology Options	Protect Human Health and the Environment	Comply with Cleanup Standards	Comply with Applicable Local, State and Federal Laws	Provide for Compliance Monitoring	Use Permanent Solutions to the Maximum Extent Practicable	Reasonable Restoration Time Frame	Considers Public Concerns	Retained Alternative for Further Evaluation	Comments
		Threshold Criteria(WAC 173-340-360 [2][a])				Modifying Criteria (WAC 173-340-360 [2][b])				
Passive Remediation										
	No Further Action	X	X	X	X	X	X	√	No	Not protective of human health and the environment.
	Monitored Natural Attenuation	X	X	X	√	X	X	√	No	Not protective of human health and the environment.
	Passive Treatment Wall (Activated Carbon/PRB)	√	√	√	√	X	X	√	No	Not protective of human health and the environment.
***In-Situ* Physical Treatment**										
	Vapor Extraction (VE)	X	X	X	X	√	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
	Air Sparging	X	X	X	X	√	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
	Air Sparging with VE	X	X	X	X	√	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
	Bioslurping	X	X	X	X	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Surfactant Washing	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame and incompatible with utilities.
	Cosolvent Washing	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Pump and Treat	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Dual-Phase Extraction	X	X	X	X	√	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
Thermal										
	Resistive Thermal with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Conductive Thermal with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Radio Frequency/Electromagnetic Thermal with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Steam Injection with VE and Groundwater Extraction	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Hot Air Injection with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Hot Water Injection with VE and Groundwater Extraction	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
Source Removal										
	Excavation without shoring	X	X	X	√	X	X	√	No	Contamination left in slope-back not protective of human health and the environment.
	Excavation with shoring	√	√	√	√	X	√	√	Yes	
Source Removal Treatment										
	Surfactant Washing	√	√	√	√	X	√	√	Yes	Only retained if excavation is selected.
	Cosolvent Washing	√	√	√	√	X	X	√	No	Not applicable to metal contamination.
	Chemical Oxidation	√	√	√	√	√	X	√	No	Not applicable to metal contamination.
	Landfill Disposal	√	√	√	√	X	√	√	Yes	Only retained if excavation is selected.

NOTES:

In order for the option to pass the screening, all threshold criteria must be met.

X	Does not meet criterion
√	Does meet criterion

PAH = polycyclic aromatic hydrocarbons
PRB = permeable reactive barrier
WAC = Washington Administrative Code

Table 7b
Area B
Alternative Screening Matrix
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Technology Group	Technology Options	Protect Human Health and the Environment	Comply with Cleanup Standards	Comply with Applicable Local, State and Federal Laws	Provide for Compliance Monitoring	Use Permanent Solutions to the Maximum Extent Practicable	Reasonable Restoration Time Frame	Considers Public Concerns	Retained Alternative for Further Evaluation	Comments
		Threshold Criteria(WAC 173-340-360 [2][a])				Modifying Criteria (WAC 173-340-360 [2][b])				
***In-Situ* Chemical Oxidation**										
	Sodium Persulfate	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
	Heated Sodium Persulfate	X	X	X	√	√	X	√	No	Not applicable to vadose zone
	Hydrogen Peroxide	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
	Permanganate	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
	RegenOx (Catalyzed Sodium Percarbonate)	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
	Fenton's Reagent	X	X	X	√	√	X	√	No	Not applicable to vadose zone
	Activated Iron Wall	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
Containment / Immobilization										
	Bituminization	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Emulsified Asphalt	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Modified Sulfur Cement	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Polyethylene Extrusion	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Pozzolan/Portland Cement	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Vitrification/Molten Glass	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Slurry Wall Containment	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
Phytoremediation										
	Hydraulic Control	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Degradation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Volatilization	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Accumulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Stabilization	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Enhanced Rhizosphere Biodegradation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
***In-Situ* Bioremediation**										
	Aerobic Bio-Augmentation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Aerobic Bio-Stimulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Anaerobic Bio-Augmentation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Anaerobic Bio-Stimulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Nitrate-Enhanced Bioremediation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Sulfate-Enhanced Bioremediation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
Capping										
	Containment Cap	√	√	√	√	X	√	√	Yes	

NOTES:

In order for the option to pass the screening, all threshold criteria must be met.

X	Does not meet criterion
√	Does meet criterion

PAH = polycyclic aromatic hydrocarbons

PRB = permeable reactive barrier

WAC = Washington Administrative Code

Table 7c
Area C
Alternative Screening Matrix
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Technology Group	Technology Options	Protect Human Health and the Environment	Comply with Cleanup Standards	Comply with Applicable Local, State and Federal Laws	Provide for Compliance Monitoring	Use Permanent Solutions to the Maximum Extent Practicable	Reasonable Restoration Time Frame	Considers Public Concerns	Retained Alternative for Further Evaluation	Comments
		Threshold Criteria(WAC 173-340-360 [2][a])				Modifying Criteria (WAC 173-340-360 [2][b])				
Passive Remediation										
	No Further Action	X	X	X	X	X	X	√	No	Not protective of human health and the environment.
	Monitored Natural Attenuation	X	X	X	√	X	X	√	No	Not protective of human health and the environment.
	Passive Treatment Wall (Activated Carbon/PRB)	X	√	√	√	X	X	√	No	Not protective of human health and the environment.
***In-Situ* Physical Treatment**										
	Vapor Extraction (VE)	X	X	X	X	X	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
	Air Sparging	X	X	X	X	X	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
	Air Sparging with VE	X	X	X	X	X	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
	Bioslurping	X	X	X	X	X	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Surfactant Washing	√	√	√	√	X	X	√	No	Would not meet cleanup standards within a reasonable time frame and incompatible with utilities.
	Cosolvent Washing	√	√	√	√	X	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Pump and Treat	√	√	√	√	X	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Dual-Phase Extraction	X	X	X	X	X	X	√	No	Contamination is not volatile enough at *in-situ* temperatures.
Thermal										
	Resistive Thermal with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Conductive Thermal with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Radio Frequency/Electromagnetic Thermal with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Steam Injection with VE and Groundwater Extraction	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Hot Air Injection with VE	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Hot Water Injection with VE and Groundwater Extraction	√	√	√	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
Source Removal										
	Excavation without shoring	X	X	X	√	X	X	√	No	Contamination left in slope-back not protective of human health and the environment.
	Excavation with shoring	√	√	√	√	X	√	√	Yes	
Source Removal Treatment										
	Surfactant Washing	√	√	√	√	X	√	√	Yes	Only retained if excavation is selected.
	Cosolvent Washing	X	√	√	√	X	X	√	No	Not applicable to metal contamination.
	Chemical Oxidation	X	√	√	√	√	X	√	No	Not applicable to metal contamination.
	Landfill Disposal	√	√	√	√	X	√	√	Yes	Only retained if excavation is selected.

NOTES:

In order for the option to pass the screening, all threshold criteria must be met.

X Does not meet criterion

√ Does meet criterion

PAH = polycyclic aromatic hydrocarbons

PRB = permeable reactive barrier

WAC = Washington Adminsitrative Code

Table 7c
Area C
Alternative Screening Matrix
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Technology Group	Technology Options	Protect Human Health and the Environment	Comply with Cleanup Standards	Comply with Applicable Local, State and Federal Laws	Provide for Compliance Monitoring	Use Permanent Solutions to the Maximum Extent Practicable	Reasonable Restoration Time Frame	Considers Public Concerns	Retained Alternative for Further Evaluation	Comments
		Threshold Criteria(WAC 173-340-360 [2][a])				Modifying Criteria (WAC 173-340-360 [2][b])				
***In-Situ* Chemical Oxidation**										
	Sodium Persulfate	X	X	X	√	X	X	√	No	Not applicable to PAH contamination.
	Heated Sodium Persulfate	X	X	X	√	X	X	√	No	Not applicable to vadose zone
	Hydrogen Peroxide	X	X	X	√	X	X	√	No	Not applicable to PAH contamination.
	Permanganate	X	X	X	√	X	X	√	No	Not applicable to PAH contamination.
	RegenOx (Catalyzed Sodium Percarbonate)	X	X	X	√	X	X	√	No	Not applicable to PAH contamination.
	Fenton's Reagent	X	X	X	√	X	X	√	No	Not applicable to vadose zone
	Activated Iron Wall	X	X	X	√	√	X	√	No	Not applicable to PAH contamination.
Containment / Immobilization										
	Bituminization	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Emulsified Asphalt	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Modified Sulfur Cement	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Polyethylene Extrusion	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Pozzolan/Portland Cement	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Vitrification/Molten Glass	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
	Slurry Wall Containment	X	√	√	√	X	√	√	No	Does not remove contamination/Is not compatible with site development utilities.
Phytoremediation										
	Hydraulic Control	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Degradation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Volatilization	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Accumulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Phyto-Stabilization	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Enhanced Rhizosphere Biodegradation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
***In-Situ* Bioremediation**										
	Aerobic Bio-Augmentation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Aerobic Bio-Stimulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Anaerobic Bio-Augmentation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Anaerobic Bio-Stimulation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Nitrate-Enhanced Bioremediation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
	Sulfate-Enhanced Bioremediation	X	X	X	√	√	X	√	No	Would not meet cleanup standards within a reasonable time frame.
Capping										
	Containment Cap	√	√	√	√	X	√	√	Yes	

NOTES:

In order for the option to pass the screening, all threshold criteria must be met.

X = Does not meet criterion
√ = Does meet criterion

PAH = polycyclic aromatic hydrocarbons

PRB = permeable reactive barrier

WAC = Washington Adminsitrative Code

Table 8a
Area A
Remedial Alternatives Screening Summary
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

		Washington State Department of Ecology Evaluation Criteria / Relative Ranking (1 - High/Preferred, 5- Low/Problematic)								
Remedial Alternatives	**Remedial Details**	**Protectiveness**	**Permanence**	**Cost**	**Effectiveness over the Long Term**	**Management of Short-Term Risks**	**Technical and Administrative Implementability**	**Consideration of Public Concerns**	**Ranking Tally**	**Comments / Issues / Concerns**
1a- Impervious wall shoring, excavation of source area, and direct discharge of groundwater from the building sub-grade groundwater intrusion control system	Remove all chemicals of concern within shoring limits and block water intrusion.	1	1	2	1	3	1	1	**10**	**Favorable**
2a- Pervious wall shoring, excavation of source area, and installation of permeable reactive barrier to treat building sub-grade groundwater intrusion control system	Remove all chemicals of concern within shoring limits and passively treat water intrusion.	1	1	3	3	3	1	1	**13**	**Unfavorable:** The risk associated with the permeable reactive barrier and the costs associated with the installation make Alternative 2a less favorable than Alternatives 1a and 3a.
3a- Pervious wall shoring, excavation of source area, and installation of permanent arsenic treatment system to treat building sub-grade groundwater intrusion control system	Remove all chemicals of concern within shoring limits and actively treat water intrusion.	1	1	3	2	3	1	1	**12**	**Average:** The increased costs associated with the permanent groundwater treatment system make Alternative 3a less favorable than Alternernative 1a.

NOTES:

High - method is proven in field as standard approach with Washington State Department of Ecology approval as reliable

Medium - method has acceptable results with certain conditions

Low - method is not proven applicable or is not favorable in field

Table 8b
Area B
Remedial Alternatives Screening Summary
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Remedial Alternatives	Remedial Details	Washington State Department of Ecology Evaluation Criteria / Relative Ranking (1 - High/Preferred, 5- Low/Problematic)								Comments / Issues / Concerns
		Protectiveness	Permanence	Cost	Effectiveness over the Long Term	Management of Short-Term Risks	Technical and Administrative Implementability	Consideration of Public Concerns	Ranking Tally	
1b- Shored excavation with off-Property disposal	Remove all chemicals of concern associated with Site.	1	1	5	1	5	4	4	**21**	**Unfavorable:** The cost is disproportionate to the reduction of risk associated with a relatively stable, non-volatile, and non-soluble contaminant.
2b- Capping of the contaminated soil with excavation and off-Property disposal for contaminated soil generated during utility installation.	Remove the only active pathway, direct contact.	2	3	1	2	1	1	2	**11**	**Favorable**

NOTES:

High - method is proven in field as standard approach with Washington State Department of Ecology approval as reliable

Medium - method has acceptable results with certain conditions

Low - method is not proven applicable or is not favorable in field

Table 8c
Area C
Remedial Alternatives Screening Summary
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Remedial Alternatives	Remedial Details	Washington State Department of Ecology Evaluation Criteria / Relative Ranking (1 - High/Preferred, 5- Low/Problematic)								Comments / Issues / Concerns
		Protectiveness	Permanence	Cost	Effectiveness over the Long Term	Management of Short-Term Risks	Technical and Administrative Implementability	Consideration of Public Concerns	Ranking Tally	
1b- Shored excavation with off-Property disposal	Remove all chemicals of concern associated with site.	1	1	5	1	5	4	4	**21**	**Unfavorable:** The cost is disproportionate to the reduction of risk associated with a relatively stable, non-volatile, and non-soluble contaminant.
2b- Capping of the contaminated soil with excavation and off-Property disposal of contaminated soil generated during utility installation.	Remove the only active pathway, direct contact.	2	3	1	2	1	1	2	**11**	**Favorable**

NOTES:

High - method is proven in field as standard approach with Washington State Department of Ecology approval as reliable

Medium - method has acceptable results with certain conditions

Low - method is not proven applicable or is not favorable in field

SOUND ENVIRONMENTAL STRATEGIES
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Table 9a
Feasibility Study Cost Estimate - Alternative 1a
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	1	lump sum	$2,500	$2,500	
			Subtotal	$2,500	
Site Work					
Environmental Health and Safety Plan Incremental Costs	1	lump sum	$20,000	$20,000	
Incremental Increase in Soil Handling Costs	27,300	tons	$3	$81,900	
Confirmation Sampling Lab Fees	1	lump sum	$8,000	$8,000	
Incremental Increase in Transportation Fees	27,300	tons	$5	$136,500	
Disposal Subtitle D Landfill Tip Fee	27,300	tons	$45	$1,228,500	
			Subtotal	$1,474,900	
CONSTRUCTION SUBTOTAL					$1,477,000
Indirect Capital Costs					
Engineering construction services (10% of construction total)				$147,700	
			Subtotal	$147,700	
TOTAL LOW COST					$1,624,700
Contingencies					
Bid (20% of construction subtotal)				$324,940	
Scope (30% of construction subtotal)				$487,410	
			Subtotal	$812,350	
TOTAL HIGH COST					$2,437,000

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Table 9b
Feasibility Study Cost Estimate - Alternative 2a
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	1	lump sum	$2,500	$2,500	
			Subtotal	$2,500	
Site Work					
Environmental Health and Safety Plan Incremental Costs	1	lump sum	$20,000	$20,000	
Incremental Increase in Soil Handling Costs	27,300	tons	$3	$81,900	
Confirmation Sampling Lab Fees	1	lump sum	$8,000	$8,000	
Incremental Increase in Transportation Fee	27,300	tons	$5	$136,500	
Disposal Subtitle D Landfill Tip Fee	27,300	tons	$45	$1,228,500	
Zero-Valent Iron Permeable Reactive Barrier Installation	1	lump sum	$50,000	$50,000	
Zero-Valent Iron Material	1,200	tons	$750	$900,000	
			Subtotal	$2,424,900	
CONSTRUCTION SUBTOTAL					$2,427,000
Indirect Capital Costs					
Engineering construction services (10% of construction total)				$242,700	
			Subtotal	$242,700	
TOTAL LOW COST					$2,669,700
Contingencies					
Bid (10% of construction subtotal)				$266,970	
Scope (15% of construction subtotal)				$400,455	
			Subtotal	$667,425	
TOTAL HIGH COST					$3,337,000

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Table 9c
Feasibility Study Cost Estimate - Alternative 3a
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	1	lump sum	$2,500	$2,500	
			Subtotal	$2,500	
Site Work					
Environmental Health and Safety Plan Incremental Costs	1	lump sum	$20,000	$20,000	
Incremental Increase in Soil Handling Costs	27,300	tons	$3	$81,900	
Confirmation Sampling Lab Fees	1	lump sum	$8,000	$8,000	
Incremental Increase in Transportation Fee	27,300	tons	$5	$136,500	
Disposal Subtitle D Landfill Tip Fee	27,300	tons	$45	$1,228,500	
Zero-Valent Iron Filter System Installation	1	lump sum	$150,000	$150,000	
Zero-Valent Iron Material	4	tons	$750	$3,000	
			Subtotal	$1,627,900	

COST ITEM	ANNUAL COST[1]	Present Worth Cost of Annual O&M		
		(7% - 2%)	5%	
OPERATION & MAINTENANCE COST			50 Years	
Annual treatment system O&M	$25,000		$456,398	
Quarterly Performance Monitoring (yearly cost)	$10,000		$182,559	
Annual Reporting	$5,000		$91,280	
TOTAL PRESENT WORTH O & M COST			$730,237	
CONSTRUCTION SUBTOTAL				$2,361,000
Indirect Capital Costs				
Engineering construction services (15% of construction total)			$354,150	
		Subtotal	$354,150	
TOTAL LOW COST				$2,715,150
Contingencies				
Bid (20% of construction subtotal)			$271,515	
Scope (30% of construction subtotal)			$407,273	
		Subtotal	$678,788	
TOTAL HIGH COST				$3,394,000

Table 9d
Feasibility Study Cost Estimate - Alternative 1b
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	0	lump sum	$2,500	$0	
			Subtotal	$0	
Site Work					
On-Property					
Shoring - exposed face	13,500	square feet	$90	$1,215,000	
Excavation Cost	8,000	tons	$4	$32,000	
Confirmation Sampling Lab Fees	1	lump sum	$5,000	$5,000	
Transportation Fee	8,000	tons	$10	$80,000	
Disposal Subtitle D Landfill Tip Fee	8,000	tons	$45	$360,000	
			Subtotal	$1,692,000	
CONSTRUCTION SUBTOTAL					$1,692,000
Indirect Capital Costs					
Engineering construction services (10% of construction total)				$169,200	
			Subtotal	$169,200	
TOTAL LOW COST					$1,861,200
Contingencies					
Bid (10% of construction subtotal)				$186,120	
Scope (10% of construction subtotal)				$186,120	
			Subtotal	$372,240	
TOTAL HIGH COST					$2,233,000

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Table 9e
Feasibility Study Cost Estimate - Alternative 2b
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	1	lump sum	$2,500	$2,500	
			Subtotal	$2,500	
Site Work					
On-Property					
Excavation Cost	300	tons	$4	$1,200	
Transportation Fee	300	tons	$10	$3,000	
Disposal Subtitle D Landfill Tip Fee	300	tons	$45	$13,500	
			Subtotal	$17,700	
CONSTRUCTION SUBTOTAL					$20,000
Indirect Capital Costs					
Engineering construction services (10% of construction total)				$2,000	
			Subtotal	$2,000	
TOTAL LOW COST					$22,000
Contingencies					
Bid (50% of construction subtotal)				$11,000	
Scope (50% of construction subtotal)				$11,000	
			Subtotal	$22,000	
TOTAL HIGH COST					$44,000

Table 9f
Feasibility Study Cost Estimate - Alternative 1c
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	0	lump sum	$2,500	$0	
			Subtotal	$0	
Site Work					
Permitting (includes street closure, Seattle Department of Transportation, Seattle Public Utilities, Master Use Permit, State Environmental Policy Act, and grading permits)	1	lump sum	$50,000	$50,000	
Demolition (street, sidewalk, and shoring)	1	lump sum	$30,000	$30,000	
Shoring - exposed face	1,500	square feet	$90	$135,000	
Excavation cost (includes shoring removal)	800	tons	$4	$3,200	
Confirmation sampling lab fees	1	lump sum	$2,000	$2,000	
Transportation fee	800	tons	$10	$8,000	
Disposal (uncontaminated fill material)	750	tons	$20	$15,000	
Disposal Subtitle D Landfill Tip Fee	50	tons	$45	$2,250	
Backfill (controlled-density fill required)	600	cubic yards	$116	$69,600	
Street/sidewalk reconstruction	1	lump sum	$30,000	$30,000	
Utility Shoring/Replacement	1	lump sum	$400,000	$400,000	
			Subtotal	$665,050	
CONSTRUCTION SUBTOTAL					$665,000
Indirect Capital Costs					
Engineering construction services (10% of construction total)				$66,500	
			Subtotal	$66,500	
TOTAL LOW COST					$731,500
Contingencies					
Bid (10% of construction subtotal)				$73,150	
Scope (10% of construction subtotal)				$73,150	
			Subtotal	$146,300	
TOTAL HIGH COST					$878,000

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Table 9g
Feasibility Study Cost Estimate - Alternative 2c
Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Cost Item	Qty	Unit	Unit Price	Cost	Totals
CAPITAL COST					
Institutional Controls					
Environmental Covenant	1	lump sum	$2,500	$2,500	
			Subtotal	$2,500	
TOTAL COST					$2,500

CHARTS

Chart 1
Cost Comparison
Impermeable vs. Permeable Shoring
Area A

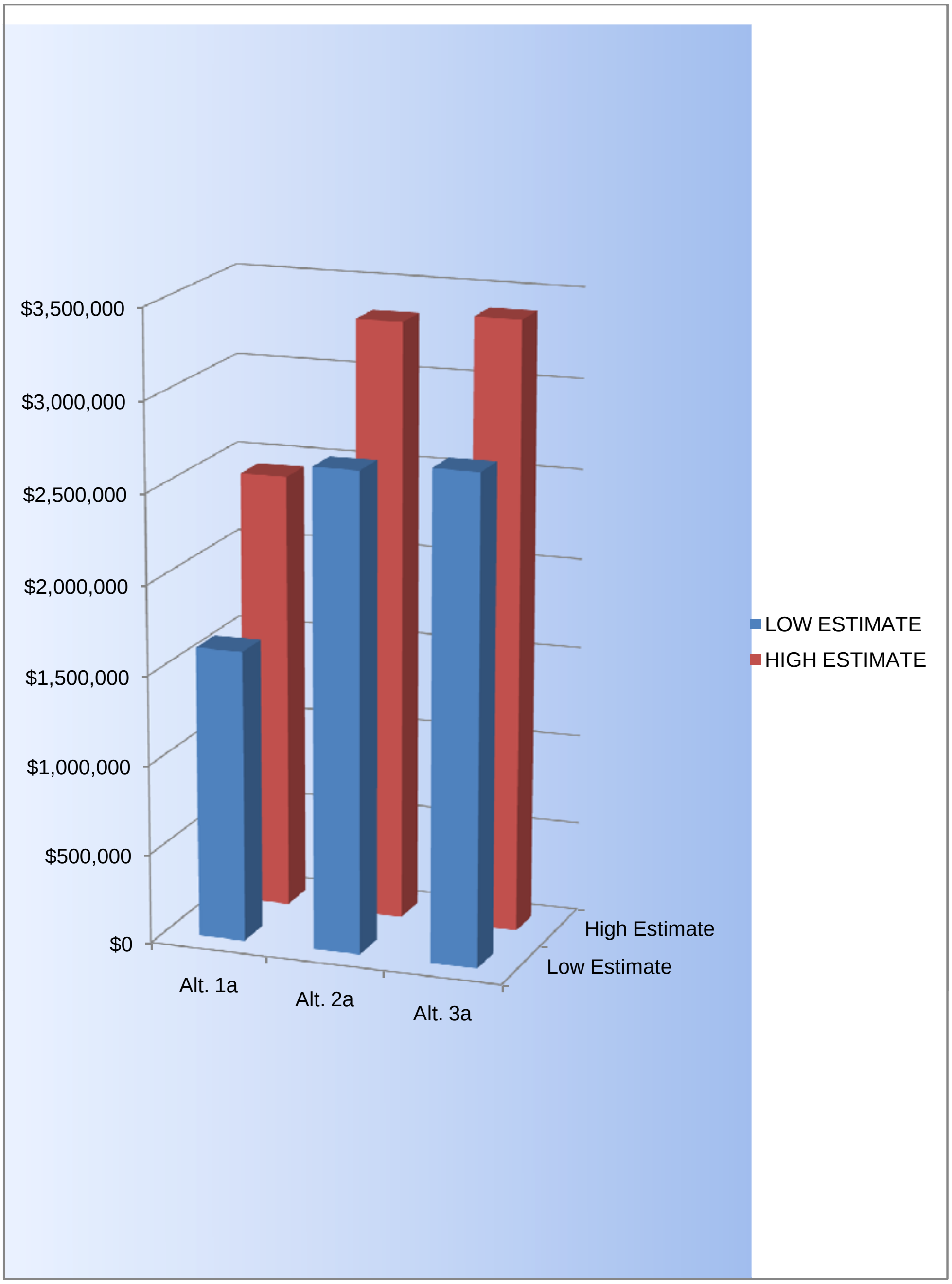
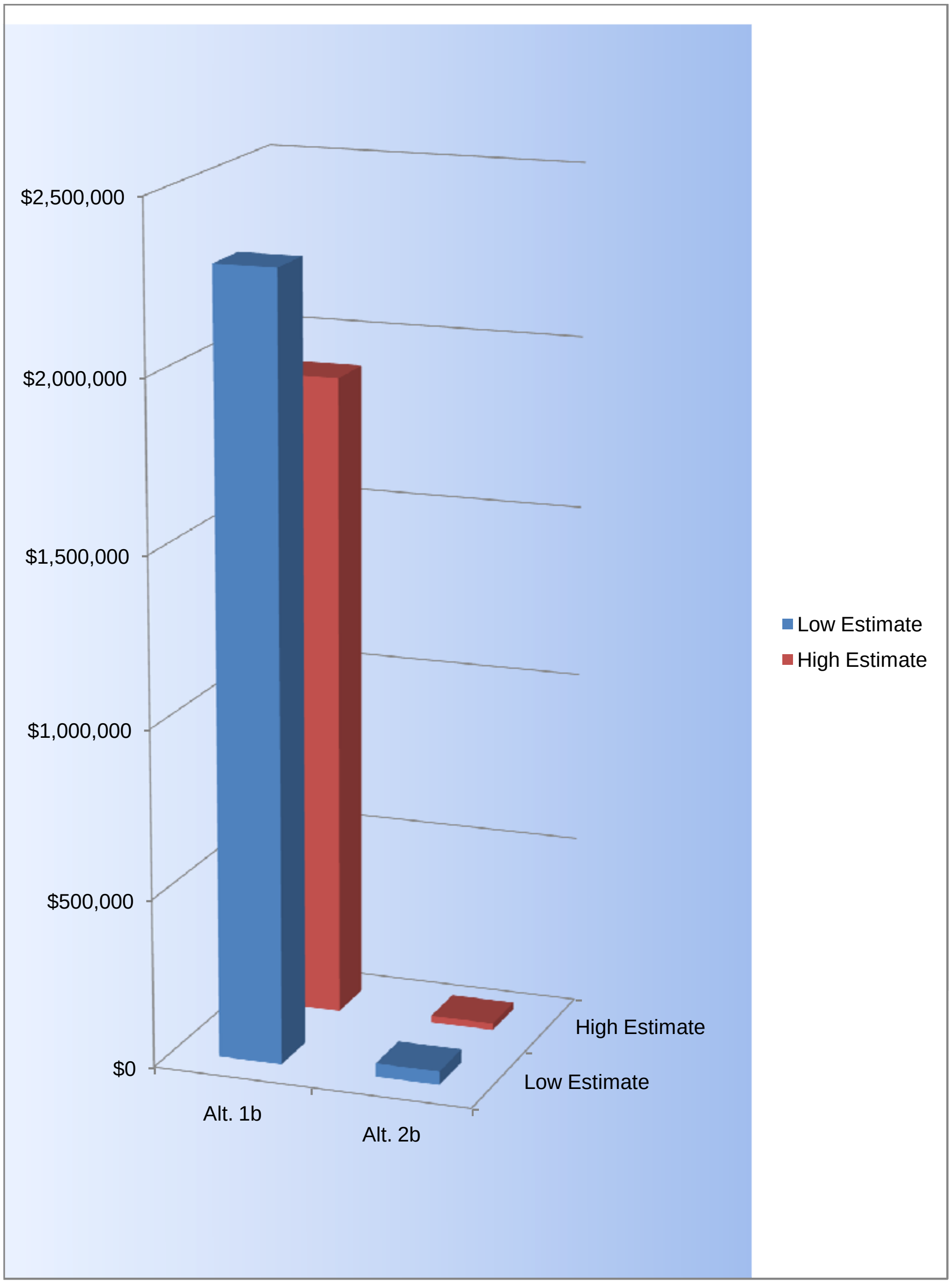
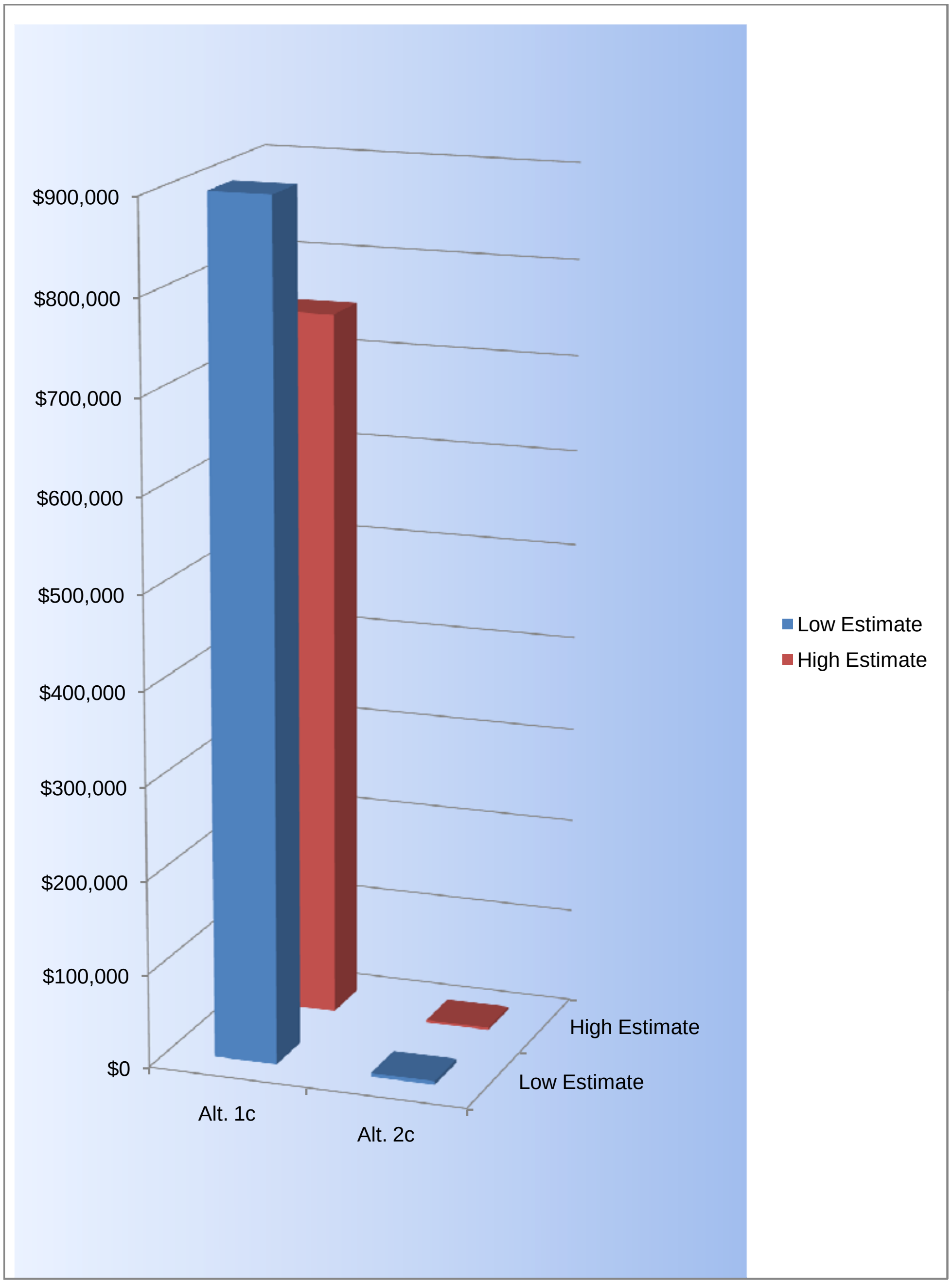


Chart 2
Cost Comparison
Excavation vs. Capping
Area B

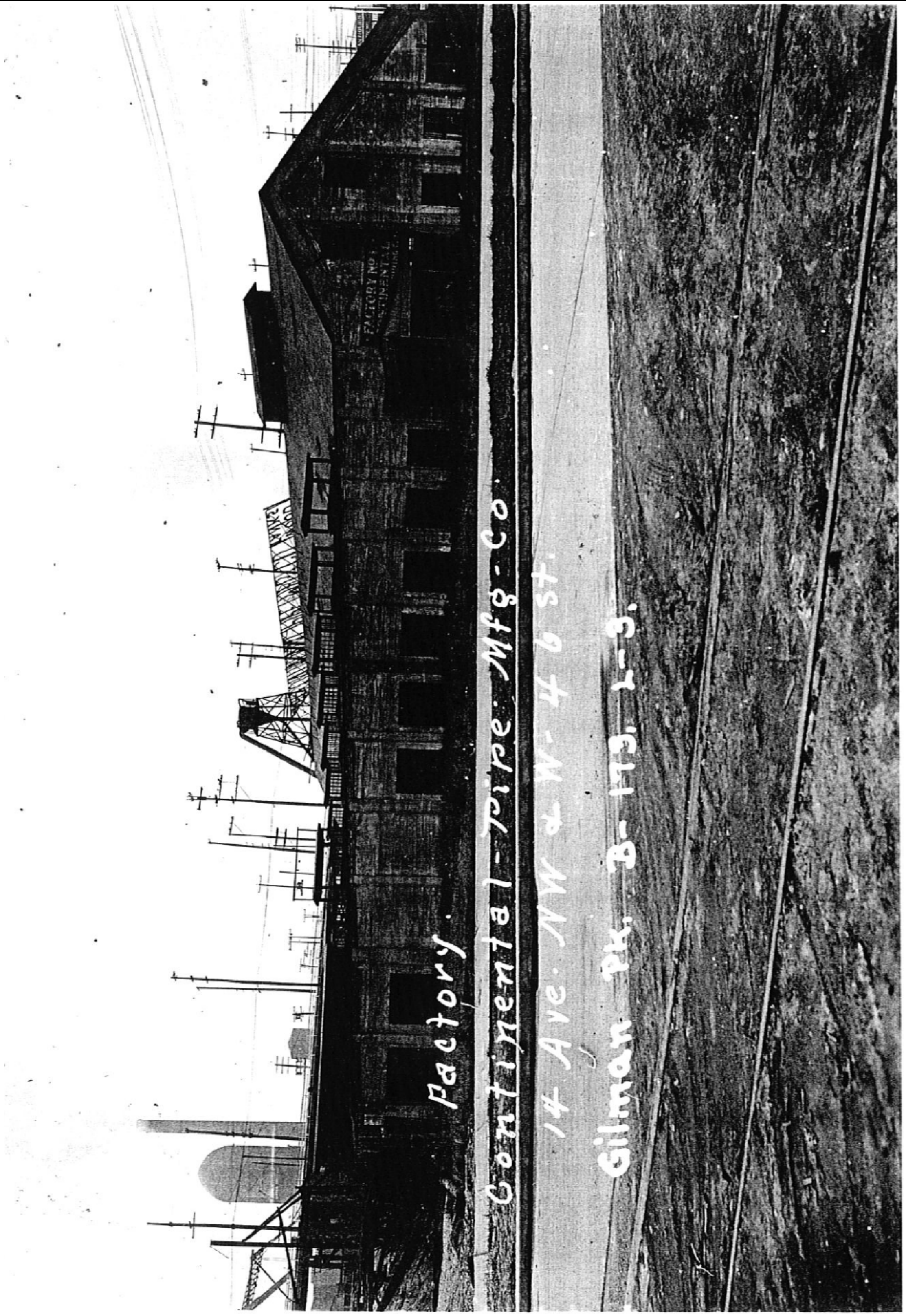


SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Chart 3
Cost Comparison
Excavation vs. Capping
Area C



PHOTOGRAPHS

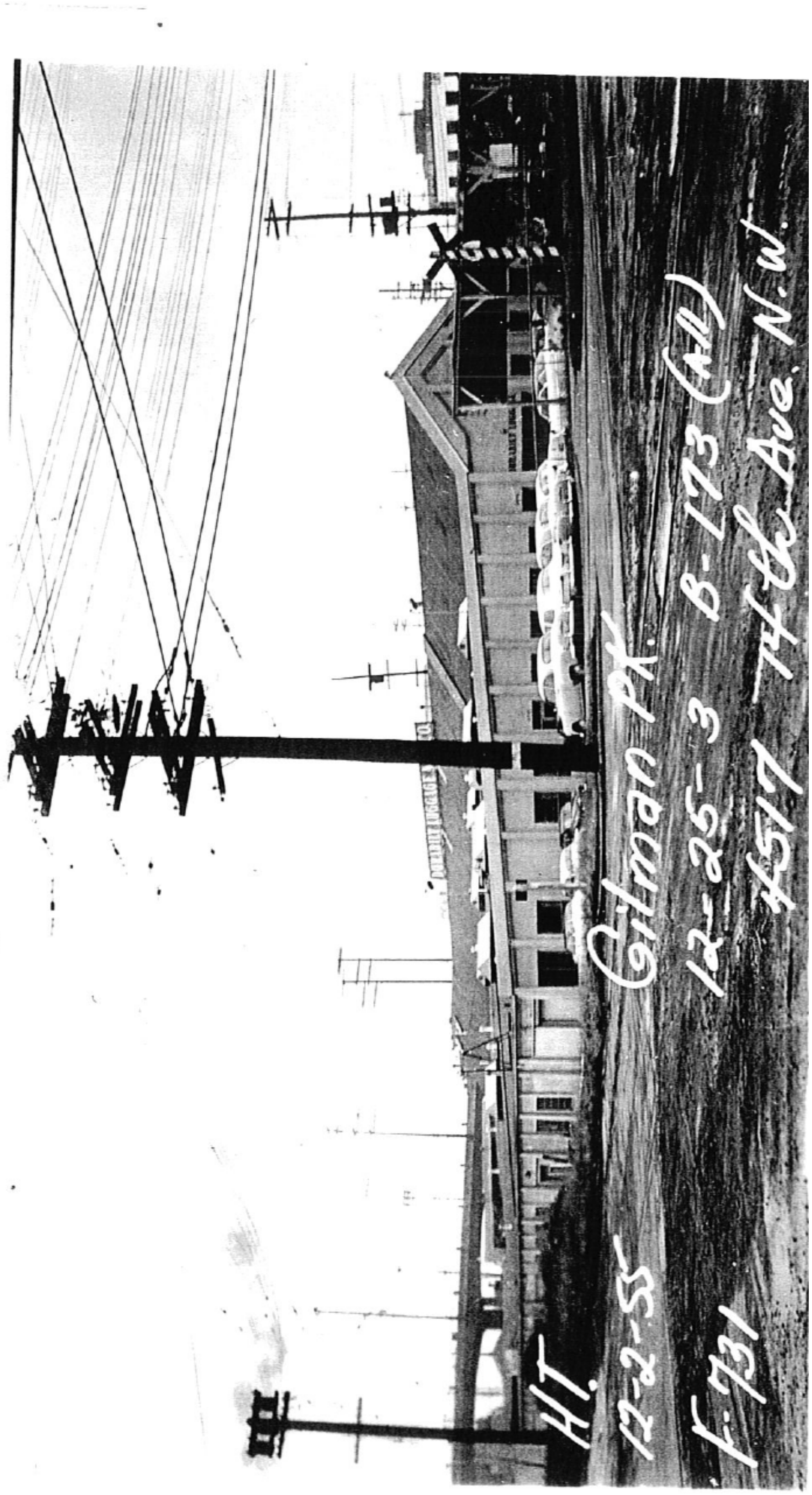


Date: February 6, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 1

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 1

14th Avenue Northwest
& (North)West 46th
Street
(Subject Property)



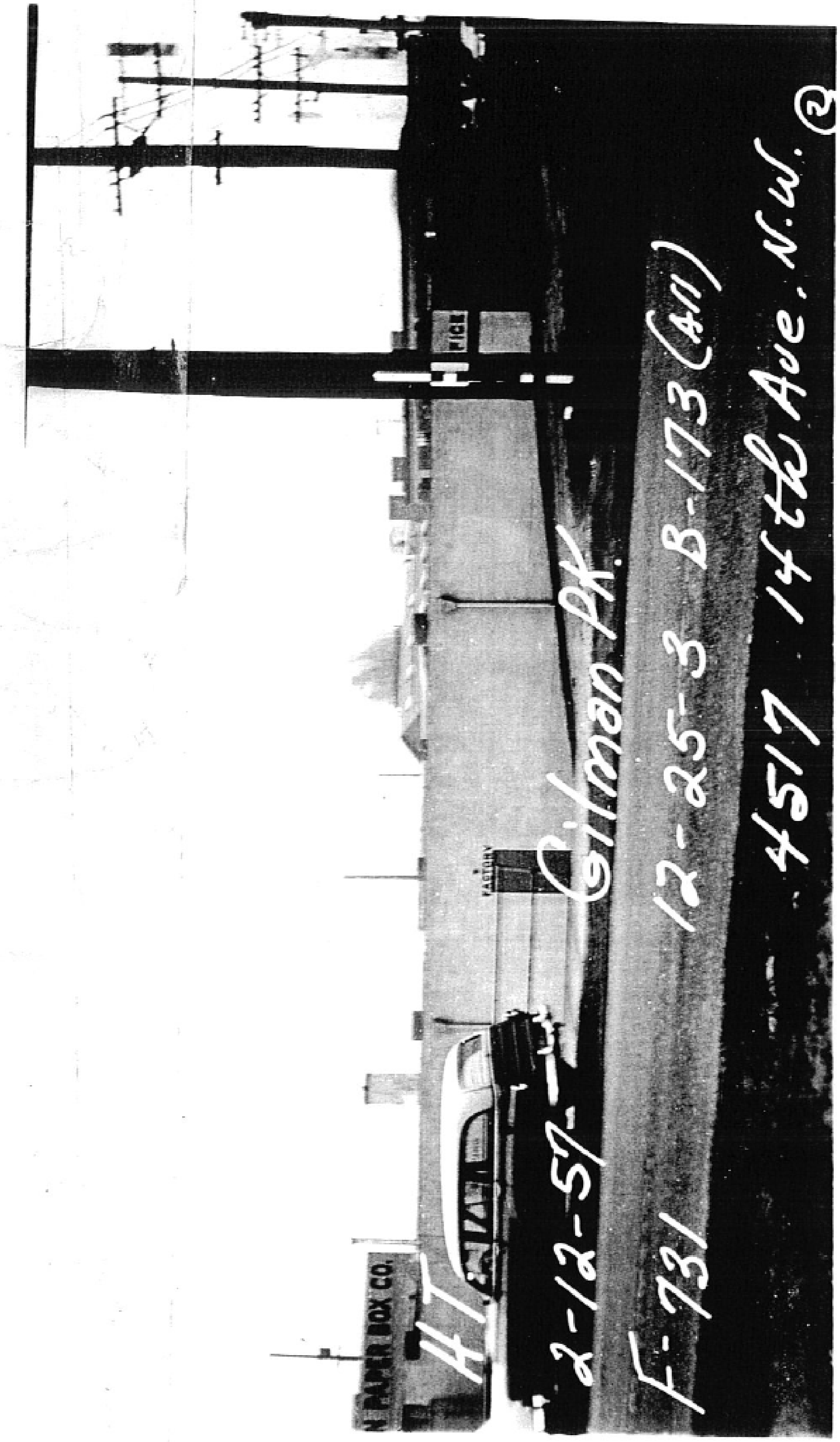
SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 2

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 2

4517 14th Avenue
Northwest
(1955)
(Subject Property)



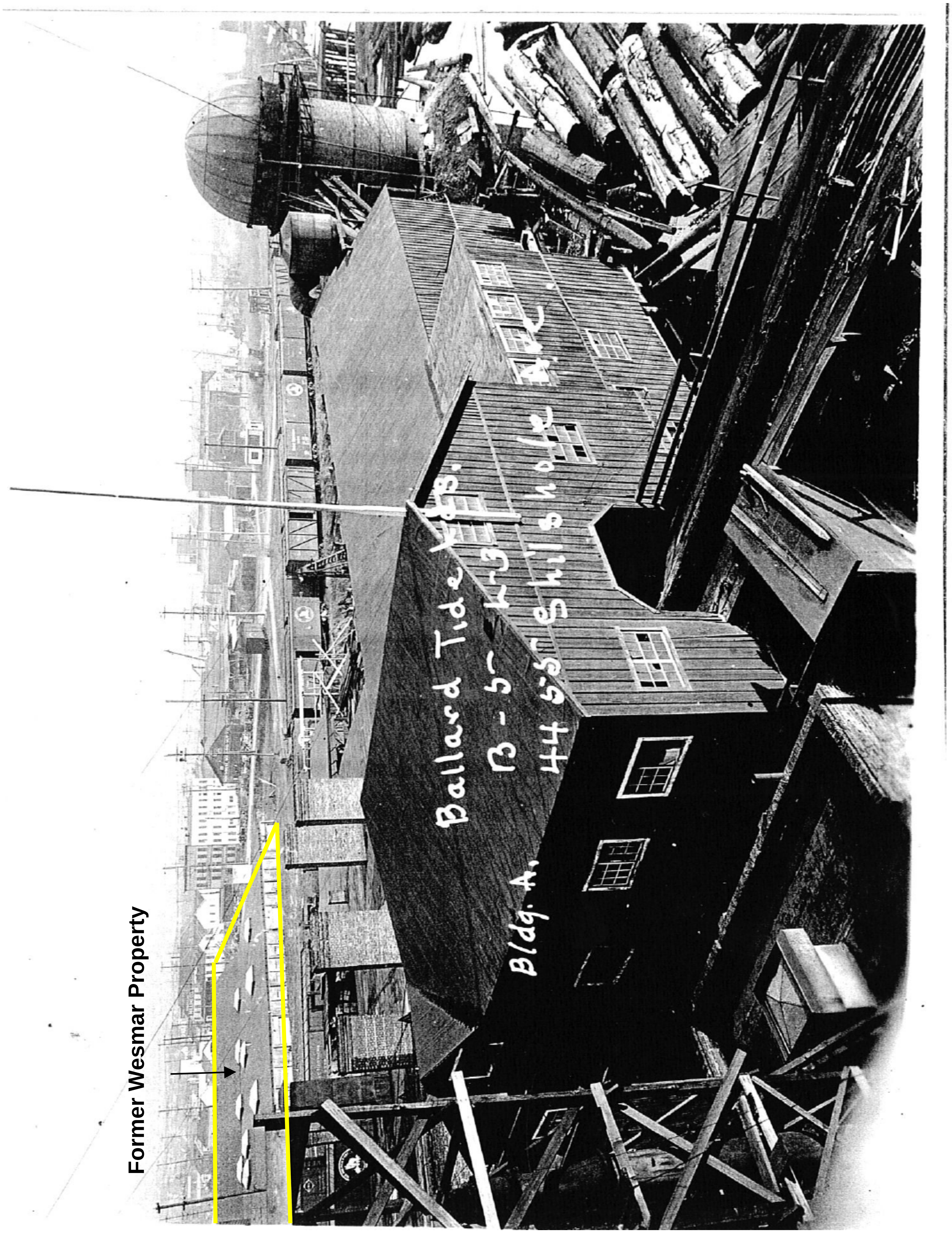
SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 3

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 3

4517 14th Avenue
Northwest
(1957)
(Subject Property)



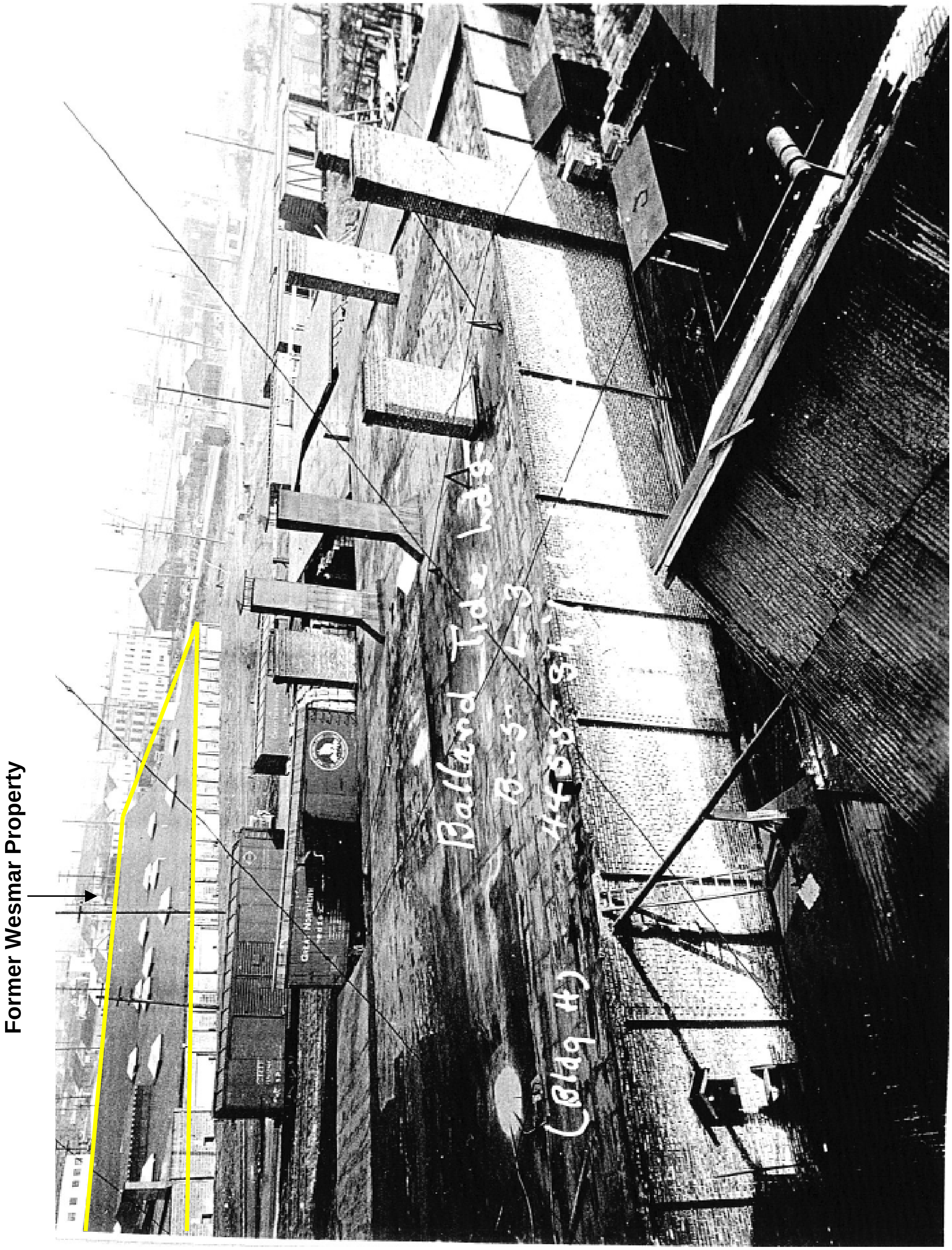
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 4

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 4

4455 Shilshole
Avenue
(Northwest)



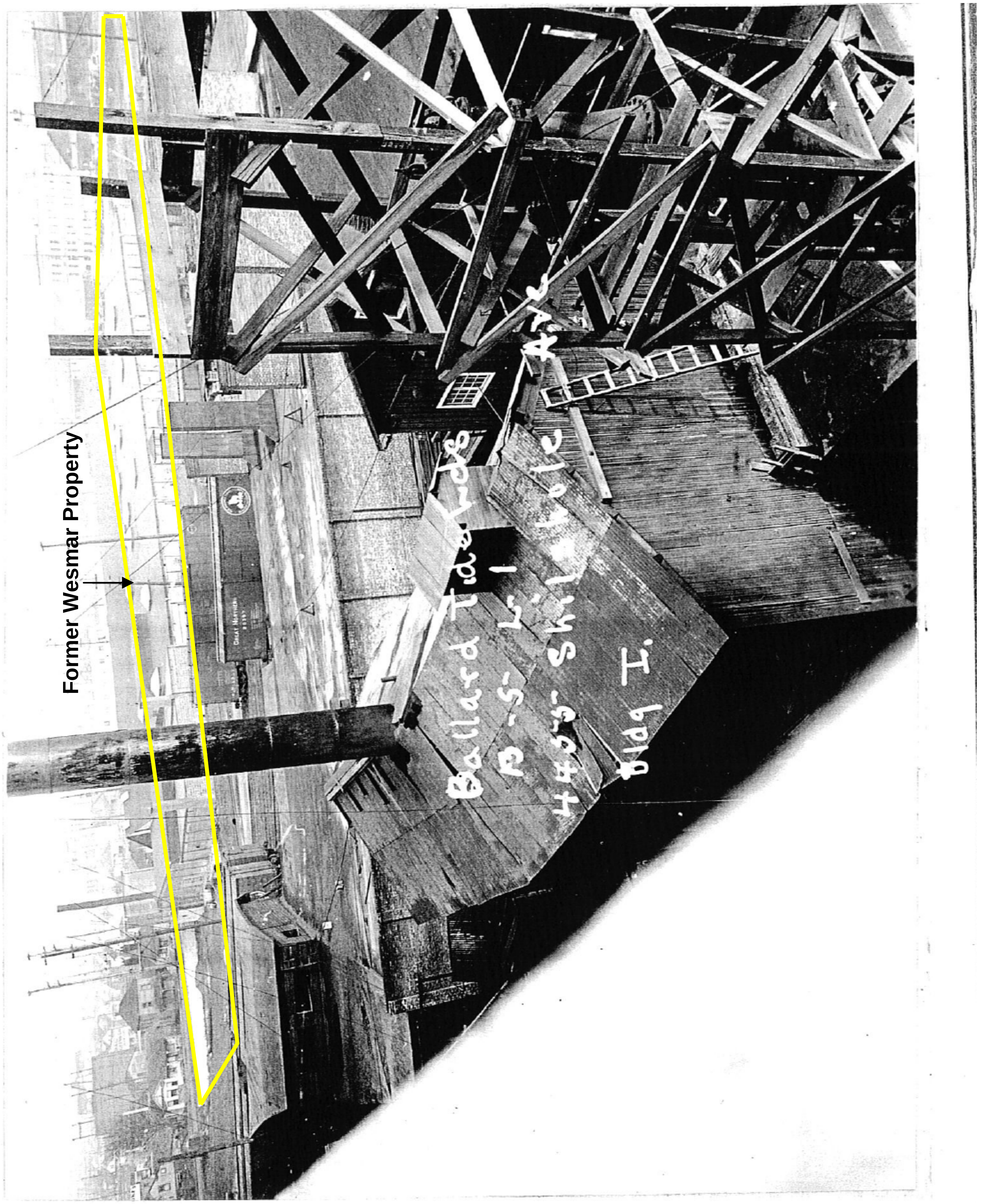
SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 5

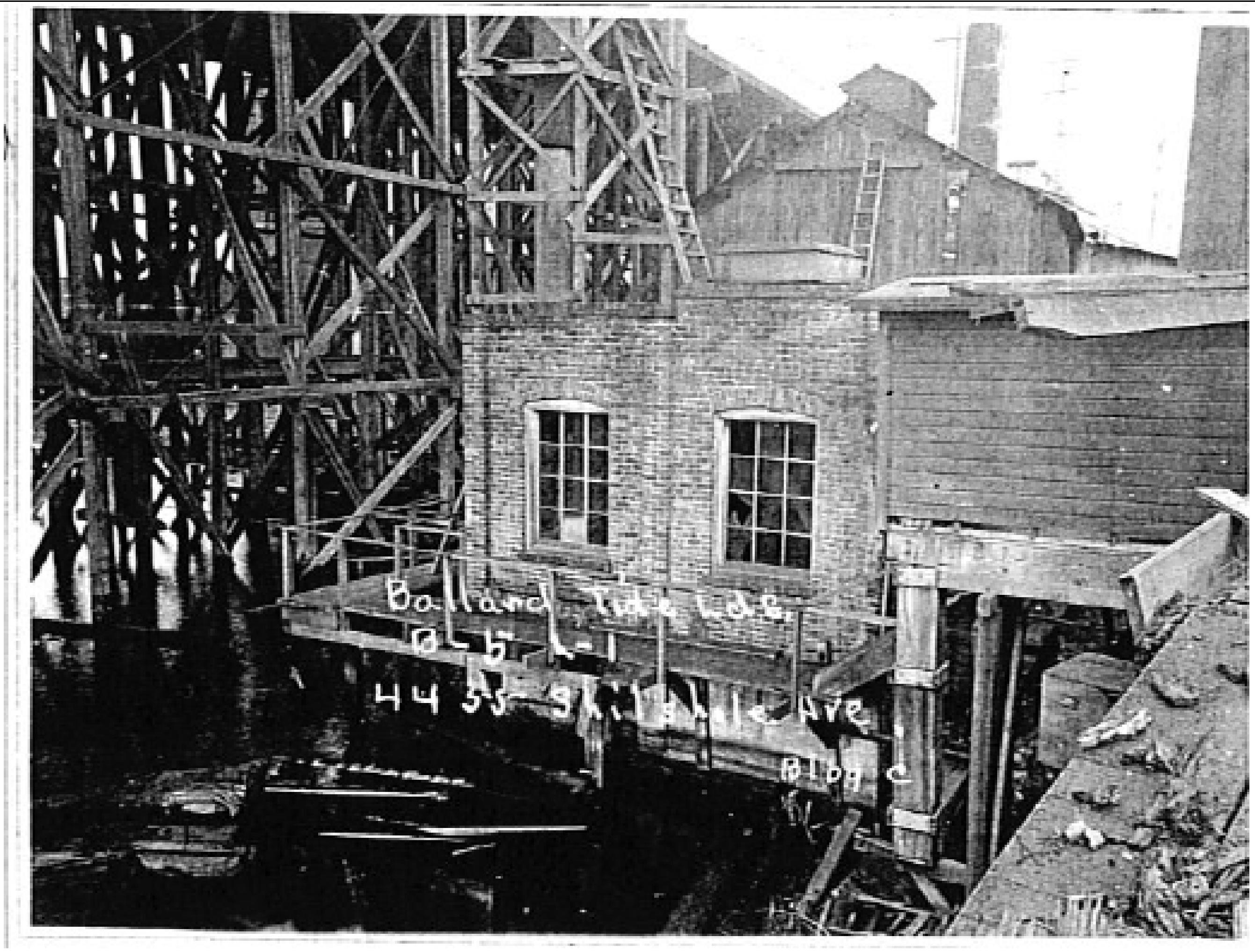
Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 5

4455 Shilshole
Avenue
(Northwest)



SOUND ENVIRONMENTAL STRATEGIES www.soundenvironmental.com	Date: February 8, 2008 Drawn By: A. Dayalu Chk By: E. Rothman SES Project No.: 0398-002 File ID: photo 6	Former Wesmar Property 1401 & 1451 Northwest 46th Street Seattle, Washington	**Photograph 6** 4455 Shilshole Avenue (Northwest)



SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 7

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 7

4455 Shilshole Avenue (Northwest)

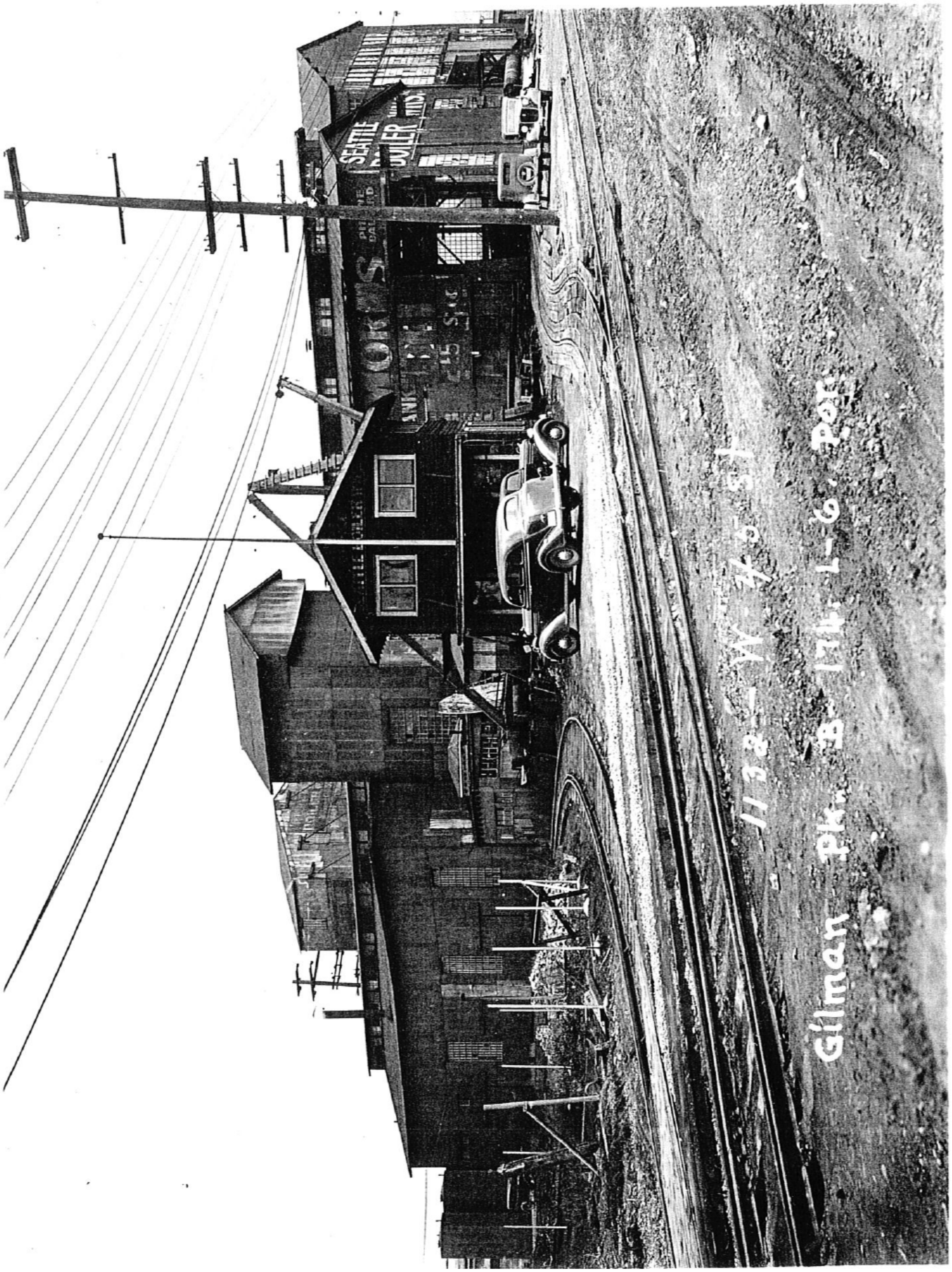
SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 8

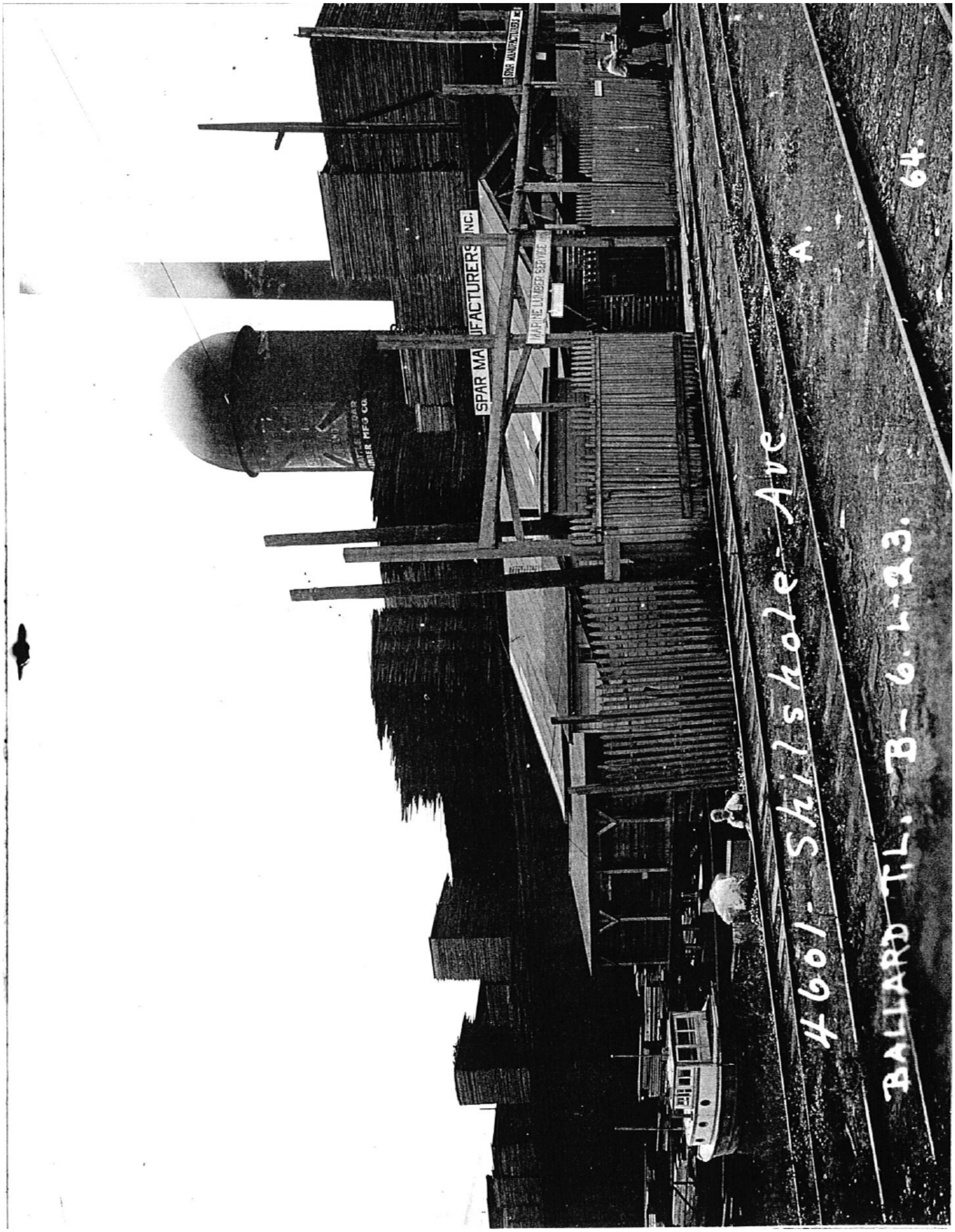
Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 8

4518 14th Avenue
Northwest



Sound Environmental Strategies www.soundenvironmental.com	Date: February 8, 2008 Drawn By: A. Dayalu Chk By: E. Rothman SES Project No.: 0398-002 File ID: photo 9	Former Wesmar Property 1401 & 1451 Northwest 46th Street Seattle, Washington	**Photograph 9** 1132 (North)West 45th Street



SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 10

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 10

4601 Shilshole
Avenue
(Northwest)

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothman
SES Project No.: 0398-002
File ID: photo 11

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 11

4735 Shilshole Avenue (Northwest) (1960)

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothmann
SES Project No.: 0398-002
File ID: photo 12

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 12

46th Avenue
Northwest and
Shilshole Avenue
(Northwest)
(June 24, 1915)

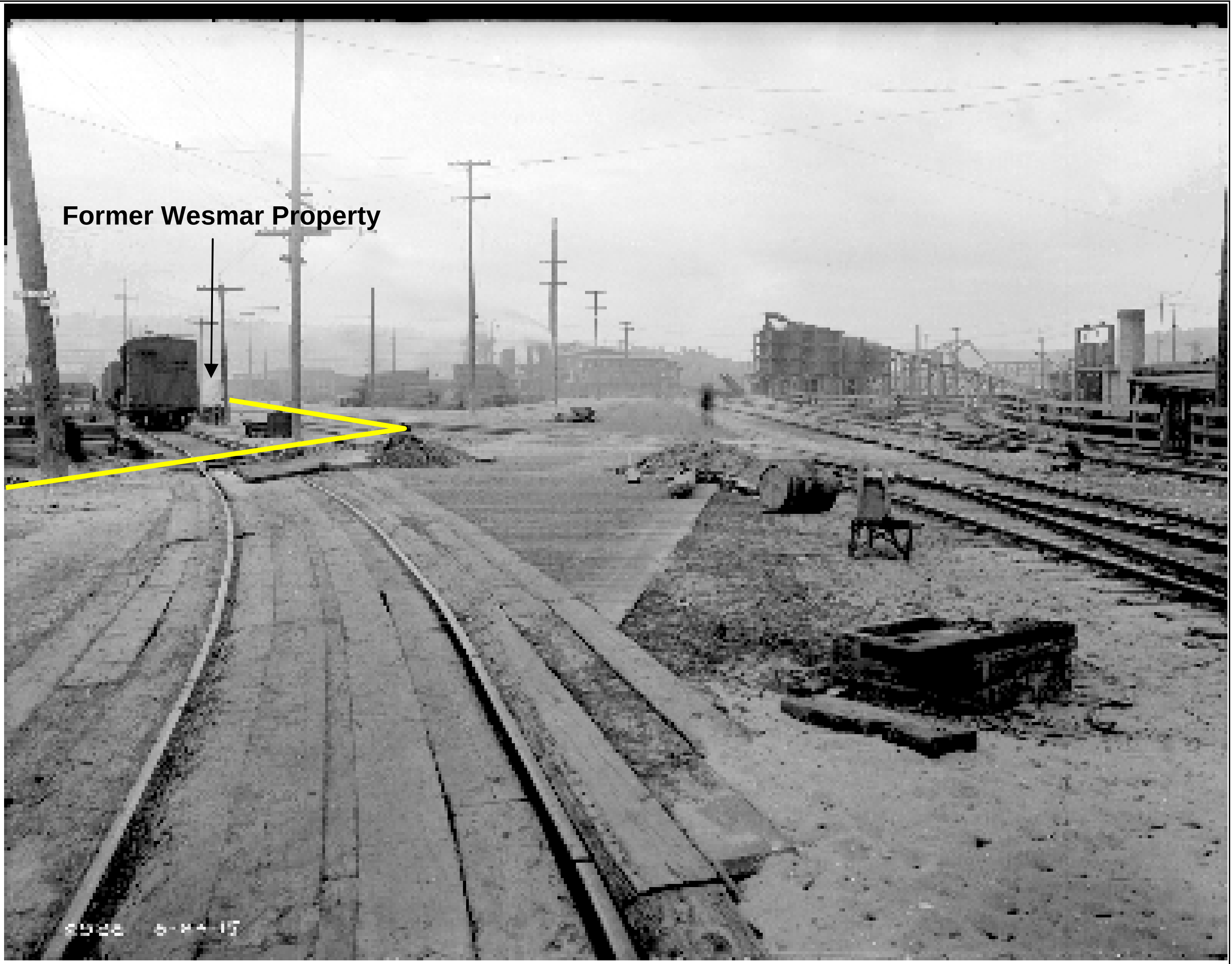
SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothmann
SES Project No.: 0398-002
File ID: photo 13

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 13
15th Avenue Northwest and 45th Street Northwest looking east to southeast
(June 24, 1915)

SOUND ENVIRONMENTAL STRATEGIES www.soundenvironmental.com	Date: February 8, 2008 Drawn By: A. Dayalu Chk By: E. Rothmann SES Project No.: 0398-002 File ID: photo 14	Former Wesmar Property 1401 & 1451 Northwest 46th Street Seattle, Washington	**Photograph 14** 15th Avenue Northwest and Shilshole Avenue Northwest looking south to southeast (June 24, 1915)



SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Date: February 8, 2008
Drawn By: A. Dayalu
Chk By: E. Rothmann
SES Project No.: 0398-002
File ID: photo 15

Former Wesmar Property
1401 & 1451
Northwest 46th Street
Seattle, Washington

Photograph 15

15th Avenue Northwest
and Shilshole Avenue
Northwest looking
southeast
(June 24, 1915)

APPENDIX A

Puget Sound Regional Archives

1 District
Limits
Card
Code No. 2
Permit No.

2 Addition GILMAN PARK   Name 05095 . 3255 3561
Section   Twp.   N. Range   Ewm: Block 173   Tract or Lot No. 5
Description Lots 3 to 8 + N 70' + W 35' of S 30' of 9 + also W 35' of 14 + all of 15 to 20 Inclusive

3 Address — Property W 45th St & 46th & 14th Ave NW   Cont. Purchaser (por of above subj to jt esmt for spur track to G.N.Ry & N.P. Rys as per STC letter of 4/18/41)
4 Fee Owner ~~E. G. S[illegible] 3-10-37~~
5 Architect   Contractor

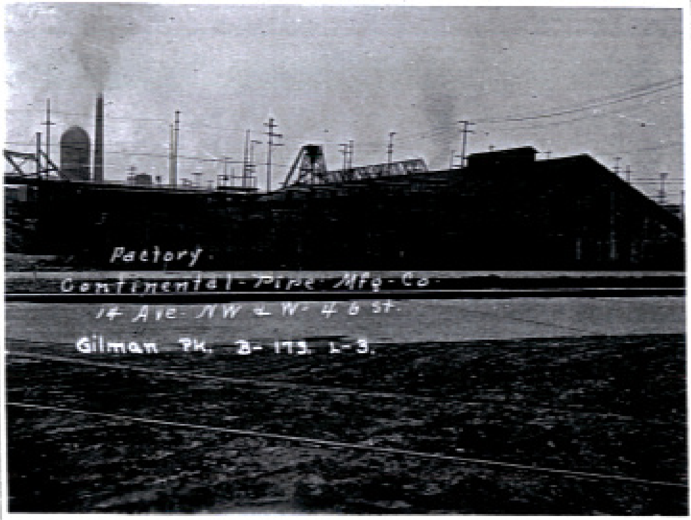
Orig. Cost $
Basement none
Store Fronts no
Extra Features 665 Sprinklers

6 Building
CONC MILL
1 story
9 rooms

Construction Rein. Conc. mill medium
Refrigeration
7 Condition: Exterior fair   Interior good   Found. good
8 Main Support Column x   Footing   Span Ft.
9 First Floor Joist   Inch Center Bridged
10   Building finished
11 Gross Income $ Expense $ Net Income $
12 Depreciation: Cond. 60 %   Obslse. %   Econ. Suit. %   Total %
Year Built 1906   Remodeled 1937
Effective Age 30 Years   Future Life 20 Years
Dimensions 170 x 312 x 8 x 22   Square Ft. 53216   Area Cubic Ft.

Foundation concrete
Exterior Conc Walls rein conc trim
Roof Tar paper

Interior post & beam trosses kind 1 partition
Floors cement
Plumbing 13 fix. 7 toilets 4 sinks 1 urinal 1 h.w.tank cheap
Tile Work
Wiring 300-Elect outlets
Heating steam electric blowers
Elevators
Entrance
Ceilings — Story Height 1st flr 12 to 18' mean roof hgt. 14'



IMPROVEMENT VALUE
Main Building $
Other Buildings $
Total $25440
Assessed Value 50% $12720
Date 11-9-37

LAND INFORMATION
1. Size x
Level On Grade
2. Street — Road Paved Graded
No Alley
3. Sidewalk Conc.
Sewer
4. Landscaping None
5. Trend Static   Land Value $
6. Use Indus.
No View
7. District Med. Old

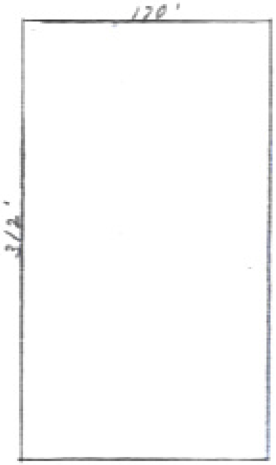
Owner or Contract Purchaser	Date	File No.	Price	Mtge.	Stamp
R. D. Bonde Co.					

Remarks Being Remodeled See 1938 Appraisal

Also - $\frac{4-5-6-7-8}{173}$ Also N-70' of $\frac{10}{173}$ + N.70' of $\frac{11}{173}$ Also W-35' of $\frac{14}{173}$ Also - $\frac{15-16-17}{173}$ + $\frac{18-19-20}{173}$ Gilman Park

Pink Slip Checked No Change.
1945 - Built 5 - 14x24 sheds for Temp Sleeping quarters.

FLOOR PLAN



Commercial, Factory, Loft, Garage — King County Assessor, Seattle, Washington

DISTRICT	ROAD	SCHOOL	WATER	FIRE
5-46- 58,890				

DECREASE OR INCREASE IN ASSESSED VALUATION

RECORD OF ASSESSED VALUE								LAND		BUILDING	
YEAR	AC.	LAND	BLDGS.	TOTAL	DATE	BY	REASON	DECREASE	INCREASE	DECREASE	INCREASE
1938		350	12720	13076							
1946		5130	12720	17850	11-44		merge				
1946		5110	12720	17830	5/45	McD					
1947		5110	20000	25110	4-46	mao					
19											
19											
19											
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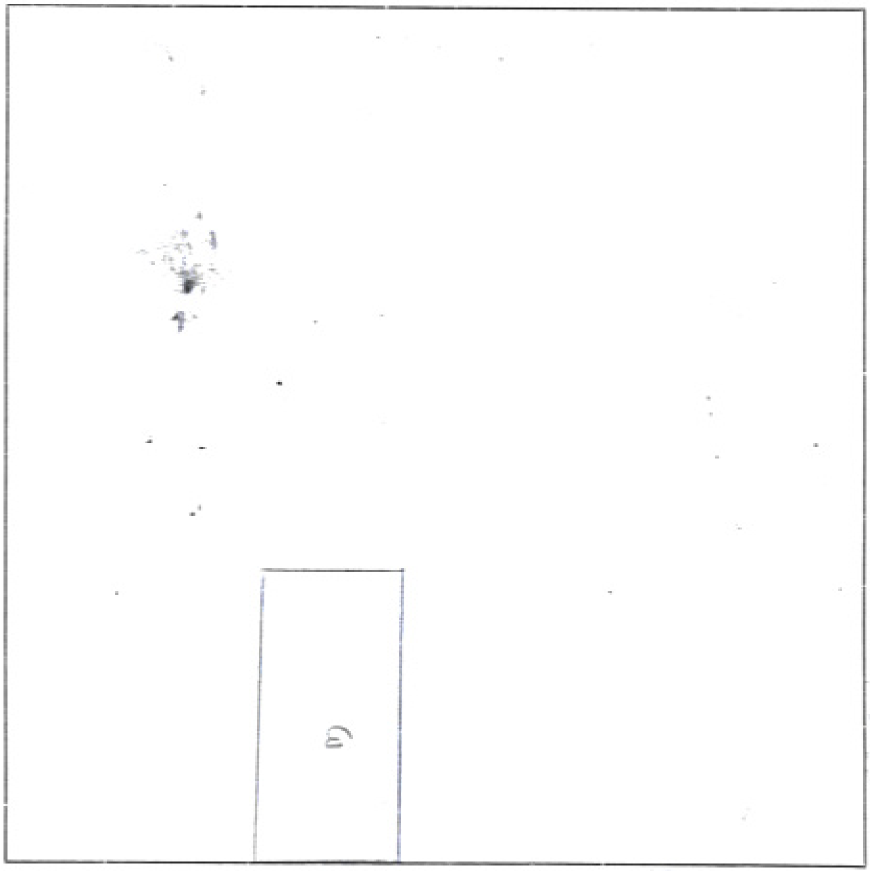
See new

J.A. 5/23/47



LAND CLASSIFICATION OR SEGREGATION

THIS SQUARE INDICATES ______ ACRES

LOT NO.

BLOCK NO.

SECTION W 1/2

TWP. 25

RANGE 3

TAX LOT NO.

PARCEL NO.

AERIAL PHOTO

QUARTER MAP

PLAT MAP 1216

FOLIO

MITS

ard

CODE NO.
2

ADDITION GILMAN PARK

27683 33/5

SW ¼ SECTION 12 TWP 25 N. RANGE 3 EWM BLOCK 173 TRACT OR LOT NO. 12

DESCRIPTION R/W over SEly cor

276830-3315 0 0010

LAND INFORMATION

SIZE OF TRACT OR LOT ____ X ____ TOPOGRAPHY ____ GRADE ____ FT. STREET-ROAD ____ SURFACE ____

ALLEY ____ SIDEWALK ____ SEWAGE ____ WATER ____ PUMP ____ DRAINAGE ____

LANDSCAPING ____ CONDITION ____ TREND ____ VALUE OF LOT $ ____ FRONT STREET

USE ____ DISTRICT ____

LAND USE	SOIL TYPE	CROPS-TIMBER STAND	NO. ACRES	VALUE ACRE	VALUE
				$	$
				$	$
				$	$
				$	$

O LAND SIZE X TOTAL $

ASSESSED VALUE LAND

LOT $

UNIMPROVED ACRES $

IMPROVED ACRES $

OTHER LANDS $

TIMBER $

TOTAL ASSESSED VALUE 50% $

DATE

REMARKS

C	OWNER OR CONTRACT PURCHASER	DATE	FILE NO.	PRICE	MTGE.	STAMP
	N.P.Ry Co					

DISTRICT: ROAD	SCHOOL	WATER	FIRE	
Seattle-1				METRO

ASSESSED VALUE — DECREASE OR INCREASE IN ASSESSED VALUATION

YEAR	ACRES	TIMBER	LAND	BLDGS	TOTAL	DATE	BY	REASON	DECREASE	INCREASE
1940								Operating Property OPERATING PROPERTY		
19										
19										
19										
19										
19										
19										
19										
19										
19										
19										
19										
19										
19										

KING COUNTY ASSESSOR—SEATTLE, WASHINGTON

L&H CO.

1. DISTRICT 39.

CODE NO. 12

PERMIT NO.

DATE

2. ADDITION GILMAN PARK ~~05005~~ 3240

SECTION TWP N. RANGE EWM. BLOCK 172 TRACT OR LOT NO. 22

DESCRIPTION

276830-3240 X 630 0010

3. ADDRESS OF PROPERTY 4606 15th Ave N. W.

4. FEE OWNER W. C. SLOAN,

CONTRACT PURCHASER 4-13-3

5. ARCHITECT

CONTRACTOR

6. ORIG. BUILDING COST $ OCCUPIED BY Tenant RENTAL PER MONTH $ 9. ESTIMATED RENTAL PER MONTH $ 8.

7. CONDITION OF EXTERIOR Poor INTERIOR Poor FOUNDATION Poor FLOOR PLAN Accept.

BUILDING
1 fmly dwell
1 story
3 rooms
3-1st flr

INTERIOR WALLS
3 ceiled

FLOORS
3 fir

FIRE PLACE
None

INTERIOR TRIM
3 fir

PLUMBING
4 fixtures
1 tub-leg
1 toilet
1 sink
1 H. W. Tank
Cheap

TILE WORK
None

ATTIC
None

HEATING
stove

BASEMENT
dug out

FOUNDATION
P & B
pch P & P

ROOF
tar paper

EXTERIOR WALLS
fir siding

PORCHES
1 one story
1 roofed

EXTRA FEATURES
None

BUILT-INS
usual to type

CONSTRUCTION
double-cheap

CEILING HEIGHT
1st flr 9'6"

9. CORNER JOINTS cased DOWN SPOUTS SEWER CONNECTED no

10. FIRST FLOOR JOIST SIZE 2 x 8 AND 18 INCH CENTERS BRIDGED no

11. FIRST FLOOR JOIST SUPPORT COLUMN OR POST SIZE 6 x 6

12. CLASS OR GRADE NO. 1 SHAPE NO.

13. BUILDING FINISHED OR UNFINISHED finished

14. DEPRECIATION: CONDITION 70 % OBSLSE % ECON. SUIT % TOTAL %

DATE BUILT 1902 REMODELED

EFFECTIVE AGE 26 YEARS FUTURE LIFE 7 YEARS

LAND INFORMATION

1. SIZE x TOPOGRAPHY sloping GRADE On FEET
2. STREET ROAD graded SURFACE gravel ALLEY no
3. SIDEWALK conc. SEWERAGE sewer WELL ELECT. PUMP
4. LANDSCAPING None COND.
5. TREND static VALUE OF LAND
6. USE OF DISTRICT Industrial VIEW
7. RESIDENTIAL Medium-Poor ZONED

REMARKS

MAIN BUILDING

DIMENSION			SQ. FT. AREA
12	x	18	
13	x	20	
5	x	12	512
	x		
PCH. 7	x	12	84
PCH.	x		

IMPROVEMENT VALUE

MAIN BUILDING $

OTHER BUILDINGS $

TOTAL 300 $ 74

ASSESSED VALUE 50% 150 $ 7

DATE 5-21-37

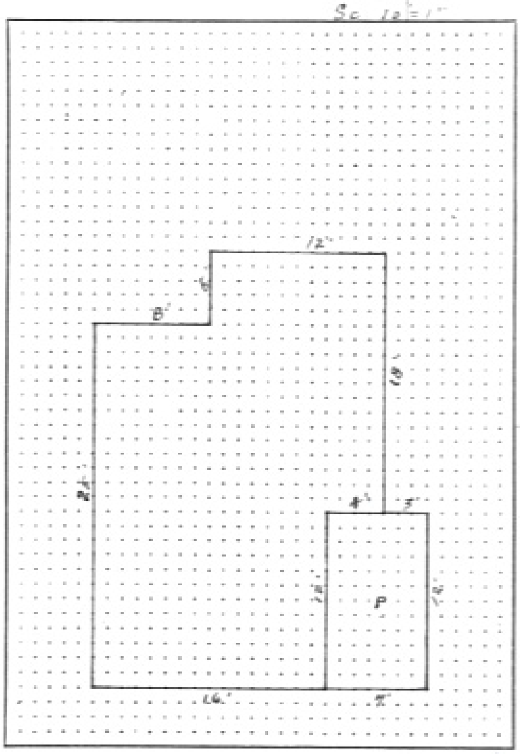
OTHER BUILDINGS	CONSTRUCTION	FLOOR	ROOF	STY.	DIMENSION	AREA	VALUE
GARAGE					x		$
					x		
					x		
					x		
					x		

OWNER OR CONTRACT PURCHASER	DATE	FILE NO.	PRICE	MTGE.	STAMP
City of Seattle	2-5-57	Ord 85883			

REMARKS Few houses in industrial block in poor condition.

FLOOR PLAN

Sc 1/8=1'



FRONT

RESIDENCE — KING COUNTY ASSESSOR — SEATTLE, WASHINGTON

FRATH PRINTING CO., SEATTLE

27683

DISTRICT: ROAD ~~Seattle-1~~ SCHOOL WATER FIRE

METRO DECREASE OR INCREASE IN ASSESSED VALUATION

RECORD OF ASSESSED VALUE								LAND		BUILDING	
YEAR	AC.	LAND	BLDG'S.	TOTAL	DATE	BY	REASON	DECREASE	INCREASE	DECREASE	INCREASE
1938		340	70	410							
1947		340	150	490	5-46	SDR	Reval.				
1958		340	150	490	2-57	Z					
1959		630	150	780	1/6/58	[illegible]	Revalue				
1959		630	—	630	4/15/58	Hm.	Imp Void-Torn down				
1964		630	—	630	11-8-62	BRR	Rev				
1971	XL	1260	B	T	1260*276830-3240-0 8/9						
19											
1972		50	—	50	10-5-70	LLW	RV(1)				
19											
19											
19											
19											
19											
19											
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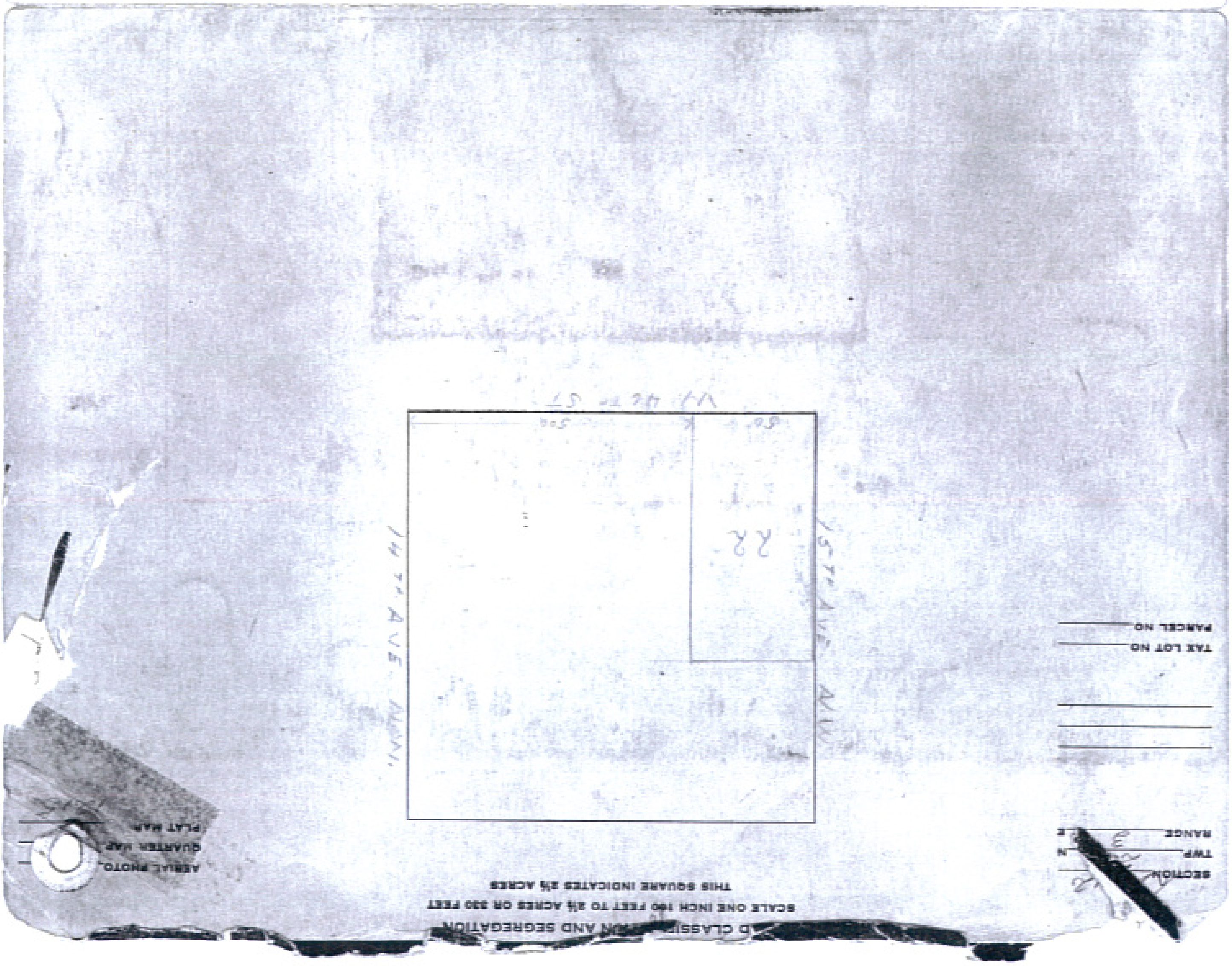
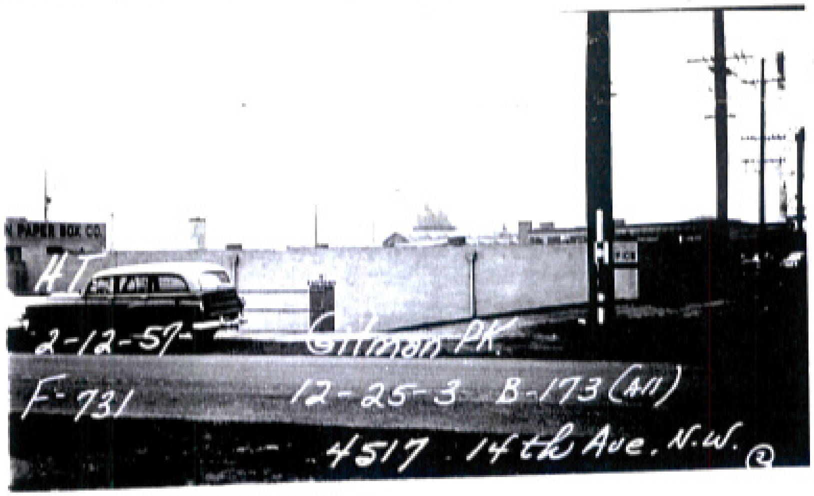



H.T.
12-2-55
F-731
Gilman PK.
12-25-3 B-173 (All)
4517 14th Ave. N.W.


PAPER BOX CO.
H.T.
2-12-57
F-731
Gilman PK.
12-25-3 B-173 (All)
4517 14th Ave. N.W. ②

FOLIO 731

PERMIT NO. 371700 - 433167

DATE 3-21-46 11-18-54

ADDITION GILMAN PARK.

Section 12 Twp. 25 Range 3 Ewn. Block 173 Lot or Tract ALL

Tax Lot

Address 4517 - 14th Ave N.W.

Jacobs Co. 1972 Roll
WM 2

Bldg #1

Subj. to jt esmt for spur track to G.N.R.R. & N.P. Rvs as per ... Lots 1 to 12 incl ... Lot 12

[redacted]

Fee Owner DURABILT Luggage Co. Architect Raymond B

Condition of Exterior F Interior F+G Foundation F Floor Plan: Good Accept. Good

USE Factory

1	No. Stories
	No. Stores
19 ~~15~~	No. Rooms
	Basement
9 ~~X~~	No. Offices
	No. Apartments
	1 rm. ☐ 2 rm. ☐ 3 rm.
	4 rm. ☐ 5 rm. ☐ 6 rm.

ROOF CONSTRUCTION

X	Frame Lam ☐
X	Mill Construction
	Rein. Concrete
16	No. Trusses 72' King Rods
X	Wood ☐ Steel

ROOFING MATERIAL

	Tar and Gravel
Or	Built up

FLOOR FINISHES

	Fir ☐ Maple
	Oak ☐ 2"x6" T&G
Laus	Asph. Lino. ☐ 3"x6" T&G
X	Cement
	Terrazzo
	Rubber tile
Asph	Tile off. lunchroom 1st Aldroom
Or	

not tile

Tile ☐ Lino.

Tile Total	Baths ☐ Fl. ☐ Walls	
	Sq. Ft. Floors	
	Sq. Ft. Walls	
	Lin. Ft. Dr. Bds.	
Lino. Total	Sq. Ft. Floors	
	Sq. Ft. Walls	
	Lin. Ft. Dr. Bds.	
	Kit's ☐ Fl. ☐ Walls	

PLUMBING

36	No. Fixtures
11 9	Toilets
	Tubs, Leg or Pem.
11 9	Basins, Ped.
2	Sinks
3 2	Urinals
	Showers (Tub) (Stall)
	Laundry Trays
1	H. W. Tank Fl. Drains ☐
X	Sprink. Sys. No. Fully Hds.

TYPE OF CONSTRUCTION

	Frame
	Single ☐ Double
X	Ordinary Masonry
	Mill Construction
	Class A Rein. Con.
	Stru. Steel and Con.
	Tile ☐ Brick
X	Con. ☐ Rein. C

Good Med. Cheap

$440

Date Built 1906 add 1946 ☒ Finished ☐ Unfinished ☒ Remodeled 1935-46 & 1955

4517 - 14th Ave

FOUNDATION

	Mud Sills
	Post and Pier
	Brick
X	Concrete
	Pile

BASEMENT

No	Full ☐ %
	Sub-Basement
	Size
	Garage ☐ No. Cars
	Fl.
	Plastered
	Living Rooms
	Service Rooms

HEATING

	Stove FA - 2640 #
	Pipeless Furnace
	Gravity H. A.
2	Air Cond., Fan
18	Suspended Gas. ~~Heater~~
	Steam Heat
	Hot Water
	Oil Burner

Year	Assessed Value
1956	[illegible]
1957	[illegible]
1958	56,300 = HT 57
1959	54,100
60	50,800
65	39,700
71	39,400
72	39425

EXTERIOR WALL CONST.

	Single ☐ Double
	2" x 4" Stud Walls
	2" x 6" Stud Walls
+	~~Brick Walls~~ Conc. Blk
	Brick with Pilasters
X	Concrete Walls Conc. Pilas
X	Con. with Pilasters
	Tile Walls
	Rein. Con. Skel.
	Filler Walls
	Laminated Walls

EXTERIOR FACING

	Siding ☐ Shingles
	Shakes ☐ Stucco
	Brick Veneer
X	Conc. + Conc. Blk Kind
	Stone ☐ Cast S.
	Terra Cotta
	Struct. Glass
	Trim

FLOOR CONSTRUCTION

Joist Con. Size x

O.C. In Bridg. ☐

	Mill Construction
X	Rein. Con. 5" on Add

INTERIOR WALLS

	Stud and Plaster
	Lam. ☐ Plastered
	Plywood post + Bm.
+	Ceiled T&G - Balcony
X	Plaster Board office
X	Painted
	Stain ☐ Varnish
	Kalsomine
	Whitewashed
X	Unfinished whse + Mfg areas

Off Ne Add

acoustical tile offices

INTERIOR TRIM

X	Fir
	Mah. ☐ Oak
	Metal
X	wood Doors
X	wood Windows
	Stained
	Varnished
X	Painted
X	Unfinished - whse + Mfg areas

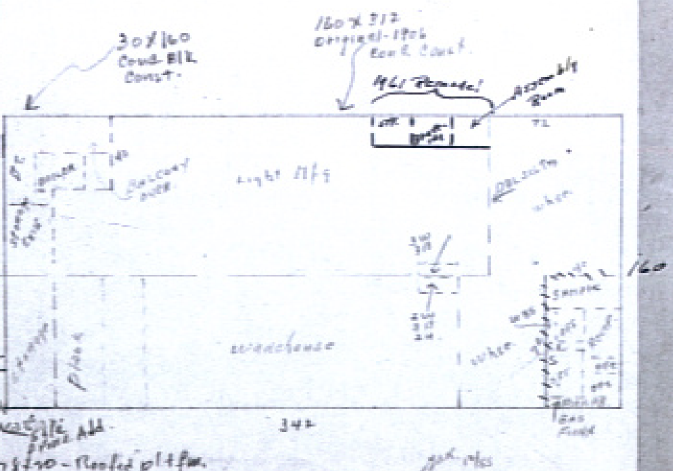
14' Clg

1956 Add

C. H.	
B	
1	9-11 & 15 To 20' - 18'
2	16
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	160
16	
17	
18	
19	
20	
21	
22	

GROUND FLOOR AREA 63970

TOTAL FLOOR AREA 67031



Other Buildings	Construction	Floor	Roof	Stories	Dimensions	S. F. Area	Factor	Value	% Dep.	Depreo.	Net Value
~~Garage~~ (old)	~~opn~~	~~conc~~	~~CS~~	~~1~~	~~38 x 30~~	~~1140~~	~~.75~~	~~$ 855~~	~~60%~~	~~$ 513~~	~~$ 342~~
					x			$		$	$
					x			$		$	$
					x			$		$	$

N.F.B.N. CO.

27683 3245

LIMITS	ROAD	SCHOOL	WATER	FIRE	SEWER	HOSPITAL	AIRPORT	FERRY	
Seattle-1						276830-3245		29700	6580 0010
								METRO	

YR	AC	LAND	BLDGS	TOTAL	BY	DATE	REASON	CD	FEE OWNER	DATE	FILE #	PRICE
1953		8500	30,000	38,500	[illegible]	11-52	Merge					
1957		8,500	43,600	52,100	DJP	3/22/56	Third 30,000 ad. New Dev - Remodel					
1958		8500	56,300	64,800	DE	2/27/57	additions					
1959		22,000	56,300	78,300	Am	1/6/58	Revalue					
1959		22,000	85400 (2)	107,400	EL	5/9/58	1 New Imp & other bldg R.r.					
1960		19,250	85400	104,650	LL	3-25-59	Rv.					
1960		19250	77500 ③	96,750	JB	5/18/59	AV changed					
1961		19250	79800 ②	99,050	JB	5/18/59	AV change					
1960		19080	77500	96,580	[illegible]	5-19-59	Rv.					
1961		19080	79800 ②	98,880	[illegible]	5-19-59	Rv.					
1964		33000	79800	112,900	[illegible]	11-8-62	Rv					
1965		29700	79800	109,500	(OB) [illegible]	7/9/64	Land chg. (Rev. O-Burgess) Office [illegible]				#25	B of E
1965		29700	65800 (2)	95,500	CEA (Eng)	9/29/64	[illegible]		N6C27			
171	L	5940C B	131600 T	191000*276830-3245-0. 8/9								
19												
1972		122320	171930	294250	SB	10/3/70	~~SB~~ Rv G)					
19 72	L	97122 B	136512 T	233634*276830-3245-0 9/71								
19 73	L	122320 B	171930 T	294250*276830-3245-0 9/71								
19												

1-22 173 0010 27683 3245
GILMAN PARK Lots 1 to [illegible] incl less R/W
over SE cor lot 12 Subj to Esmt for
Spur tract GN & NP RR

FOLIO 931
PERMIT NO. [illegible]
DATE [illegible]

ADDITION GILMAN PARK
Sec. SW 12 Twp. 25 Range 3 Block 173 Lot or Tract 10-11 12 & 13
Tax Lot
Jacos Co 1972 Roll
WF-3
Address 1401 W. 46th
#2
#2 WF-3

Fee Owner Pacific Plastics Co (Fabricico)
Architect A. J. Maroney
Condition of Exterior: A Interior: A Foundation: A Floor Plan: Good X

USE Factory
- 1 No. Stories
- No. Stores
- 5 No. Rooms
- Basement
- 1 No. Offices
- No. Apartments: 1 rm. ☐ 2 rm. ☐ 3 rm. 4 rm. ☐ 5 rm. ☐ 6 rm.

ROOF CONSTRUCTION
Rem
- Frame 2¼" T&G Lam. ☐
- X Mill Construction 11×22
- X Rein. Concrete
- No. Trusses
- Wood ☐ Steel

ROOFING MATERIAL
- Tar and Gravel
- Or Built up

FLOOR FINISHES
- Fir ☐ Maple
- Oak ☐ 2"x6" T&G
- 100% Lino. ☐ 2"x4" T&G
- Cement
- Terrazzo
- Rasconith
- Tile
- Or

Tile ☐ Lino.
- Baths ☐ Fl. ☐ Walls
- Sq. Ft. Floors
- Sq. Ft. Walls
- Lin. Ft. Dr. Bds.
- Sq. Ft. Floors
- Sq. Ft. Walls
- Lin. Ft. Dr. Bds.
- Kit's ☐ Fl. ☐ Walls

PLUMBING
- 15 No. Fixtures
- 6 Toilets
- Tub, Leg or Pem.
- 4 Basins, Ped.
- 3 Sinks
- 1 Urinals
- Showers (Tub) (Stall)
- Laundry Trays
- 1 H. W. Tank Fl. Drains ☐
- X Sprink. Sys. No. [illegible] Hds.

TYPE OF CONSTRUCTION
- Frame
- Single ☐ Double
- X Ordinary Masonry
- Mill Construction
- Class A Rein. Con.
- Struc. Steel and Con.
- Tile ☐ Brick
- ✓ Con. ☐ Rein. Con.
- Good ✓ Med. Cheap

Date Built 1957 ☒ Finished ☐ Unfinished ☐ Remodeled
Effective Age 13 Years Future Life Years
Dep. for Cond. Dep. for Ob. Dep. for Ec. Total

HEATING
- Stove FA 1240 #
- Pipeless Furnace
- Gravity H. A. Rem NHC
- X Air Cond., Fan
- Suspended Gas, Hot Water
- Steam Heat
- Hot Water
- X Burner

FOUNDATION
- Mud Sills
- Post and Pier
- Brick
- Concrete
- Pile


OT 4-4-58 B-173 L-10-11-12-13 W. 46TH ST.

Year	Assessed Value
1959	31,300 1959
1960	26,290
1961	29,000
65	[illegible]
71	52,200
72	132,505

BASEMENT
- Full ☐
- ½ Basement
- Garage ☐ No. Cars
- Floors

4000 gal bg
460 # frms 22 Ctr
440 # mst pan clng
100 % sprinkled
460 # dry, frm - wet

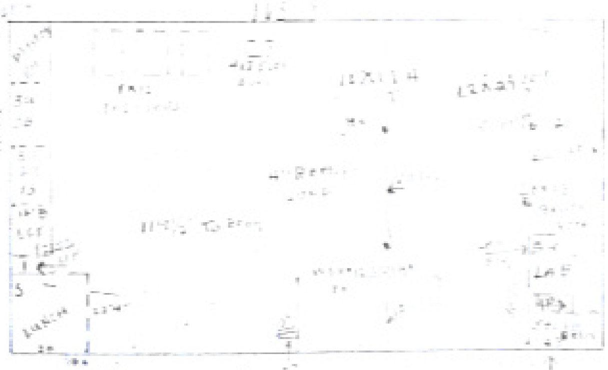
- Auto. ☐ Elec.
- Man. ☐ Hyd.
- ☐ Man.
- Untreated
- Treated Piles only
- Average Length
- Paved
- Flex. Cable
- X Conduit
- X Power Wiring
- Range Wiring
- No. Outlets

EXTERIOR WALL CONST.
- Single ☐ Double
- 2"x4" Stud Walls
- 2"x6" Stud Walls
- Brick Walls
- Brick with Pilasters
- 15" 7, Concrete Walls
- Con. with Pilasters
- Tile Walls
- Conc. Steel
- Filler Walls
- Laminated Walls

INTERIOR WALLS
- Stud and Plaster
- Lam. ☐ Plastered
- Plywood
- Ceiled
- X Plaster Board Panels
- X Painted
- Stain ☐ Varnish
- Kalsomine
- Whitewashed
- Conc. Unfinished

C H
- 1 14' 10
- 9 12

GROUND FLOOR AREA 14996
TOTAL FLOOR AREA 14996



23x92 - 25' hit
Rem - Spec

EXTERIOR FACING
- Siding ☐ Shingles
- Shakes ☐ Stucco
- Brick Veneer
- ✓ Kind
- Stone ☐ Cast S.
- Terra Cotta
- Struc. Glass
- Trim

INTERIOR TRIM
- X Fir
- Mah. ☐ Oak
- X Metal
- Metal Doors
- Metal Windows
- Stained
- Varnished
- X Painted
- Unfinished

Good Fluorescent Lite

FLOOR CONSTRUCTION
- Joist Con. Size x
- O.C. In Bridg. ☐
- Mill Construction
- ✓ Rein. Con. 4"

Other Buildings	Construction	Floor	Roof	Stories	Dimensions	S. F. Area	Factor	Value	% Dep.	Deprec.	Net Value
Garage					x			$		$	$
					x			$		$	$
					x			$		$	$
					x			$		$	$

SM 2-59

FOLIO 731

PERMIT No. 371700

DATE 3-21-46

ADDITION Gilman Park

Section Twp Range Ewm Block 173 Tract or Lot 3

entire Blok

4517- 14th Ave N.W.

~~Lot 3 Bk 2 No 70' of W 30~~
~~& S 30' of 9 & 10 exc W 35' & 14~~
~~& all of 15 Bk 2 ... Por of above exc~~
~~D it exc for spur track to G N Ry & N P Ry~~
~~per ... of 4/15/47)~~ LOTS 1 TO 22 INCL
LESS R/W OVER SELY COR LOT 12

Fee Owner

Condition of Exterior 9 Interior 9 Foundation 9

USE Cannery

- 1 No. Stories
- No. Stores
- 11 No. Rooms
- Basement
- 3 No. Offices
- No. Apartments
- 1 rm. ☐ 2 rm. ☐ 3 rm.
- 4 rm. ☐ 5 rm. ☐ 6 rm.

ROOF CONSTRUCTION

- X Frame Lam ☐
- Mill Construction
- Rein. Concrete
- 16 No. Trusses 70' Kn ...
- X Wood ☐ Steel

ROOFING MATERIAL

- Tar and Gravel
- Or.

FLOOR FINISHES

- Fir ☐ Maple
- Oak ☐ 2" x 6" T&G
- Lino. ☐ 3" x 6" T&G
- X Cement
- Terrazzo
- Rasconlith
- Tile
- Or.

Baths ☐ Fl. ☐ Walls
Tile Total: Sq. Ft. Floors; Sq. Ft. Walls; Lin. Ft. Dr. Bds.
Lino. Total: Sq. Ft. Floors; Sq. Ft. Walls; Lin. Ft. Dr. Bds.
Kit. ☐ Fl. ☐ Walls

PLUMBING

- 15 No. Fixtures
- 7 Toilets
- Tubs, Leg or Pem.
- 2 Basins, Ped.
- 4 Sinks
- 1 Urinals
- Showers (Tub) (Stall)
- Laundry Trays
- 1 H.W.Tank Fl. Drains ☐
- Sprink. Sys. No. Hds.

Date Built 1946 ☒ Finished ☐ Unfinished ☒ Remodeled 1938

Effective Age Years Future Life Years

Dep. for Cond. Dep. for Ob. Dep. for Ec. Total

See Remodel 12/55

4517 ...

TYPE OF CONSTRUCTION

- Frame
- Single ☐ Double
- X Ordinary Masonry
- Mill Construction
- Class A Rein. Con.
- Stru. Steel and Con.
- Tile ☐ Brick
- Con. ☐ Rein. Con.

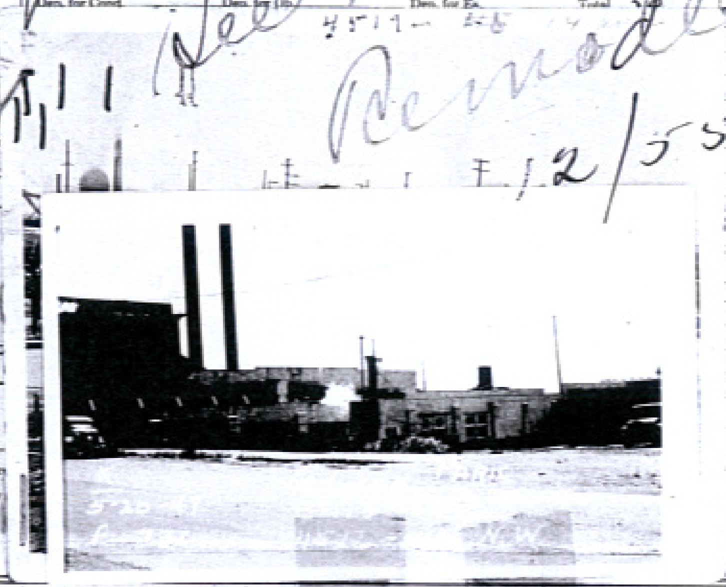
Good Med X Cheap

FOUNDATION

- Mud Sills
- Post and Pier
- Brick
- X Concrete
- Pile

BASEMENT

- Full ☐ %
- Sub-Basement
- Side
- Garage ☐ No. Cars
- Floor
- Plastered
- Living Rooms
- Service Rooms



HEATING

- Stove
- Pipeless Furnace
- Gravity H. A.
- 2 Air Cond., Fan
- Arcola
- 1-Pipe Steam
- X 2-Pipe St. or Vapor
- Hot Water
- Oil Burner
- Coal Stoker

WIRING

- Knobs & Tube
- Flex Cable
- X Conduit
- X Power Wiring
- Range Wiring
- No. Outlets

ELEVATORS

- Pass. ☐ Freight
- Auto ☐ Elec.
- Man. ☐ Hyd.
- ☐ Man.

30000

EXTERIOR WALL CONSTR.

- Single ☐ Double
- 2" x 4" Stud Walls
- 2" x 6" Stud Walls
- Brick Walls
- Brick With Pilasters
- X Concrete Walls
- X Con. With Pilasters
- Tile Walls
- Rein. Con. Skel.
- Filler Walls
- Laminated Walls

INTERIOR WALLS

- Stud and Plaster
- Lam. ☐ Plastered
- Ply Wood
- Ceiled
- Plaster Board
- X Painted
- Stain ☐ Varnish
- Kalsomine
- Whitewashed
- X Unfinished

GAS STATIONS

- Frame
- Metal
- Masonry
- Plastered or Ceiled
- Floors

SERVICE BUILDING

- Frame
- Metal
- Masonry
- Plastered or Ceiled
- Floors

EXTERIOR FACING

- Siding ☐ Shingles
- Shakes ☐ Stucco
- Brick Veneer
- X Conc. Kind
- Stone ☐ Cast S.
- Terra Cotta
- Struct. Glass
- Trim

INTERIOR TRIM

- X Fir
- Mah. ☐ Oak
- Metal
- X wood Doors
- wood Windows
- Stained
- Varnished
- X Painted
- Unfinished

TANKS, ETC., LIST

- 1 2000 gal. ...
- 1 Hoists: ~~Elect~~ X Hyd.

DOCKS AND PIERS

- Treated Piles and Timbers
- Untreated
- Treated Piles only
- Average Length
- Paved

C.H.: S.B. / B / 1 104/2 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 17 / 18 / 19 / 20 / 21 / 22

GROUND FLOOR AREA

TOTAL FLOOR AREA 55320

Cold storage

160

FLOOR CONSTRUCTION

Joist Con. Size x

O. C. In Bridg ☐

Mill Construction

X Rein. Con.

	Other Buildings	Construction	Floor	Roof	Stories	Dimensions	S.F. Area	Factor	Value	% Dep.	Depre.	Net Value
	~~Cabins~~	~~Fr. ...~~ ~~open stud~~	~~Fir~~	~~C. ...~~	~~1-7'6"~~	~~x 14 x 24~~	~~1660~~	~~40~~	~~672~~		$	$
						x			$		$	$
						x			$		$	$
						x			$		$	$

1M 4-46 53

276831 3245

LIMITS	ROAD	SCHOOL	WATER	FIRE	TOTAL ACREAGE	TIMBER	IMPROVED	UNIMPROV
Ballard								
2								

YR	AC	LAND	BLDGS.	TOTAL	BY	DATE	REASON	FEE OWNER	DATE
1947		5110	20000	25110	Mac	4-46	RV		
1948		5110	30000	35110	GL	6-47	[illegible] remodeled & added to		
1953		8500	30000	38500	JS	11-52	Merge		
19									
19									
19									
19									
19									
19									
19									
19									
19									
19									
19									
19									
19									
19									

APPENDIX B

Certified Sanborn Fire Insurance Map Report

Certified Sanborn® Map Report

Sanborn® Library search results
Certification # 878A-447E-B777

Wesmar Property
1451 Northwest 46th Street
Seattle, WA 98107

Inquiry Number 2048222.1s

October 09, 2007

EDR® Environmental
Data Resources Inc

The Standard in Environmental Risk Information

440 Wheelers Farms Rd
Milford, Connecticut 06461

Nationwide Customer Service

Telephone:	1-800-352-0050
Fax:	1-800-231-6802
Internet:	www.edrnet.com

Certified Sanborn® Map Report

10/09/07

Site Name:
Wesmar Property
1451 Northwest 46th Street
Seattle, WA 98107

EDR Inquiry # 2048222.1s

Client Name:
Sound Environmental
2400 Airport Way South
Seattle, WA 98134-2020

Contact: Erin K. Rothman

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Sound Environmental Strategies were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: Wesmar Property
Address: 1451 Northwest 46th Street
City, State, Zip: Seattle, WA 98107
Cross Street:
P.O. # 0398-001-02
Project: Wesmar
Certification # 878A-447E-B777

Sanborn® Library search results
Certification # 878A-447E-B777

Maps Identified - Number of maps indicated within "( )"

1968	(1)
1950	(1)
1917	(1)
1905	(1)

Total Maps: 4

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

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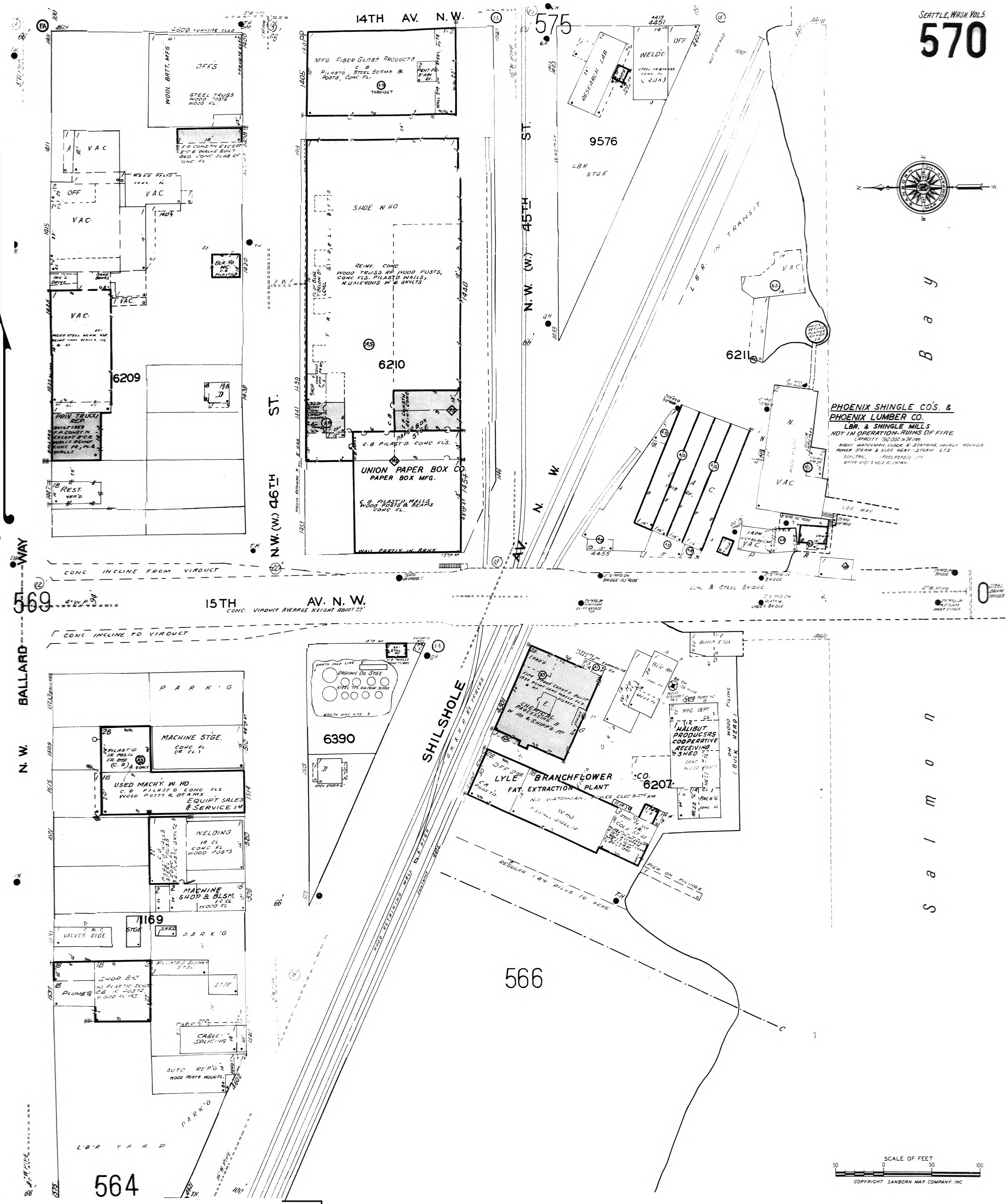
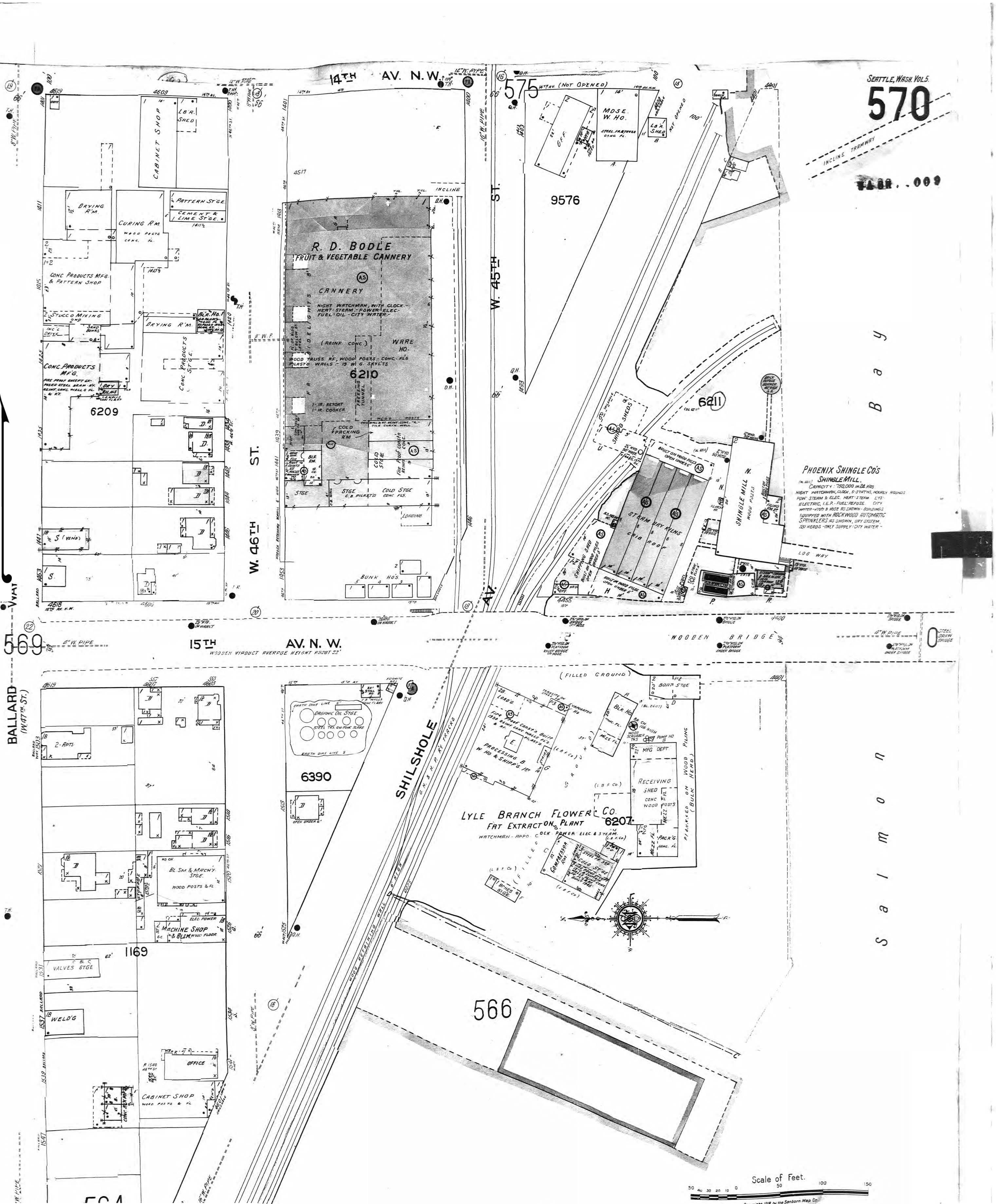
Certification # 878A-447E-B777

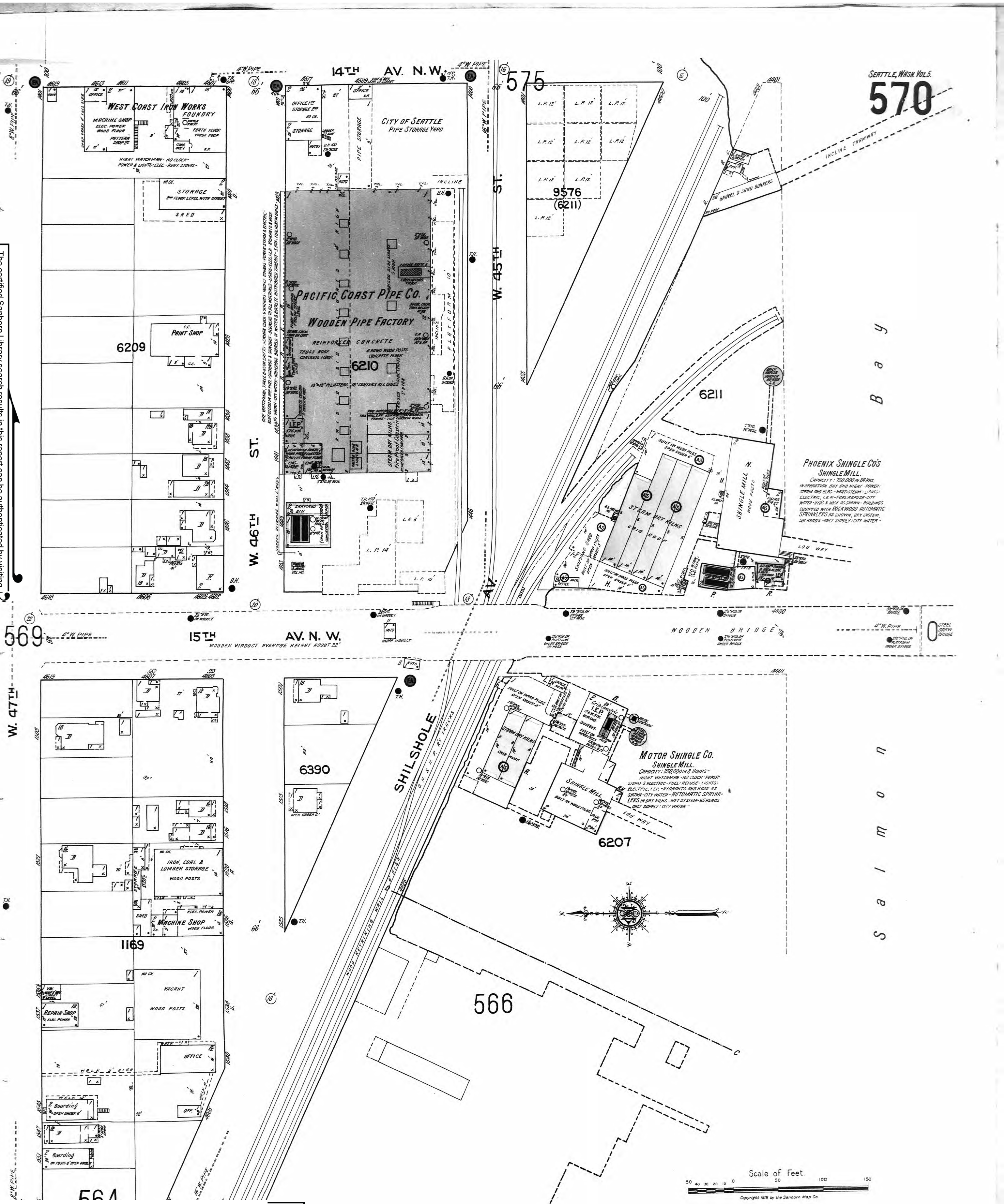


Site Name: Wesmar Property
Address: 1451 Northwest 46th Street
City, ST, ZIP: Seattle WA 98107
Client: Sound Environmental Strategies
EDR Inquiry: 2048222.1s
Order Date: 10/9/2007 6:02:07 PM
Certification # 878A-447E-B777
Research Associate: TMC
Copyright: 1968

Certification # 878A-447E-B777



Site Name: Wesmar Property
Address: 1451 Northwest 46th Street
City, ST, ZIP: Seattle WA 98107
Client: Sound Environmental Strategies
EDR Inquiry: 2048222.1s
Order Date: 10/9/2007 6:02:07 PM
Certification # 878A-447E-B777
Research Associate: TMC
Copyright: 1950



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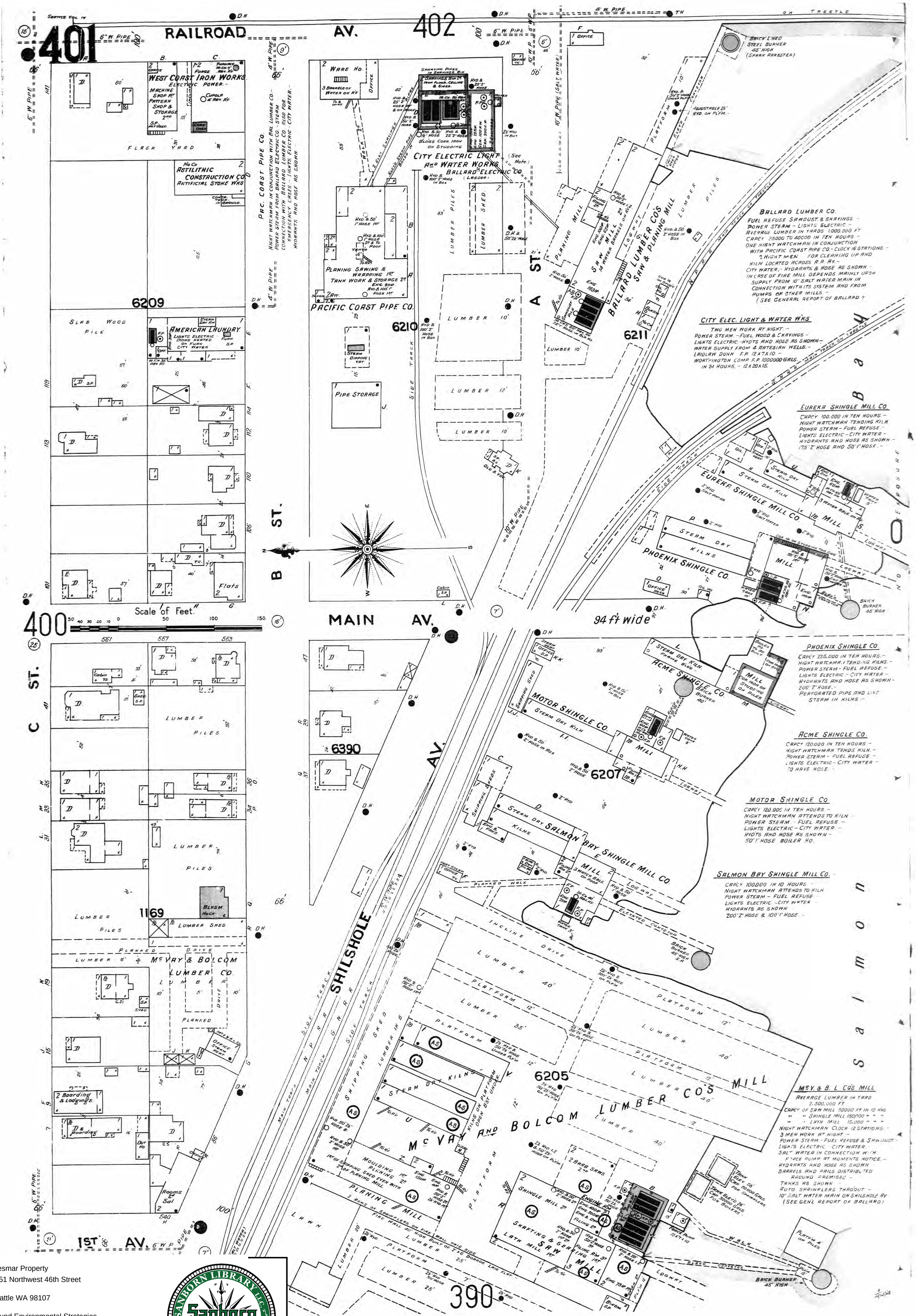
Certification # 878A-447E-B777

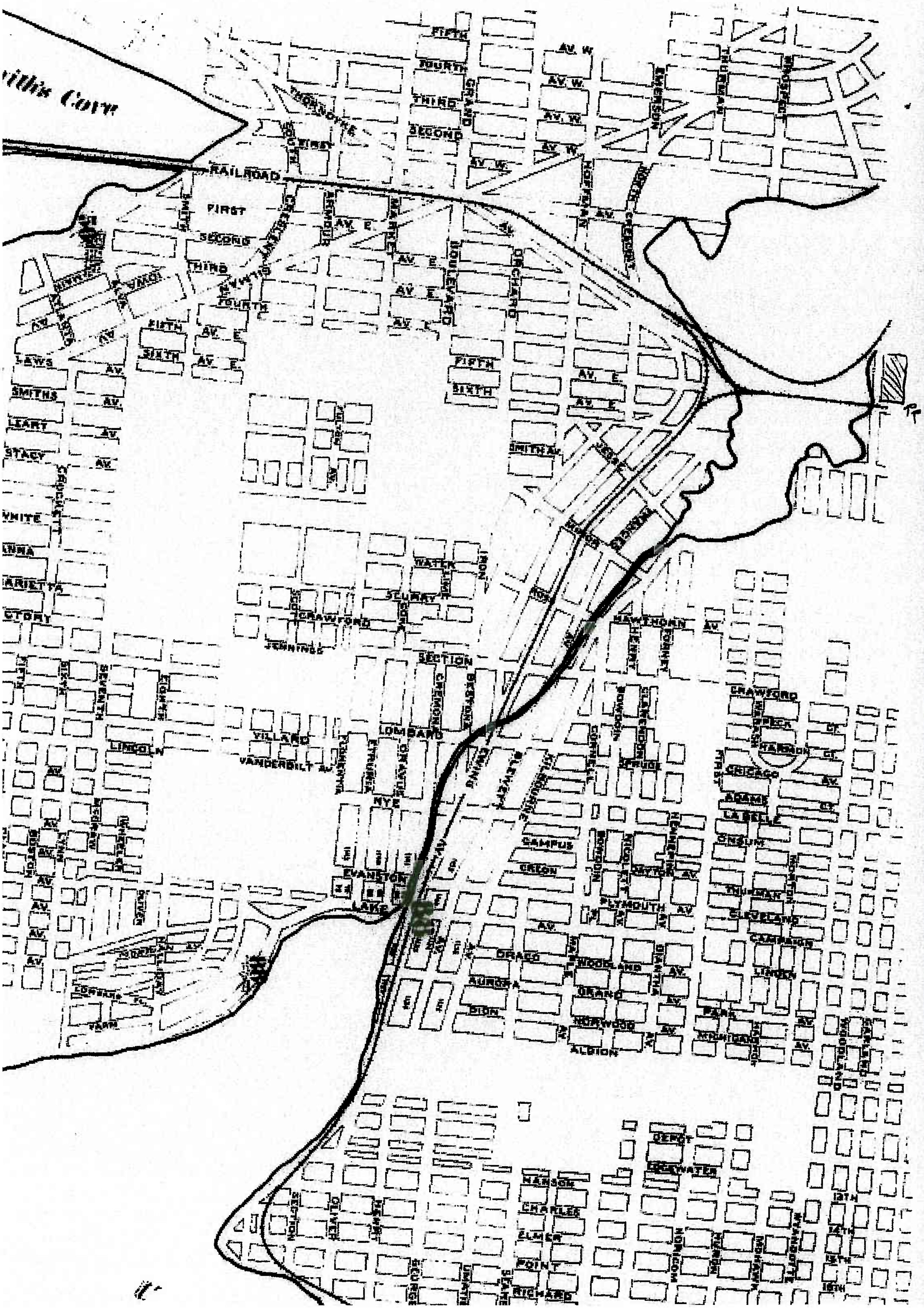
Site Name:	Wesmar Property
Address:	1451 Northwest 46th Street
City, ST, ZIP:	Seattle WA 98107
Client:	Sound Environmental Strategies
EDR Inquiry:	2048222.1s
Order Date:	10/9/2007 6:02:07 PM
Certification #	878A-447E-B777

Research Associate: TMC Copyright: 1917



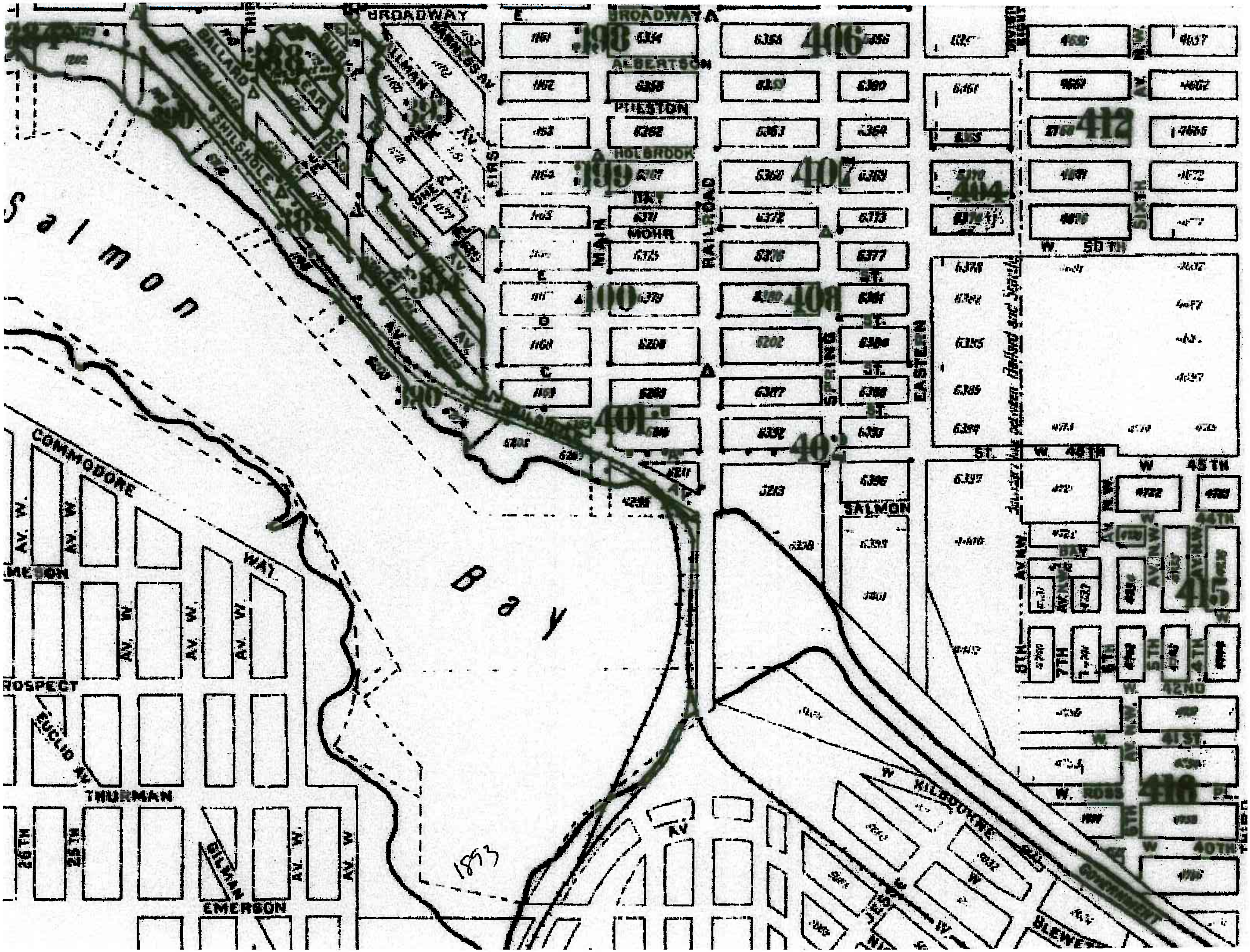
Site Name: Wesmar Property
Address: 1451 Northwest 46th Street
City, ST, ZIP: Seattle WA 98107
Client: Sound Environmental Strategies
EDR Inquiry: 2048222.1s
Order Date: 10/9/2007 6:02:07 PM
Certification # 878A-447E-B777
Research Associate: TMC
Copyright: 1905

APPENDIX C
Historical Maps


ith's Cove
FIFTH
FOURTH
THIRD
SECOND
FIRST
AV. W.
THORNDYKE
RAILROAD
ARMOUR
AV. E.
BOULEVARD
ORCHARD
EMERSON
THURMAN
PROSPECT
NEWTON
GREGORY
FIFTH
SIXTH
SMITH AV.
LAWS
SMITHS
STACY
WHITE
ANNA
MARIETTA
CTORY
WATER
CRAWFORD
JENNINGS
SECTION
LOMBARD
VILLARD
VANDERBILT AV.
LINCOLN
NYE
EVANSTON
LAKE
HAWTHORN AV.
CRAWFORD
CHICAGO
ADAMS
LA BELLE
SPRUCE
CAMPUS
CREON
DAYTON AV.
PLYMOUTH AV.
THURMAN
CLEVELAND
DRAKE
WOODLAND AV.
AURORA
GRAND
DION
NORWOOD
ALBION
LINDEN
PARK
MICHIGAN AV.
DEPOT
EDGEWATER
HANSON
CHARLES
ELMER
POINT
RICHARD
13TH
14TH
15TH
16TH
RR

1883


GREEN LAKE
SALMON BAY.
GRAND BOULEVARD
96
SMITH'S COVE
SEATTLE LAKE SHORE & EASTERN
GREAT NORTHERN R.R.


Salmon Bay
BROADWAY
E. BROADWAY
ALBERTSON
PRESTON
HOLBROOK
DAY
MOHR
E
D
C
BALLARD
SHILSHOLE
FIRST
MAIN
RAILROAD
SPRING
EASTERN
GILMAN AV.
BARNES AV.
ST.
SALMON
W. 50TH
W. 45TH
W. 44TH
W. 42ND
W. 41 ST.
W. ROSS PL.
W. 40TH
BAY
8TH
7TH
6TH
5TH
4TH
AV. N.W.
W. KILBOURNE
GOVERNMENT
BLEWETT
COMMODORE
WAY
AV. W.
JAMESON
PROSPECT
EUCLID AV.
THURMAN
GILMAN
EMERSON
26TH
25TH
SIXTH
THIRD
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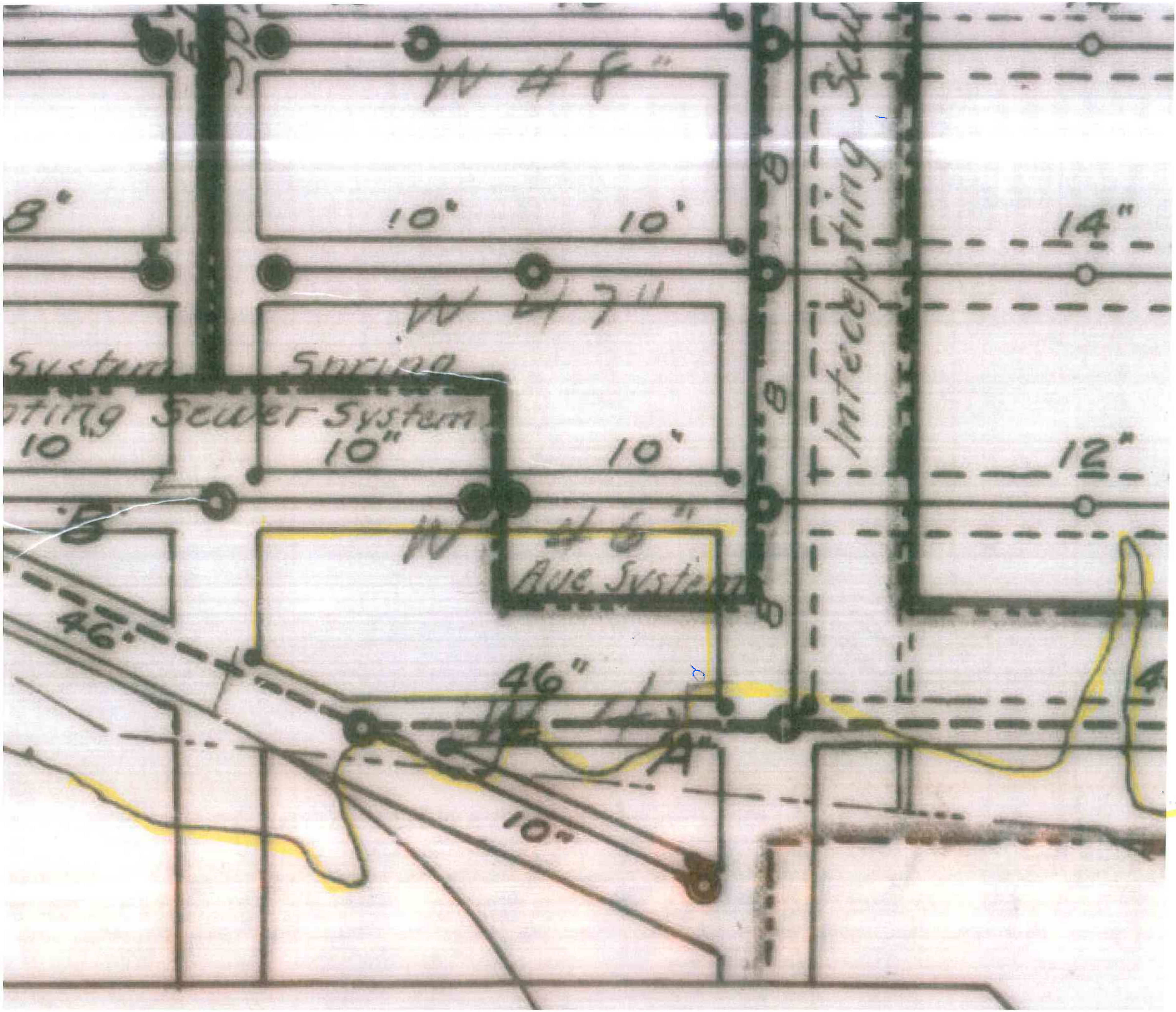
392

1893



shore line

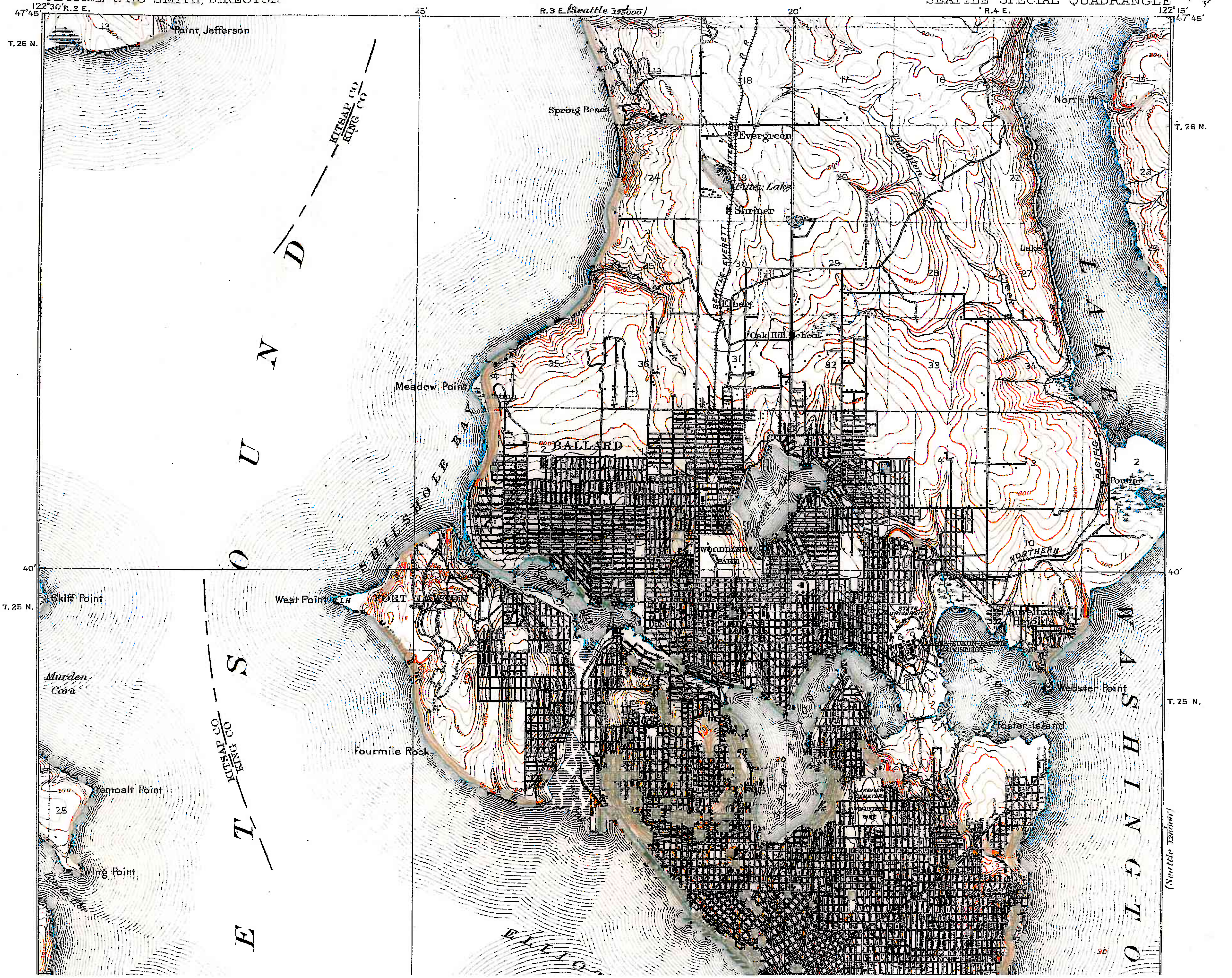
1903
Ballard Sewers

1908

U.S. GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

TOPOGRAPHY

WASHINGTON
SEATTLE SPECIAL QUADRANGLE (Seattle 1/125000)



Condemnation of

SHILSHOLE AVENUE et al.

Changing and Establishing of Grades.

Ordinance No. 29834.

Approved Aug. 15, 1912.

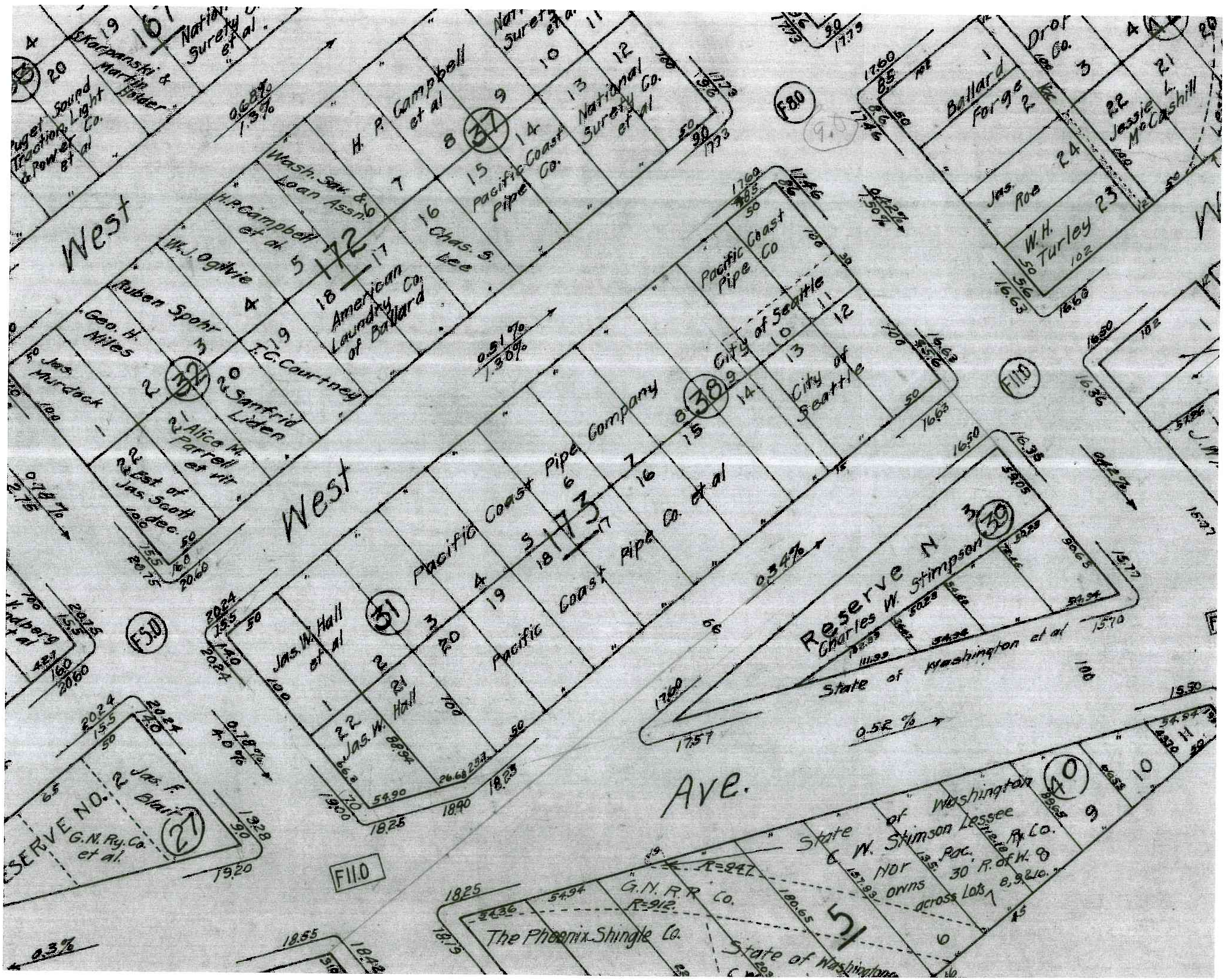
May 1913.

Scale 1 inch = 100 feet.

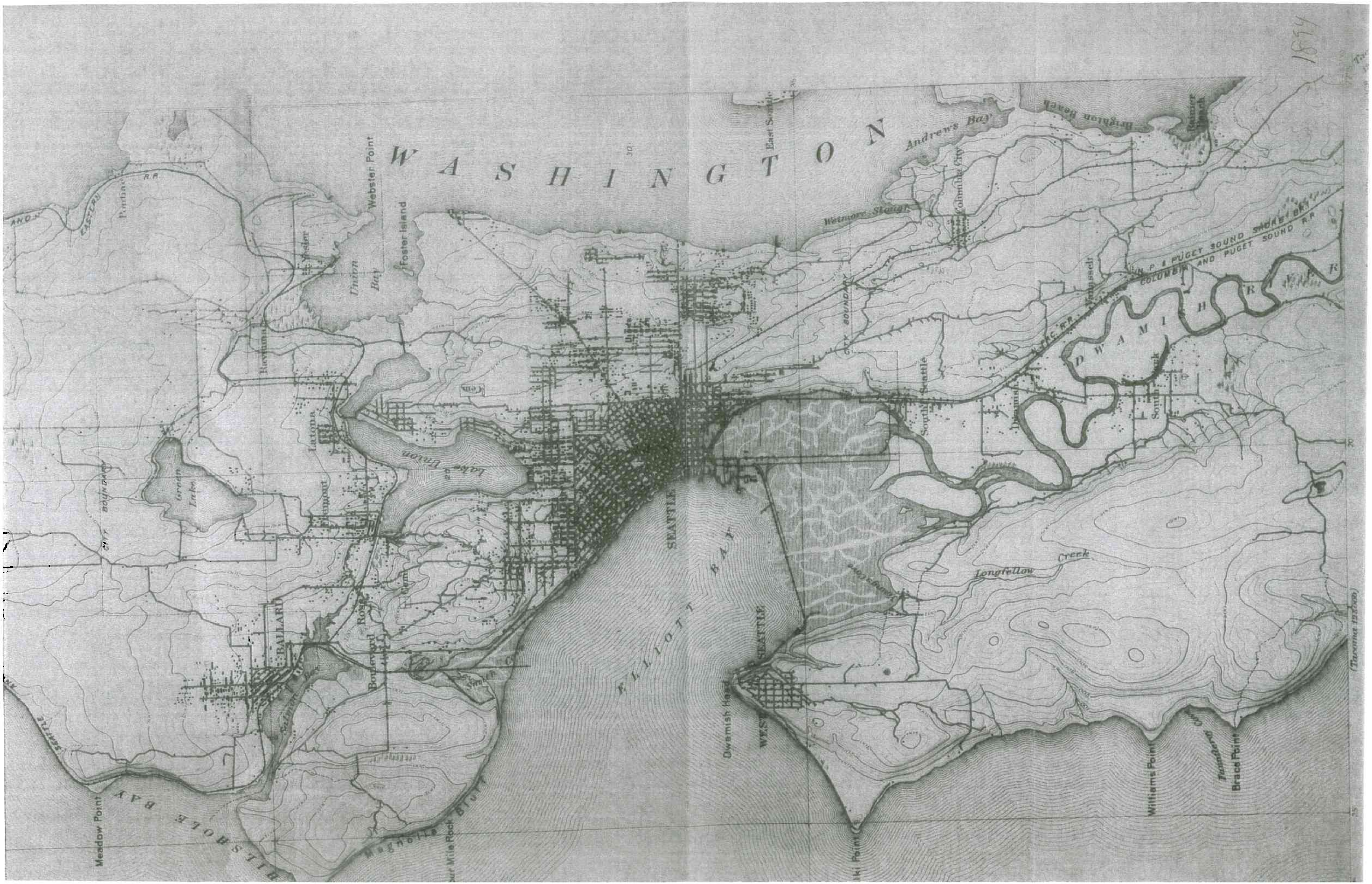
A. H. Dimock,
City Engineer.

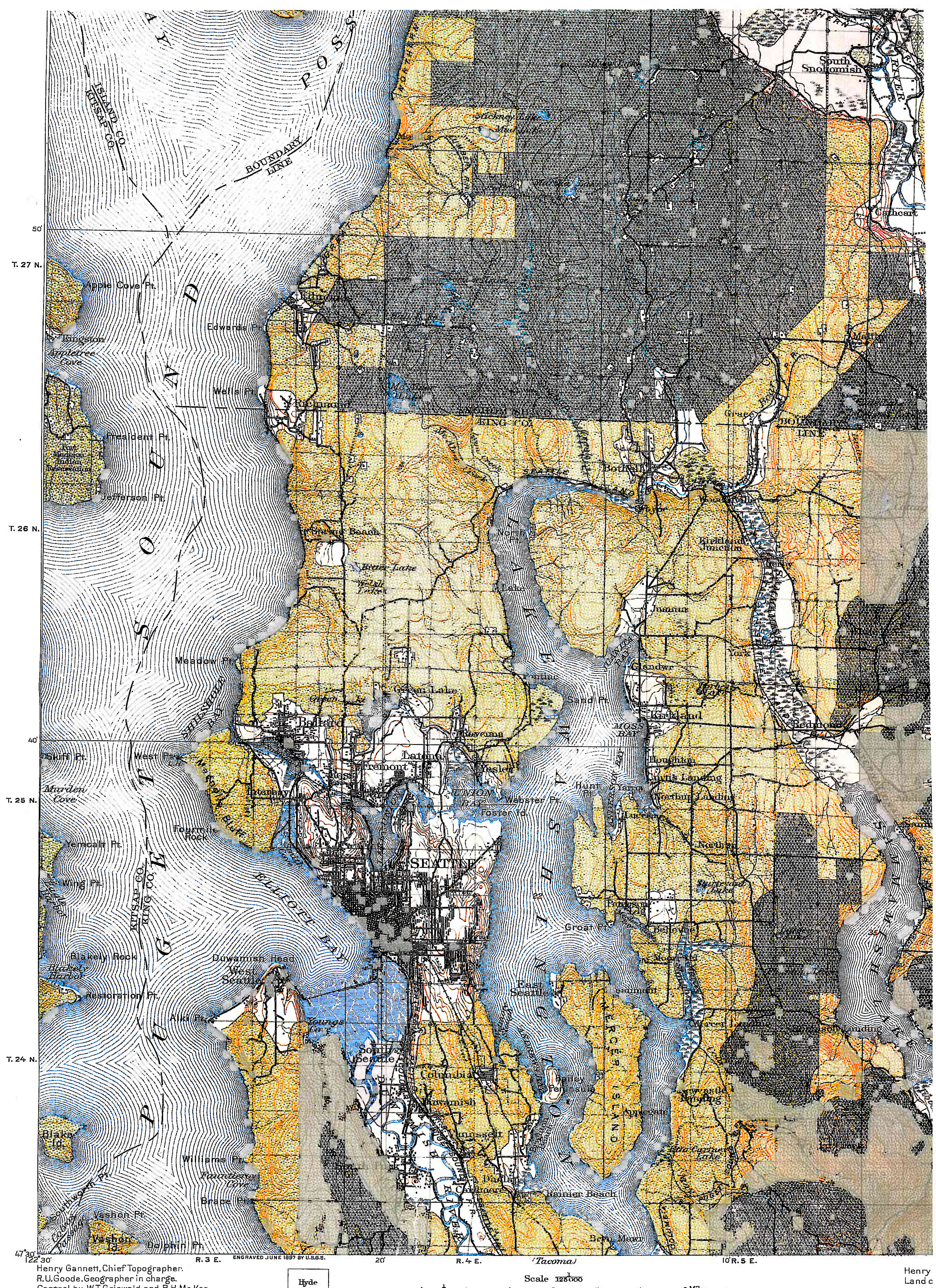
Work Order No........ Drawing No........	Date	Checked by	Date ....191....
Made by Shinkle	5-23 1913	Rech'ked by	........191....

Awards accepted by City Council Aug. 11th 1913.


West
West
Ave.
167
172
173
51
F8.0
F11.0
F5.0
F11.0
37
38
39
40
31
27
Puget Sound Traction, Light & Power Co. et al
Starpanski & Martin Holder
National Surety Co. et al
H. P. Campbell et al
Wash. Sav. & Loan Assn.
H.P. Campbell et al
W. J. Ogilvie
Ruben Spohr
T.C. Courtney
American Laundry Co. of Ballard
Chas. S. Lee
Pacific Coast Pipe Co.
National Surety Co. et al
Geo. H. Miles
Jas. Murdock
Sanfrid Liden
Alice M. Parrell et vir
Est. of Jas. Scott dec.
Ballard Forge
Dror Co.
Jessie L. McCashill
Jas. Roe
W.H. Turley
Pacific Coast Pipe Co
City of Seattle
City of Seattle
Pacific Coast Pipe Company
Pacific Coast Pipe Co. et al
Pacific Coast Pipe Co.
Jas. W. Hall et al
Jas. W. Hall
Reserve N 3
Charles W. Stimpson
State of Washington et al
Reserve No. 2
Jas. F. Blair
G.N. Ry. Co. et al
State of Washington
C. W. Stimson Lessee
Nor. Pac. Ry. Co. owns 30' R. of W. across Lots 7, 8, 9 & 10.
G.N.R.R. Co.
R=947
R=912
The Phoenix Shingle Co.
State of Washington
0.68%
1.3%
0.51%
1.30%
0.42%
1.50%
0.34%
0.52%
0.78%
2.75
0.78%
4.0%
0.3%
9.0

1894


WASHINGTON
Webster Point
Foster Island
Union Bay
Yesler
Ravenna
Latona
Fremont
Green Lake
Lake Union
City Boundary
Eastern R.R.
Ballard
Salmon Bay
Boulevard
Ross
Smith Cove
Magnolia Bluff
Four Mile Rock
Meadow Point
Shilshole Bay
Seattle
Elliott Bay
West Seattle
Duwamish Head
Alki Point
Williams Point
Fauntleroy Cove
Brace Point
Longfellow Creek
Duwamish River
South Seattle
South Park
Columbia City
Wetmore Slough
Andrews Bay
Brighton Beach
Rainier Beach
East Seattle
Van Asselt
N. Pac. R.R.
N. P. & Puget Sound Shore R.R.
Columbia and Puget Sound R.R.
(Tacoma 1:125000)



Henry Gannett, Chief Topographer.
R. U. Goode, Geographer in charge.
Control by W. T. Griswold and R. H. Mc Kee.
Topography by G. E. Hyde and R. H. Mc Kee.
Surveyed in 1893-94-95.

Hyde
Mc Kee

Scale $\frac{1}{125000}$

1 ½ 0 1 2 3 4 5 Miles

1 ½ 0 1 2 3 4 5 Kilometers

Contour interval 50 feet.

Datum is mean sea level.

Edition of Mar 1900.

1897

Henry
Land c
and
Su

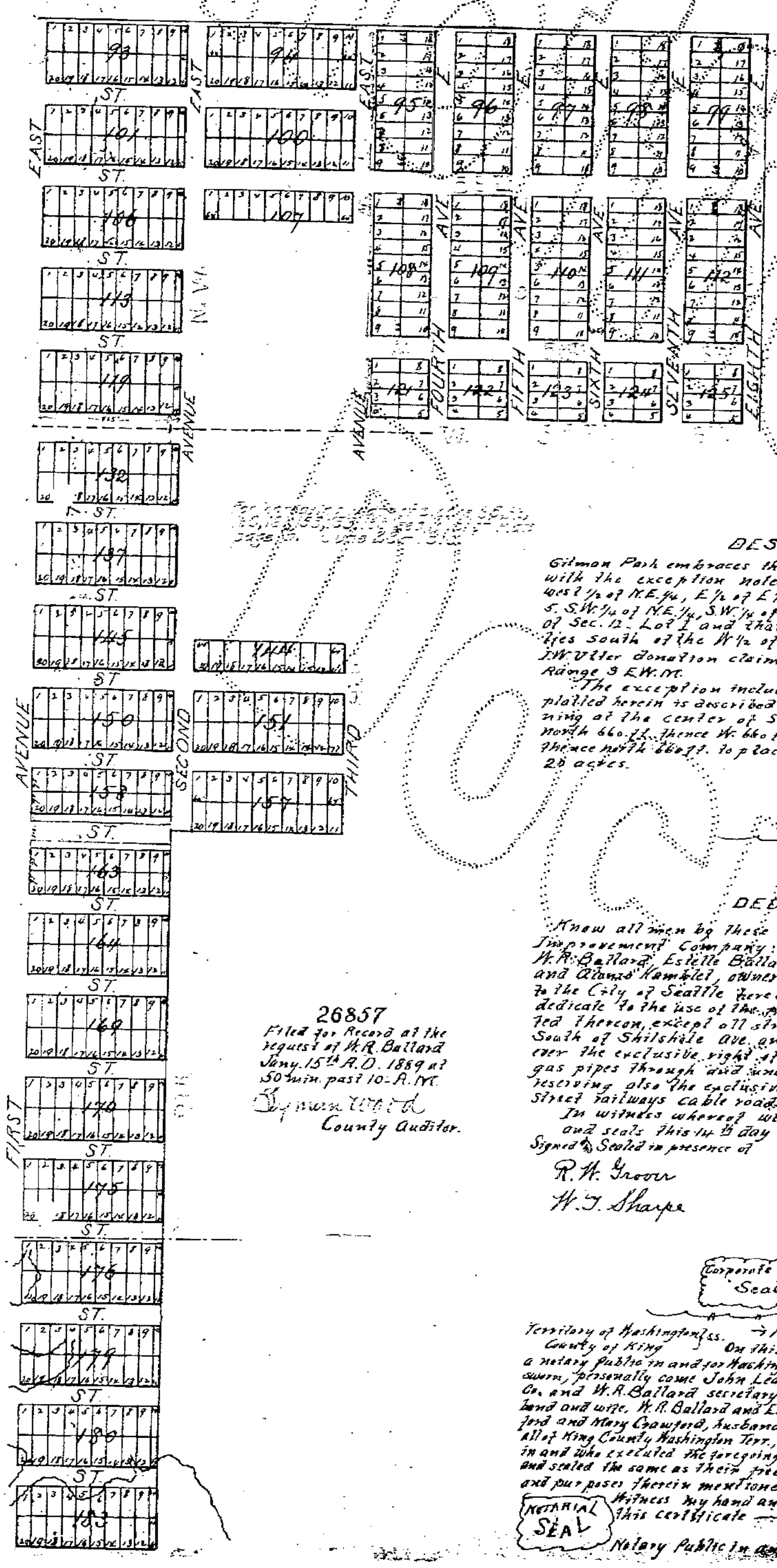
APPENDIX D
ROW Dedication

MAP OF

GILMAN PARK

Scale 30 ft = 1 inch.

Scurry & Owens
Civil Engineers



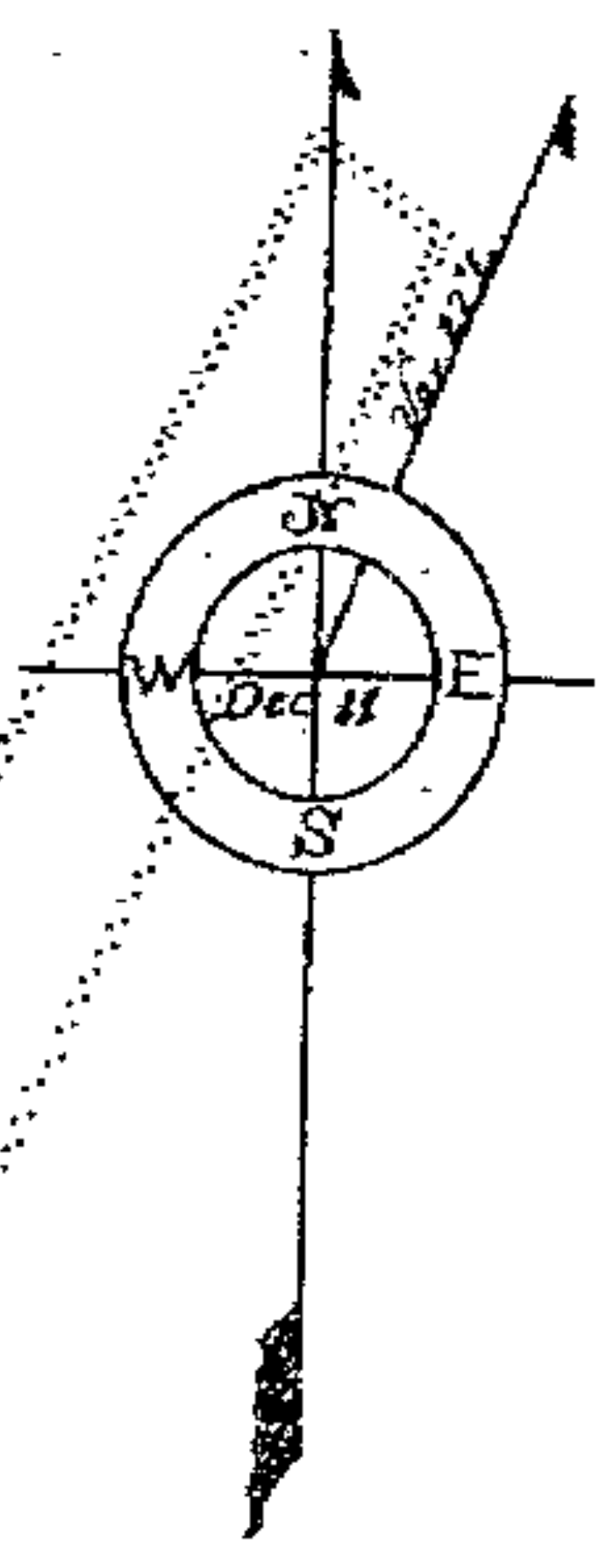
EXPLANATION

The Initial point of this plat is at the intersection of Broadway and Main Str. and distant 135 ft. east of the ¼ Sec. cor. between Secs. 11 and 12. Main Str. is parallel to the line between the above mentioned ¼ Sec. Cor. and the Cor. to Secs. 11. 12. 13 and 14.

Lots generally 50'x100' Blocks of various lengths as indicated by plat.

Streets 66 ft. wide except Main Str. which is 99 ft wide Railroad ave. 100' Broadway 100' Main str. 112' Shilshole ave. 100' Fourth ave. west 100' Eighth ave. east and Fifth ave. west are as indicated by plat.

INSTRUMENT AFFECTING



DESCRIPTION

Gilman Park embraces the following described land to-wit; with the exception noted below, Lots 1-2-7-8-9-10-11 and west ½ of N.E.¼, E½ of E½ of N.W.¼, Sec. 11. Lots 1-2-3 and 5. S.W.¼ of N.E.¼, S.W.¼ of S.W.¼ and W.½ of S.E.¼ of S.W.¼ of Sec. 12. Lot 1 and that portion of lot 2. Sec. 13 which lies south of the W½ of S.E.¼ of S.W.¼ Sec. 12. also the I.W. Utter donation claim No. 37, Not. 1323, all in Twp 25 N. Range 3 E.W.M.

The exception included in above description and not platted herein is described as follows to-wit: a tract beginning at the center of Sec. 12 Twp. 25 N. Range 3 E., thence North 660 ft. thence W. 660 ft. thence S. 1320 ft. thence E 660 ft. thence north 660 ft. to place of beginning, Containing 20 acres.

SEE SURVEY VOL 13 PGE 44

ILLEGIBILITY DUE TO DAMAGE OF ORIGINAL

DEDICATION

Know all men by these presents: that the West Coast Improvement Company: John Leary; Mary B. Leary, W.R. Ballard, Estelle Ballard, Wm Crawford, Mary Crawford and Alonzo Hamblet, owners in fee simple of Gilman Park, to the City of Seattle hereby declare this plat and hereby dedicate to the use of the public forever all the streets platted thereon, except all streets West of Railroad ave. and South of Shilshole ave. and excepting and reserving however the exclusive right of laying down water pipes and gas pipes through and under the streets of said plat and reserving also the exclusive rights for electric lights, Street railways cable roads and steam or electric railways.

In witness whereof we have hereunto set our hands and seals this 14th day of January A.D. 1889.

Signed & Sealed in presence of

R.H. Groover
W.T. Sharpe

John Leary (L.S.)
Mary B. Leary (L.S.)
by John Leary her attorney in fact
W.R. Ballard (L.S.)
Estell Ballard (L.S.)
William Crawford (L.S.)
Mary Crawford (L.S.)
Alonzo Hamblet (L.S.)

Corporate Seal
West Coast Improvement Company
by John Leary President
W.R. Ballard Secretary

26857
Filed for Record at the request of W.R. Ballard Jany. 15th A.D. 1889 at 50 min. past 10 A.M.
Lyman Wood
County Auditor.

ACKNOWLEDGEMENT

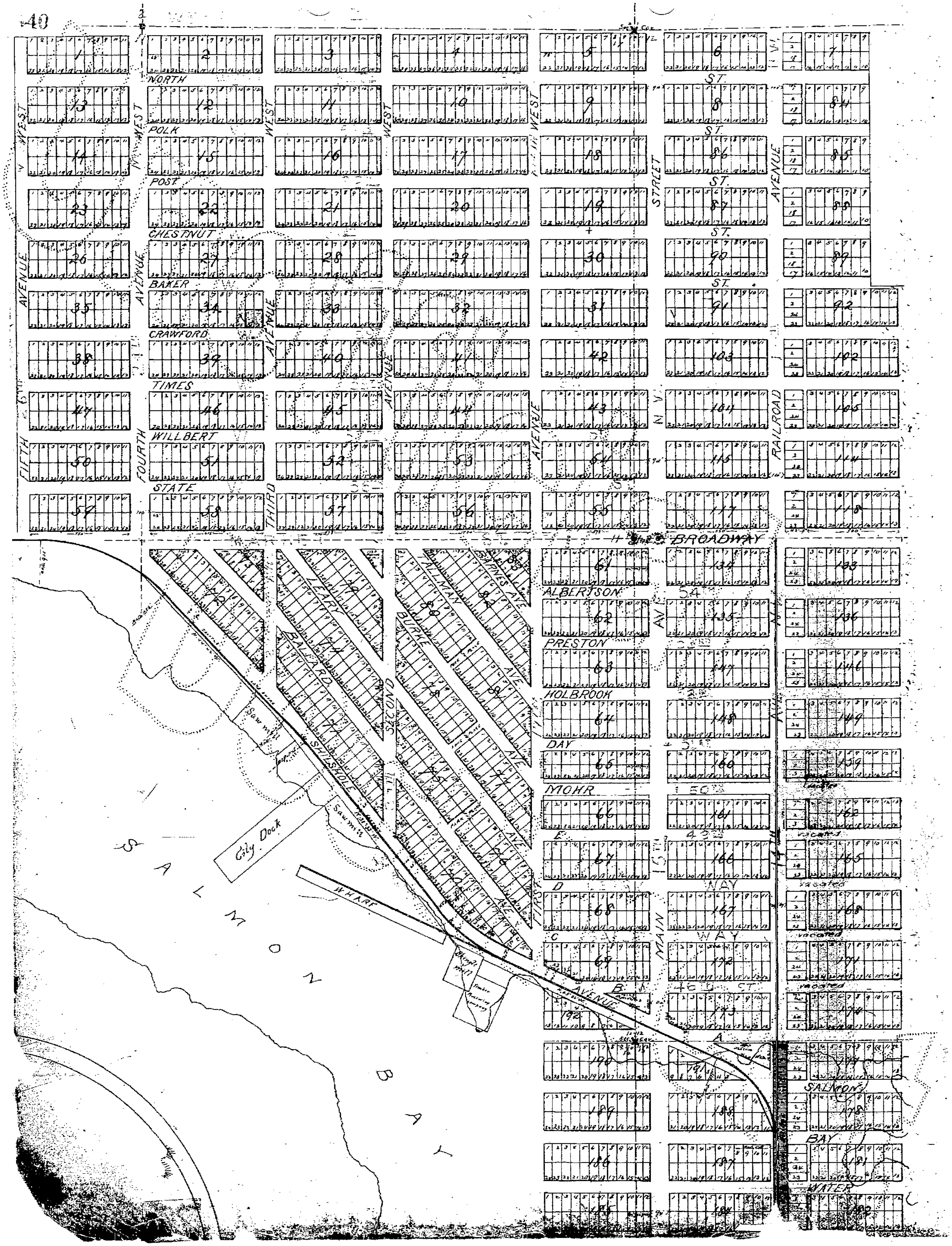
Territory of Washington } ss.
County of King }

On this 14th day of January A.D. 1889 before me, a notary public in and for Washington Territory, duly commissioned and sworn, personally came John Leary Prest of West Coast Improvement Co. and W.R. Ballard secretary. John Leary and Mary B. Leary, husband and wife, W.R. Ballard and Estelle Ballard, husband and wife, Wm Crawford and Mary Crawford, husband and wife, and Alonzo Hamblet, unmarried, all of King County Washington Terr., to me known to be the individuals described in and who executed the foregoing plat, and acknowledged that they signed and sealed the same as their free and voluntary act and for the uses and purposes therein mentioned.

Witness my hand and official seal, the day and year in this certificate above written.

NOTARIAL SEAL

George B. Kittinger
Notary Public in and for Washington Ter.


40
NORTH
POLK
POST
CHESTNUT
BAKER
CRAWFORD
TIMES
WILLBERT
STATE
ST.
BROADWAY
ALBERTSON
PRESTON
HOLBROOK
DAY
MOHR
E
D
C
WAY
B
A
ST.
SALMON
BAY
WATER
FIFTH AVENUE WEST
FOURTH AVENUE WEST
THIRD AVENUE WEST
AVENUE WEST
AVENUE
STREET
AVENUE
RAILROAD AVE
MAIN ST
FRONT
SECOND
LEARY
BALLARD
SHILSHOLE AVE
BURKE AVE
TALLMAN AVE
BARNES AVE
Saw mill
Saw mill
City Dock
WHARF
SALMON BAY
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185
184
182
vacated
vacated
vacated
vacated

1889

I

DEDICATION

Know all men by these presents: That the West Coast Improvement Company: John Leary, Mary B. Leary, W. R. Ballard, Estelle Ballard, Wm Crawford, Mary Crawford and Alonzo Hamblet, owners in fee simple of Gilman Park, to the City of Seattle hereby declare this plat and hereby dedicate to the use of the public forever all the Streets platted thereon, except all streets West of Railroad ave. and South of Shilshole ave. and excepting and reserving however the exclusive right of laying down water pipes and gas pipes through and under the streets of said plat and reserving also the exclusive rights for electric lights, street railways cable roads and steam or electric railways.

In witness whereof we have hereunto set our hands and seals this 14th day of January A.D. 1889.

Signed & Sealed in presence of

R. W. Groover

W. T. Sharpe

John Leary L.S.

Mary B. Leary L.S.

by John Leary her attorney in fact.

W. R. Ballard L.S.

Estelle Ballard L.S.

William Crawford L.S.

Mary Crawford L.S.

Alonzo Hamblet L.S.

Corporate Seal

West Coast Improvement Company

by John Leary President

W. R. Ballard Secretary

ACKNOWLEDGEMENT

Territory of Washington } ss.
County of King

On this 14th day of January A.D. 1889 before me, a notary public in and for Washington Territory, duly commissioned and sworn, personally came John Leary Prest of West Coast Improvement Co. and W. R. Ballard secretary. John Leary and Mary B. Leary, husband and wife, W. R. Ballard and Estelle Ballard, husband and wife, Wm Crawford and Mary Crawford, husband and wife, and Alonzo Hamblet, unmarried, All of King County Washington Terr., to me known to be the individuals described in and who executed the foregoing plat, and acknowledged that they signed and sealed the same as their free and voluntary act and for the uses and purposes therein mentioned.

Witness my hand and official seal, the day and year in this certificate above written.

Notarial Seal

George B. Kittinger

Notary Public in and for Washington Territory

APPENDIX E
Boring Logs

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	
Total Depth:	30
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	Gravel pavement		
1	50/2	17	33				SM	Damp, silty SAND, sand is fine-grained, trace fine gravel, light grayish-brown, no odor		
2 3 4	17 19 13 8	12	100				SP	Moist, SAND, fine-to medium-grained, trace fine gravel, light brown, no odor		
5	4 6 9 12	25	100				ML	Moist, SILT, low plasticity, brown, no odor		
6 7	10 18 16 13	9	100				SP	Moist, SAND, sand is fine-to medium-grained, trace coarse gravel, light brown, no odor		
8 9 10 11	10 7 12 12 5 5 2 4	5 3	75 75				SP	Wet, SAND, fine-to medium-grained, grayish-brown, no odor	▼	
							ML	Moist, clayey SILT, trace organics, medium plasticity, brown, no odor		
12 13	6 9 13 21	5	100				ML	Wet, sandy SILT with gravel, shell fragments 13'-13.5', trace organics, grayish-brown, no odor		
14 15	3 2						SW	Wet, SAND, fine-to coarse-grained, trace fine gravel, gray, no odor		

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 9/6/2006
Date Finished: 9/6/2006
Logged By: DMB
Chk By: TJC
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B06

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	
Total Depth:	30
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15	6 50/5	4	100		B-06-15.0		ML	Moist, clayey SILT, trace fine to coarse gravel, trace sand, medium plasticity, brown, no odor		
								Moist, ORGANICS, predominately wood debris, brown, no odor		
16										
17			75				OL			
18								Wet, SAND, fine-to medium-grained, "soupy" grayish-brown, strong odor (burnt wood)		
19	50/5	23	75		B-06-19.0		SP			
							ML	Wet, sandy SILT, low plasticity, grayish-brown, strong odor (burnt wood)		
20								Moist, clayey SILT, trace organics, clay and/or organic content decreasing with depth, high-plasticity becoming low, light gray, moderate odor (burnt wood)		
21	70 30 22 50/5	11	50				ML			
22								Wet, SAND with silt, fine-to medium-grained, some fine to coarse gravel, grayish-brown, moderate odor (burnt wood)		
23	22 50/4	4	50		B-06-23.0		SM			
24								Poor recovery, 3" of wet, ORGANICS, predominately wood debris, moderate odor (burnt wood)		
25	50/3	25	25				OL	moist, silty SAND, fine-to medium-grained, low plasticity, gray, slight to moderate odor (burnt wood)		
26								Wet, silty SAND, fine-to medium-grained, trace fine to coarse gravel, trace organics, "soupy" in places, slight odor (burnt wood)		
27	50 50 50/2	2	50							
28							SM			
29	33 50/4	1	50		B-06-29.0					
30										

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BORING LOG
B06

Log of Exploratory Boring:

Notes

Drilling Co./Driller: Holt Drilling
Drilling Method: HSA
Location:
Surface Condition:
Total Depth: 30
First GW Depth: 8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
30								Boring terminated at 30 feet below ground surface. Two-inch monitoring well MW-01 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 15' - 30' bgs.		
31										
32										
33										
34										
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36										
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40										
41										
42										
43										
44										
45										

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BORING LOG
B06

Log of Exploratory Boring:

Notes

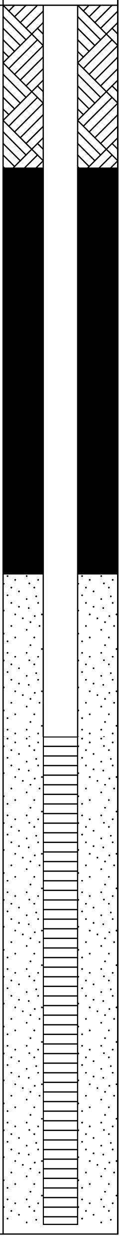
Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	29
First GW Depth:	14.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	Asphalt pavement		
1	25 25 25 36	<1	0				FILL	3" Recovery - crushed asphalt and subbase		
3	2 6 5 6	0 0	75				SM	Moist, silty SAND, fine-grained, light brown to brown, no odor		
5	3 3 6 10	0 0	100				ML	Moist, clayey SILT, some fine sand, moderate plasticity, brown, no odor		
							SM	Moist, SAND with silt, fine-to medium-grained, apparent Iron oxidation from 7.0'-8.25', light brown becoming gray at 8.25', no odor		
7	7 7 6 6	0 0	100							
9	3 2 50/4	0 0	50		B-07-10.5				▼	
							ML	Moist, sandy SILT, trace organics, cedar wood at 11 feet, low plasticity, gray, no odor		
11	16 5 5		34				OL	Moist, ORGANICS, wood debris similar to above, no odor		
	70 46 30 31	2 0	50							
							SM	Moist, gravelly SAND with silt, sand is fine-to coarse-grained, light gray, no odor		
							SP		▽	
15										



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BORING LOG
B07

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	29
First GW Depth:	14.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15 16	18 24 24 44	0 0	100				SP	Wet, SAND, fine-to medium-grained, trace coarse sand, coarsening with depth, gray to brown		
17 18	49 50/3	<1	67		B-07-17.5		SM	Wet, silty SAND, fine-grained, some medium to coarse sand, light brown becoming gray		
19 20	44 50/2	0	50							
21 22	45 50/3	0	50							
23	34 50/4	0	50				SM	Moist to wet, silty SAND, sand is fine-to medium-grained, gray, no odor		
24 25	33 50/5	0	50							
26 27	42 50/4	0	75				ML	Moist, SILT, low plasticity, gray, no odor		
28	3 3 50	0	67		B-07-29.0		ML	Moist, clayey SILT, moderate plasticity, gray, no odor		
29 30								Boring terminated at 29 feet below ground surface. Two-inch diameter monitoring well MW-02 installed as depicted above-right, using 2-inch		

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BORING LOG
B07

Log of Exploratory Boring:

Notes

Drilling Co./Driller: Holt Drilling
Drilling Method: HSA
Location:

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Surface Condition: Flushmount
Total Depth: 29
First GW Depth: 14.5

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
30								PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 9' - 24' bgs.		
31										
32										
33										
34										
35										
36										
37										
38										
39										
40										
41										
42										
43										
44										
45										

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BORING LOG
B07

Log of Exploratory Boring:

Notes

Asked driller why such poor recovery- driller says its because we are in hardpan glacial till.
Asked driller when he thought till was encountered- he says around 12'/13'

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	20
First GW Depth:	9.75

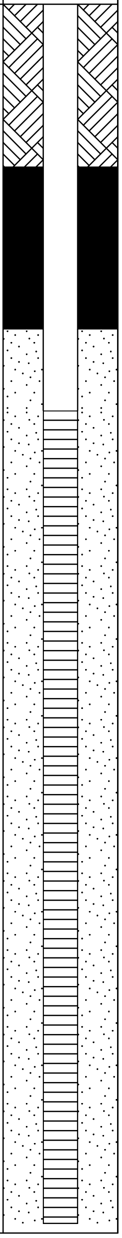
Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample ID	USCS Class	Description	Moisture Content
0					FILL	Asphalt and subbase	
1–3	6 9 26 26	0	50		FILL	Moist, crushed asphalt and subbase, black, mild odor at 3' (fresh asphalt)	▼
3					SP	Moist, SAND, fine-grained, gray, no odor	
3.5–5.5	1 1 1 1	0	100	B-08-4.0	PT	Wet, ORGANICS, predominately small apparent wood debris (splinter-size), black, no odor	
5.5–6	1 1 50/3	0	67				
6					ML	Wet, clayey SILT, moderate plasticity, greenish-gray, no odor	
6.5					OL	Wet, ORGANICS, predominately small apparent wood debris (splinter-size), black, no odor, no recovery from 6.5'-8.5'	
7.5	100/3		0				
9	22 12 19 26	0	100		SM	Wet, silty SAND, fine-to medium-grained, low plasticity, grayish-brown, no odor	▽
9.75					ML	Moist, clayey SILT, trace fine gravel, trace organics, low plasticity, greenish-gray, no odor	
10					SM	Wet, silty SAND, fine-to coarse-grained, grayish-brown, no odor, poor recovery 14'-18'	
11	13 26 25 50/6	0	75	B-08-11.5			
13		0	67				
15							

Well Detail



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BORING LOG
B08

Log of Exploratory Boring:

Notes
Asked driller why such poor recovery- driller says its because we are in hardpan glacial till.
Asked driller when he thought till was encountered- he says around 12'/13'

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	20
First GW Depth:	9.75

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15	50/5		0	☒				Wet, silty SAND, fine-to coarse-grained, grayish-brown, no odor, poor recovery 14'-18'		
16				☒						
17	50/5		0				SM			
18				☒						
	31 50/5		67							
19							ML	Moist, SILT, low plasticity, gray, no odor		
		<1			B-08-19.5					
20								Boring terminated at 20 feet below ground surface. Two-inch diameter monitoring well installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 5' - 20' bgs.		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B08

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Abandoned flush
Total Depth:	12
First GW Depth:	4.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	Asphalt and subbase		
1							FILL	Damp, crushed asphalt and subbase		
2	8 6 5 13	0	100					Moist, loose, silty SAND, sand is fine-grained, some medium sand, trace organics, black to dark grayish-brown, no odor		
3	5 2 2	0	33				SM			
4									∇	
5	1 1 2 4	0	100					Wet, silty SAND, with organics, trace fine to coarse gravel, "soupy", low plasticity, no odor		
6							SM			
7	4 5 9 10	0.4	33		B-09-7.5					
8										
9	6 9 50/5	0.5	100		B-09-9.5		ML	Moist, clayey SILT, trace organics, moderate plasticity, greenish-gray, no odor		
10							SM	Wet, SAND, fine-to coarse-grained, trace fine to coarse gravel, grayish-brown, no odor		
11	13 39 34 50/5	0.4	75							
12							SM	Wet, silty SAND, fine-grained, gray, no odor		
13								Boring terminated at 12 feet below ground surface. No monitoring well installed.		
14										
15										

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BORING LOG
B09

Log of Exploratory Boring:

Notes

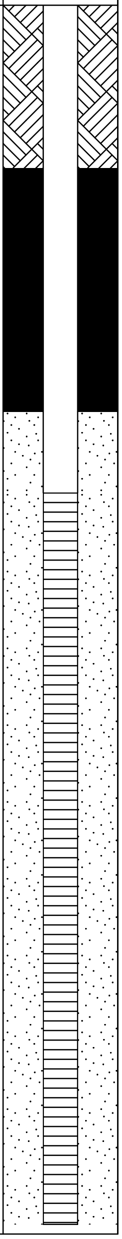
Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	16
First GW Depth:	3.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Gravel pavement		
1								Moist, SAND with silt, sand is fine-grained, trace fine gravel, orangish-brown, becoming grayish-brown, no odor		
2	13 7 5 5	<1	75				SM			
3									▽	
4	5 3 1 7	<1	100					Wet, SAND, fine-to medium-grained, 1-cm thick organic layer at 6.0' (wood chips and wood splinters), organic rich layer 7.75'-8.0' (containing shells), no odor	▼	
5										
6	4 5 3	<1	100		B-10-5.75		SP			
7	2 4 4 5	0	100							
8					B-10-8.5			Moist, clayey SILT, some organics, trace fine to coarse gravel, trace apparent red brick fragments from 8.5'-10.5', low plasticity, grayish mottling, no odor		
9	5 6 24 10	0	75							
10							ML			
11	3 4 10	<1	100							
12										
13	4 5 9 12	0	75					Moist, clayey SILT, moderate plasticity, greenish-gray, no odor		
14							ML			
15	6 8									



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BORING LOG
B10

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	16
First GW Depth:	3.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15	14 21	0	75	☒	B-10-15.0	▥	ML	Moist, clayey SILT, moderate plasticity, greenish-gray, no odor		░▤░
16								Boring terminated at 16 feet below ground surface. Two-inch diameter monitoring well MW-04 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 6' - 16' bgs.		
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B10

Log of Exploratory Boring:

Notes

Drilling Co./Driller: Holt Drilling
Drilling Method: HSA
Location:
Surface Condition: Flushmount
Total Depth: 20
First GW Depth: 8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample ID
1–3	24 19 13 10	0	75	
3–5	6 6 6 1	0	100	
5–6.5	6 8 6	0	100	
6.5–8	4 3 4	0	100	
8–9.5	6 7 7	0	100	
9.5–11	13 10 5	0	100	B-11-10.5
11–13	4 8 9 8	<1	75	
13–14.5	2 5 11	0	100	B-11-13.5

Depth (feet)	USCS Class	Description	Moisture Content
0–1	FILL	Gravel pavement	
1–2	SW	Damp, gravelly SAND, sand is predominately fine-grained, some medium to coarse-grained sand, some silt, brown, no odor	
2–8	SP	Moist, fine-grained SAND, trace fine to coarse gravel, light brown becoming brownish-gray, no odor	▼ ▽
8–11.75	SP	Wet, SAND, fine-to medium-grained, trace coarse-grained sand, organic rich layer at 10.25' (shells), brownish-gray becoming gray, no odor	
11.75–13	ML	Moist, clayey SILT with organics, some fine sand, trace fine gravel, 1.5" diameter wood fragment present, low plasticity, brownish-gray, no odor	
13–14	SP	Wet, SAND, fine-to medium-grained, gray, no odor	
14–14.5	ML	Moist, clayey SILT, soft, low plasticity, greenish-gray, no odor	
14.5–15	SM		

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BORING LOG
B11

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	20
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15	21 42 40 42	0	100					Wet, silty SAND, sand is fine-grained, trace clay, low plasticity, gray/orange mottling from 14.5'-16.5', brown-gray to gray, no odor		
16										
17	8 20 30 47	0					SM			
18										
19	30 2 50/5	0	67		B-11-20.0					
20								Boring terminated at 20 feet below ground surface. Two-inch diameter monitoring well MW-05 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 5' - 20' bgs.		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B11

Log of Exploratory Boring:

Notes

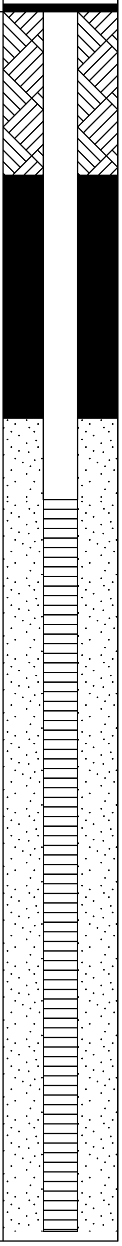
Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	16
First GW Depth:	8.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	Asphalt and subbase		
1 2	5 12 10 9	0.2	75		B-12-2.5		SM	Moist, silty SAND with gravel, sand is fine-grained, grayish-brown, black/greenish mottling around 3', no odor	▼	
3 4	2 3 6	<1	100		B-12-4.0		SM	Moist, clayey SAND, sand is fine-grained, some silt, trace fine gravel, low plasticity, brown, no odor		
5 6	27 33 26 39	<1	100				SM	Moist, SAND with silt, sand is fine-grained, trace fine gravel, brown-gray, orange mottling 6.5'-8.5', no odor		
7 8	19 26 25 50/3	0	100							
9	50/4	0	100				SM	Wet, SAND with silt, sand is fine-grained, "soupy" from 8.5'-10.0', no recovery 10'-14', brown-gray, no odor	▽	
10 11	50/2		0							
12 13	50/4		0							
14 15	25						SM	Wet, SAND with silt, sand is fine-grained, gray, no odor		



Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 9/8/2006
Date Finished: 9/8/2006
Logged By: DMB
Chk By: TJC
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B12

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	HSA
Location:	
Surface Condition:	Flushmount
Total Depth:	16
First GW Depth:	8.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15	50/1	0	50	☒	B-12-16.0	▨	SM	Wet, SAND with silt, sand is fine-grained, gray, no odor		▨
16								Boring terminated at 16 feet below ground surface. Two-inch diameter monitoring well MW-06 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 6' - 16' bgs.		
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B12

Page 2 of 2

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	10
First GW Depth:	

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	6" concrete		
							FILL	Crushed rock subbase		
1								Moist, silty SAND, sand is predominately fine-grained, trace fine gravel, trace medium-grained sand, light brown becoming dark brown, no odor		
2		1			B-13-2.0					
			80							
3										
4										
		1			B-13-4.5					
5										
							SM			
6										
7		<1			B-13-7.0					
			100							
8										
9										
		<1			B-13-9.5					
10								Boring terminated at 10 feet below ground surface (refusal). No monitoring well installed.		
11										
12										
13										
14										
15										

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BORING LOG
B13

Page 1 of 1

Log of Exploratory Boring:

Notes
PID inoperable at time of boring (pump failure), readings 9/12/06.

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	10
First GW Depth:	

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	4" Concrete		
1							FILL	Damp, pulverized concrete and subbase overlaying 6" damp becoming moist, crushed brick, no odor		
2		183			B-14-2.0			Moist, SAND, fine-grained, dark gray with apparent black staining around 1.5', no odor		
							SP			
3			67							
4		11.6			B-14-4.0		SM	Moist, SAND with silt, sand is fine-grained, trace vitreous black wood fragments, low plasticity, gray, no odor		
							OL	Moist, ORGANICS (wood debris), no odor		
5								Moist, SILT, trace fine gravel and fine-grained sand, low plasticity, gray-brown, no odor		
6		331			B-14-6.0					
7										
			60				ML			
8										
9		48.1			B-14-9.0					
10								Boring terminated at 10 feet below ground surface (refusal). No monitoring well installed.		
11										
12										
13										
14										
15										

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BORING LOG
B14

Log of Exploratory Boring:

Notes
PID inoperable at time of boring (pump failure), readings 9/12/06.

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	9
First GW Depth:	

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	5" Concrete		
								Damp, pulverized concrete and subbase, light gray, no odor		
1							FILL			
2								Moist, silty SAND, sand fine-to medium-grained, trace fine gravel, gray to gray-brown, no odor		
			80							
3		0			B-15-3.0					
							SM			
4										
		0			B-15-4.5					
5								Moist, silty SAND, sand fine-to medium-grained, trace fine gravel, gray-brown, no odor		
6										
		162			B-15-6.5		SM			
7			75							
								Moist, sandy SILT, sand is fine-grained, low plasticity, gray, no odor		
8							ML			
					B-15-8.5					
9										
								Boring terminated at 9.0 feet below ground surface (refusal). No monitoring well installed.		
10										
11										
12										
13										
14										
15										

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BORING LOG
B15

Log of Exploratory Boring:

Notes
PID inoperable at time of boring (pump failure), readings 9/12/06.

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	12
First GW Depth:	1

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								5" Concrete		
1								Wet, gravelly SAND, sand is fine-to coarse-grained, "soupy," light gray becoming black, moderate odor (indeterminate)	▽	
2							SW			
		1032	45		B-16-2.5					
3										
4										
		111			B-16-4.5		ML	Moist, clayey SILT, soft, low plasticity, black becoming greenish-gray, mild odor		
5								Moist, silty SAND, fine-to medium-grained, trace fine to coarse gravel, gray, slight odor		
6										
7		179			B-16-7.0					
			100				SM			
8										
9		182			B-16-9.0					
10								Moist, silty SAND, sand fine-grained, low plasticity, gray, slight odor		
11			100				SM			
		648			B-16-11.5					
12								Boring terminated at 10 feet below ground surface (refusal). No monitoring well installed.		
13										
14										
15										

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BORING LOG
B16

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Flushmount
Total Depth:	25
First GW Depth:	10

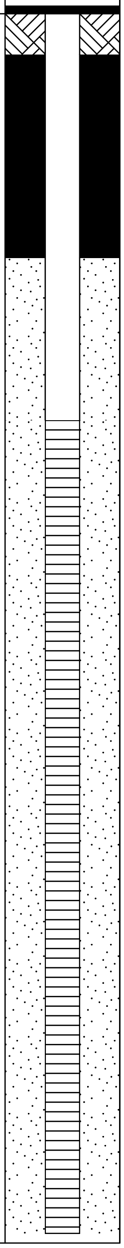
Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content
0–1								Topsoil	
1–5.5		0	50	1–5	B-17-4.0		SM	Moist, silty SAND, sand is predominately fine-grained, some medium sand, trace fine gravel, brown becoming orangish-brown around 5.5', no odor	
5.5–7.5		0	60	5–10	B-17-7.0		SP	Moist, SAND, fine-grained, light brown, no odor	
7.5–10		0			B-17-9.0		SM	Moist, silty SAND, sand is fine-to medium-grained, gray, no odor	▼
10–13			40	10–15			SM	Wet, gravelly SAND with silt, fine to coarse gravel, sand is fine-to coarse-grained, gray, no odor	▽
13–14		0			B-17-13.5		SM	Moist, clayey SAND, fine-grained, low plasticity, gray, no odor	
14–15							ML	Moist, clayey SILT, some organics, low plasticity, gray, no odor	

Well Detail



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BORING LOG
B17

Log of Exploratory Boring:

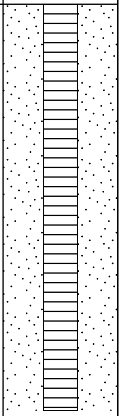
Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Flushmount
Total Depth:	25
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Moist, clayey SILT, some organics, low plasticity, gray, no odor		
16		0			B-17-16.0		ML			
17			100					Wet, SAND, fine-to medium-grained, some gravel and coarse sand, gray, no odor		
18		0			B-17-18.5		SW			
19										
20								Moist, silty SAND, fine-grained, trace fine to coarse gravel, low plasticity, gray, no odor		
21										
22			0				SM			
23										
24		0			B-17-25					
25								Boring terminated at 25 feet below ground surface. Monitoring well MW-07 installed as depicted above-right, using 1.5-inch diameter PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slot screen 5' - 20' bgs. Formation cave-in from 20' - 25'.		
26										
27										
28										
29										
30										

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BORING LOG
B17

Page 2 of 2

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	20
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	4" Concrete		
1							FILL	Damp, pulverized concrete and subbase		
2								Moist, SAND, fine-to medium-grained, brown becoming black (possible staining), slight odor (indeterminate)		
3			45		B-18-3.0		SP			
4							ML	Moist, clayey SILT, some fine to coarse gravel, some organics, some brick fragments, moderate plasticity, brownish-gray, no odor		
5					B-18-5.0			Moist, clayey SILT, some sand, black vitreous wood fragments 5'-5.25', moderate plasticity, slight asphalt-type odor		
6							ML			
7			80		B-18-7.0			Moist, silty SAND, fine-grained, low plasticity, light brown, slight odor		
8							SM			
9					B-18-9.0					
10								Wet, silty SAND, fine-grained, trace fine gravel, low plasticity, gray, no odor	▽	
11										
12			80		B-18-12.5		SM			
13										
14										
15										

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BORING LOG
B18

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	20
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15							SP	Moist, SAND, fine-to medium-grained, dark gray, slight odor		
16								Moist, SILT, some fine sand, low plasticity, gray, no odor		
17			60							
18							ML			
19					B-18-19.5					
20								Boring terminated at 20 feet below ground surface. No monitoring well installed.		
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B18

Log of Exploratory Boring:

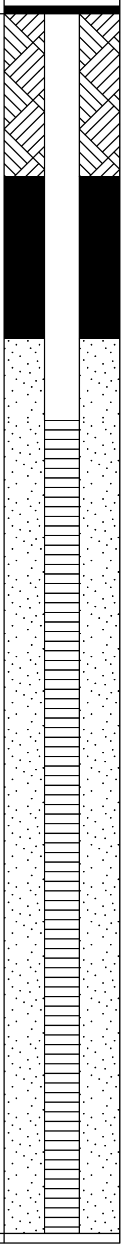
Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Flushmount
Total Depth:	15
First GW Depth:	14

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	6" Concrete Damp, pulverized concrete and subbase		
1							FILL		▼	
2			55				FILL	Potential former asphalt layer and subbase		
3								Potential creosote residue with wood debris and thick black tar		
4							FILL			
5								Moist, clayey SILT, low plasticity, dark gray with orange-gray mottling, moderate creosote odor		
6					B-19-6.0		ML			
7			100					Moist, silty SAND, fine-grained, trace fine to coarse gravel, light grayish-brown, slight creosote odor		
8					B-19-8.0					
9										
10							SM			
11					B-19-11.5					
12			100							
13										
14					B-19-14.0 B-19-15.0		SM	Wet, silty SAND, fine-to medium-grained, gray, slight creosote odor	▽	
15										

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BORING LOG
B19

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Flushmount
Total Depth:	15
First GW Depth:	14

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Boring terminated at 15 feet below ground surface. Monitoring well MW-08 installed as depicted above-right, using 1.5-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slot screen 5' - 15' bgs.		
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B19

Log of Exploratory Boring:

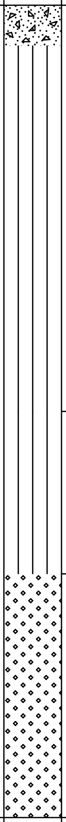
Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	10
First GW Depth:	7

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling



Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								4" concrete		
1								Poor recovery, 10" pulverized concrete overlaying 3" moist, clayey SILT, low plasticity, black, slight odor (indeterminate)		
2										
3		480	22				ML			
4										
5		280			B-20-5.0			Moist, clayey SILT, oily texture, low plasticity, greenish-gray with black staining near top, slight odor as above		
6							ML			
7		207			B-20-7.0				∇	
			89					Wet, SAND, fine-to coarse grained, trace fine to coarse gravel, gray, slight odor as above		
8										
							SW			
9										
		140			B-20-9.5					
10								Boring terminated at 10 feet below ground surface. No monitoring well installed		
11										
12										
13										
14										
15										

SOUND ENVIRONMENTAL STRATEGIES
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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 9/12/2006
Date Finished: 9/12/2006
Logged By: DMB
Chk By: TJC
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B20

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Holt Drilling
Drilling Method:	Direct Push
Location:	
Surface Condition:	Abandoned flush
Total Depth:	5
First GW Depth:	

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	5" concrete		
1 2							FILL	Damp, pulverized concrete and subbase		
3 4		160	78		B-21-4.5		ML	Moist, clayey SILT, apparent crushed asphalt layer 2.5'-3.0', low plasticity, black becoming mottled (orange/gray), slight odor (indeterminate)		
5 6 7 8 9 10 11 12 13 14 15								Boring terminated at 5 feet below ground surface. No monitoring well installed.		

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BORING LOG
B21

Log of Exploratory Boring:

Notes
Samples collected using direct-push and over-drilled using hollow-stem auger.

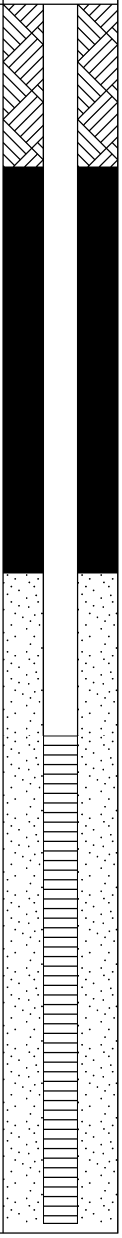
Drilling Co./Driller:	ESN
Drilling Method:	Direct Push/Hollow-stem auger
Location:	
Surface Condition:	Flushmount
Total Depth:	24
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0										
	8 6 6	0.0	67		B-22-0.5		SM	Moist, gravelly SAND with silt, sand is predominately fine-grained, gravel is fine, apparent iron oxidation in places, dark brown, no odor (possible slag material)		
1					B-22-1.5			Moist, silty SAND, fine-grained, dark brown, no odor		
2										
					B-22-2.5			Trace fine gravel 2-4', fine grayish material 2.5-3.0' (possible Cement Kiln Dust), crushed red brick at 4' (Fill)		
3		0.0	75		B-22-3.0					
4										
								Moist, silty SAND, fine-grained, trace fine gravel, iron oxidation throughout, light brown, no odor		
5		0.0			B-22-5.0					
6			100				SM			
7		0.0			B-22-7.0			Becoming gray at 6.5', some organics (wood fragments) near 8 feet.		
8									▽	
9		0.0			B-22-9.0			Wet, silty SAND, fine-grained, shell fragments at 10.5', wood fragments present 9-9.5', dark gray, no odor		
10			100							
11		0.0			B-22-11.0					
							OL	Organic SILT, low plasticity, light gray to brown, wood fragments present, no odor		
12								Wet, silty SAND, fine-grained, dark gray, no odor		
13							SM			
14		0.0	50		B-22-14.0					
							OL	Wet, ORGANICS with sand, sand is predominately fine-grained, wood fragments, trace brick fragments, brown, no odor (Fill)		
15										



Former Wesmar Property
1401 & 1451 Northwest 46th Street
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BORING LOG
B22

Log of Exploratory Boring:

Notes
Samples collected using direct-push and over-drilled using hollow-stem auger.

Drilling Co./Driller: ESN
Drilling Method: Direct Push/Hollow-stem auger
Location:
Surface Condition: Flushmount
Total Depth: 24
First GW Depth: 8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15							ML	Wet, SILT, moderate plasticity, light gray, no odor		
16							ML	Becomes greenish-gray, high plasticity, no odor		
17										
18			63		B-22-18.0					
19							ML	Wet, sandy SILT, fine-grained, light gray, no odor		
20								Note: sample extricated from liner and retrieved, no sample collected due to concerns regarding sample integrity		
21										
22			25							
23										
24								Boring terminated at 24 feet below ground surface. Two-inch monitoring well MW-09 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 9' - 24' bgs. Water level in well rises to ground surface.		
25										
26										
27										
28										
29										
30										

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BORING LOG
B22

Log of Exploratory Boring:

Notes
Samples collected using direct-push and over-drilled using hollow-stem auger.

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push/Hollow-stem auger
Location:	
Surface Condition:	Abandoned flush
Total Depth:	12
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							GP	Moist, GRAVEL (crushed rock), light gray, no odor		
1					B-23-1.0			Moist, sandy GRAVEL with silt, gravel is fine to coarse, sand is fine-to coarse-grained, reddish-brown, no odor		
2		0.0	75		B-23-2.0		GM			
3					B-23-3.5			Wet, SILT with sand and gravel, gravel is fine, sand is predominately fine-grained, low plasticity, light gray, no odor		
4										
5					B-23-5.0		ML			
6		0.0	75							
7					B-23-7.0					
8								Wet, gravelly SAND with silt, sand predominately medium-grained, some fine and coarse sand, gravel is fine to coarse, no odor	▽	
9					B-23-9.0		SM			
10		0.0	100					Wet, silty SAND with gravel, sand is predominately fine-grained, gravel is fine to coarse, gray, no odor		
11					B-23-11.0		SM			
12								Boring terminated at 12 feet. No monitoring well installed.		
13										
14										
15										

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BORING LOG
B23

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Log of Exploratory Boring:

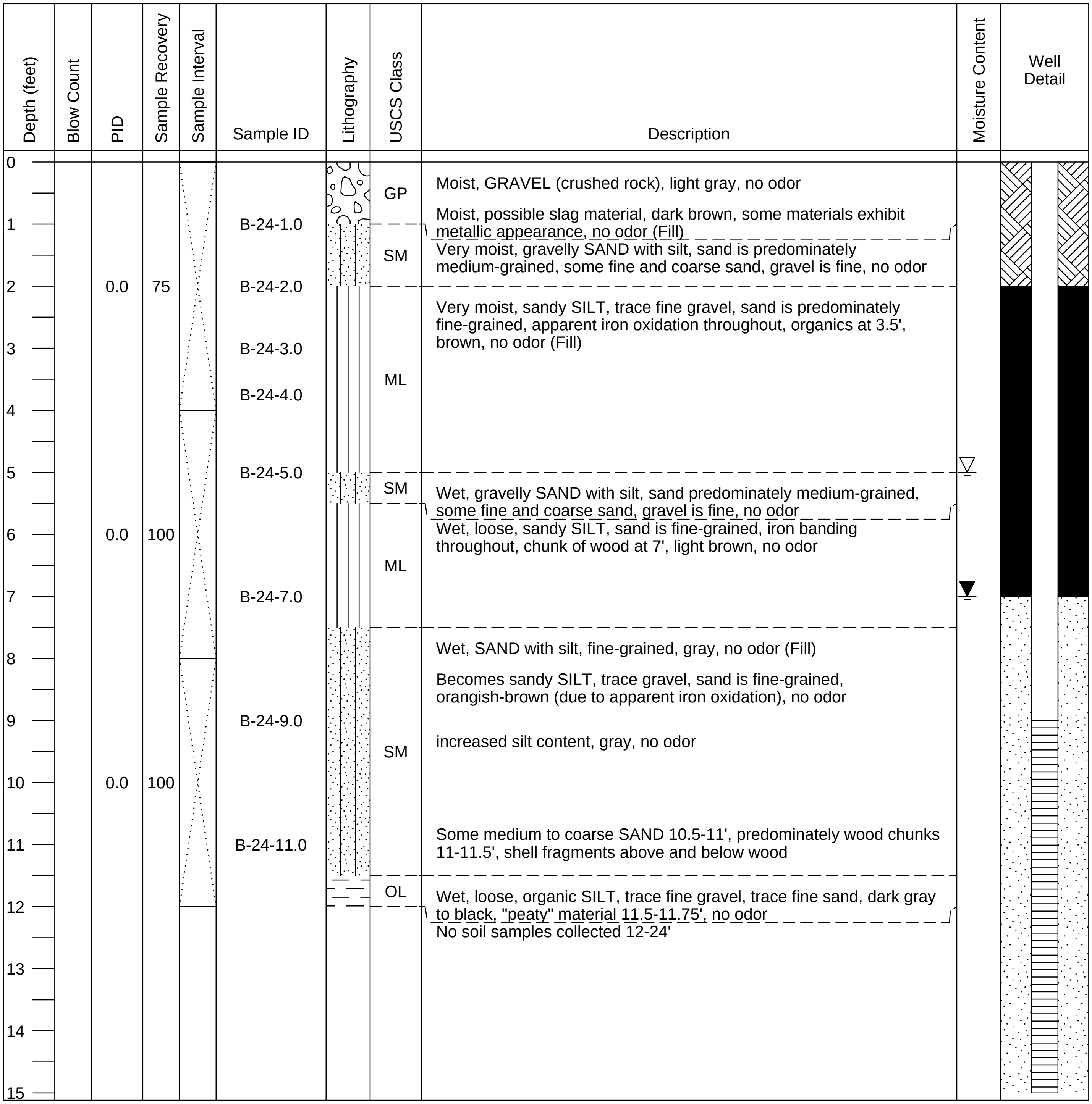
Notes
Samples collected using direct-push and over-drilled using hollow-stem auger.

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push/Hollow-stem auger
Location:	
Surface Condition:	Flushmount
Total Depth:	24
First GW Depth:	5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling



Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							GP	Moist, GRAVEL (crushed rock), light gray, no odor Moist, possible slag material, dark brown, some materials exhibit metallic appearance, no odor (Fill)		
1					B-24-1.0		SM	Very moist, gravelly SAND with silt, sand is predominately medium-grained, some fine and coarse sand, gravel is fine, no odor		
2		0.0	75		B-24-2.0		ML	Very moist, sandy SILT, trace fine gravel, sand is predominately fine-grained, apparent iron oxidation throughout, organics at 3.5', brown, no odor (Fill)		
3					B-24-3.0 B-24-4.0					
4										
5					B-24-5.0		SM	Wet, gravelly SAND with silt, sand predominately medium-grained, some fine and coarse sand, gravel is fine, no odor	▽	
6		0.0	100				ML	Wet, loose, sandy SILT, sand is fine-grained, iron banding throughout, chunk of wood at 7', light brown, no odor		
7					B-24-7.0				▼	
8							SM	Wet, SAND with silt, fine-grained, gray, no odor (Fill) Becomes sandy SILT, trace gravel, sand is fine-grained, orangish-brown (due to apparent iron oxidation), no odor		
9					B-24-9.0			increased silt content, gray, no odor		
10		0.0	100							
11					B-24-11.0			Some medium to coarse SAND 10.5-11', predominately wood chunks 11-11.5', shell fragments above and below wood		
12							OL	Wet, loose, organic SILT, trace fine gravel, trace fine sand, dark gray to black, "peaty" material 11.5-11.75', no odor No soil samples collected 12-24'		
13										
14										
15										

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BORING LOG
B24

Log of Exploratory Boring:

Notes

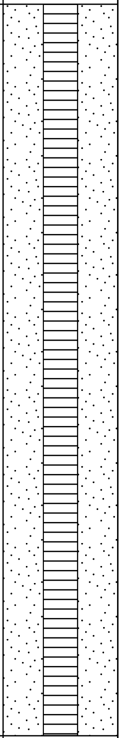
Samples collected using direct-push and over-drilled using hollow-stem auger.

Drilling Co./Driller: ESN
Drilling Method: Direct Push/Hollow-stem auger
Location:
Surface Condition: Flushmount
Total Depth: 24
First GW Depth: 5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								No soil samples collected 12-24'		
16										
17										
18										
19										
20										
21										
22										
23										
24								Boring terminated at 24 feet below ground surface. Two-inch monitoring well MW-10 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 9' - 24' bgs.		
25										
26										
27										
28										
29										
30										

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BORING LOG
B24

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Log of Exploratory Boring:

Notes
Grass Terrace; Samples collected using direct-push and over-drilled using hollow-stem auger.

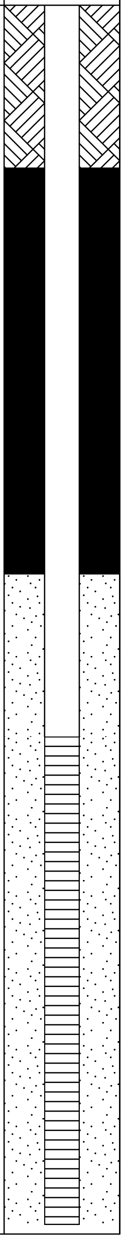
Drilling Co./Driller:	ESN
Drilling Method:	Direct Push/Hollow-stem auger
Location:	
Surface Condition:	Flushmount
Total Depth:	24
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							SW	Moist, gravelly SAND with silt, trace organics (rootlets), sand is predominately fine-to medium-grained, gravel is fine, reddish-brown, no odor		
1					B-25-1.0			Moist, silty SAND with gravel, sand predominately fine-grained, gravel fine to coarse, iron oxidation in places, light brown, no odor		
2		0.0	75				SM			
3					B-25-3.0					
4								Moist, SILT with sand and gravel, sand is fine-grained, gravel is fine, low plasticity, brown, no odor		
5					B-25-5.0		ML			
6		0.0	75					Reddish wood fragments at 5.5' Moist, silty SAND, sand is fine-grained, light brown, no odor		
7					B-25-7.0				▼	
8								Increasing silt content, gray, no odor Wet, silty SAND, sand is fine-grained, gray, no odor	▽	
9					B-25-9.0		SM			
10		0.0	100							
11					B-25-11.0			Organics at 11', SAND with some shell fragments 11-11.25', fine-grained, gray		
							OL	Wet, organic SILT, low plasticity, ranging from black to grayish-brown, "peaty" 11.25-11.5', no odor		
12								No samples collected 12' - 20'		
13										
14										
15										



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BORING LOG
B25

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Log of Exploratory Boring:

Notes
Grass Terrace; Samples collected using direct-push and over-drilled using hollow-stem auger.

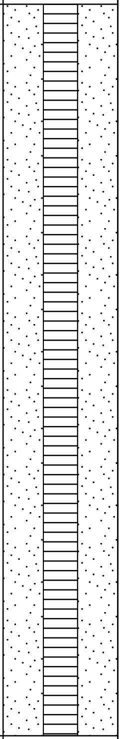
Drilling Co./Driller: ESN
Drilling Method: Direct Push/Hollow-stem auger
Location:
Surface Condition: Flushmount
Total Depth: 24
First GW Depth: 8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								No samples collected 12' - 20'		
16										
17										
18										
19										
20								Wet, SILT, trace fine SAND, low plasticity, gray, no odor		
21										
22		0.0	100				ML			
23					B-25-24.0					
24								Boring terminated at 24 feet below ground surface. Two-inch monitoring well MW-11 installed as depicted above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 9' - 24' bgs.		
25										
26										
27										
28										
29										
30										



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BORING LOG
B25

Log of Exploratory Boring:

Notes

Drilling Co./Driller: ESN
Drilling Method: Direct Push LAR
Location: 39' N and 45' W of the SE corner of the property.

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Surface Condition: Asphalt
Total Depth: 16.4
First GW Depth: 4

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0										
								Damp, silty SAND with trace gravel, dark brown, no odor. (Fill) Crushed asphalt.		
1										
2			90							
3		1.4								
								Moist, SAND with some silt, brown, no odor. (Fill) Grayish-brown.		
4								Gray. Wet, shell fragments, dark gray.	▽	
		0.2								
5										
							FILL			
6		1.1	90		B26-06					
7										
8										
9		0.3						Wet, SILT, moderate plasticity, dark brownish-gray, no odor. (Fill) Wood debris, no odor. (Fill) Wet, SILT, moderate plasticity, dark brownish-gray, no odor. (Fill)		
10			90							
								Crushed asphalt and silt, no odor, heavy sheen. (Fill)		
11		0.7			B26-11			Crushed brick debris.		
								Wet, fine- to medium-grained SAND with silt, dark gray, no odor. (Native)		
12										
13							SM			
14		0.7	100							
							ML	Clayey SILT lens, organic, black (OL).		
15										

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/19/2007
Date Finished: 11/19/2007
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BORING LOG
B26

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push LAR
Location:	39' N and 45' W of the SE corner of the property.
Surface Condition:	Asphalt
Total Depth:	16.4
First GW Depth:	4

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15 16		0.9	10		B26-16		ML	Moist, dense, stiff, clayey SILT, highly cohesive, greenish-gray, no odor. (Native)		
17								Boring terminated at 16.4 feet below ground surface due to refusal. Boring backfilled with bentonite and finished flush to the surface with asphalt.		
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B26

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-12.

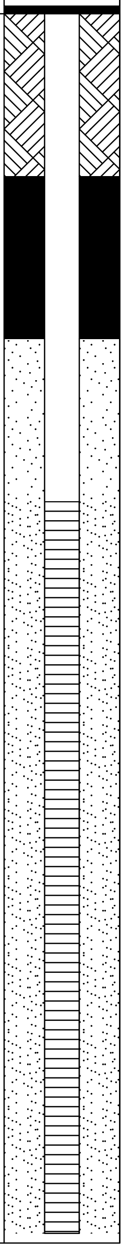
Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	204' N and 108' W of the SE corner of the property.
Surface Condition:	Asphalt
Total Depth:	28
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Damp to moist, medium dense, silty fine- to medium-grained SAND with gravel, brown, no odor. (Fill) Asphalt.		
1										
2		0.2	75							
3		0.0								
4					B27-04					
5										
		0.0								
6			75							
7							FILL			
		0.0						Damp, medium dense, sandy gravelly SILT, brown, no odor. (Fill)		
8								Damp, medium dense, fine- to medium-grained SAND with silt, brown, no odor. (Fill) Wet, gray at 8.0 feet below ground surface.	▽	
9										
10			90							
		0.0						Wood fragments. (Fill) Moist, soft to hard, SILT, trace sand, gray to brown, no odor. (Fill)		
11										
12					B27-12			No recovery.		
13										
14			70							
		0.0					ML	Damp, hard, sandy SILT with gravel, grayish-brown, no odor. (Native)		
15										



Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/19/2007
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Logged By: CSD
Chk By: DMB
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BORING LOG
B27

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-12.

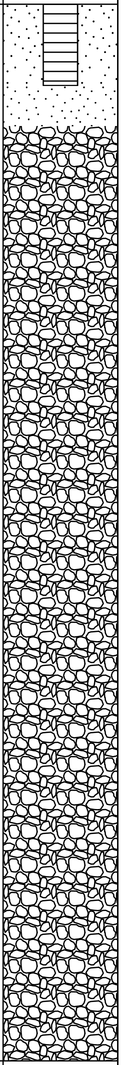
Drilling Co./Driller: ESN
Drilling Method: Combo Rig
Location: 204' N and 108' W of the SE corner of the property.
Surface Condition: Asphalt
Total Depth: 28
First GW Depth: 8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15							ML	Damp, hard, sandy SILT with gravel, grayish-brown, no odor. (Native)		
16							SM	Moist, dense, gravelly silty SAND, olive gray, no odor. (Native)		
17										
18			50							
19		1.9			B27-19					
20										
21										
22			70							
23		3.9								
24										
25								Wet, dense, silty SAND with gravel, olive gray, no odor.		
26			100							
27		5.0					ML	Damp, hard, sandy SILT, olive gray, no odor. (Native)		
							SP	Moist, dense, fine- to medium-grained SAND with silt, olive gray, no odor. (Native)		
28		6.3						Boring terminated at 28 feet below ground surface due to refusal. Two-inch diameter monitoring well MW-12 installed as illustrated above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 6' - 16' bgs.		
29										
30										



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BORING LOG
B27

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push LAR
Location:	171' N and 45' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	12
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0						▨		Crushed concrete. (Fill) Damp, fine- to medium-grained SAND, trace silt and gravel, brown, no odor. (Fill)		
1						▨		Damp, silty SAND, dark brown, no odor. (Fill)		
2			75			▨		Damp to moist, fine-grained SAND, trace silt, grayish-brown, no odor. (Fill)		
3		0.4				▨				
4						▨	FILL	Moist. Wet, SAND, trace silt, dark gray, no odor.		
5						▨				
6		1.1	75			▨				
7					B28-07	▨		Crushed asphalt. (Fill) Moist, clayey SILT, soft, low plasticity, moderately cohesive, black, no odor. (Fill)		
8		1.8				▨		Wood debris. (Fill) Wet, fine- to medium-grained SAND, trace silt, brownish-gray, no odor. (Fill)	▽	
9						▥		Wood debris. (Fill) Moist to wet, hard, clayey SILT, highly cohesive, greenish-gray, no odor. (Native)		
10			100			▥	ML			
11						▥				
12		1.4			B28-12			Boring terminated at 12 feet below ground surface due to refusal. Boring backfilled with bentonite and finished flush to the surface with cement.		
13										
14										
15										

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BORING LOG
B28

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push LAR
Location:	77' N and 45' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	11.5
First GW Depth:	4.35

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0						▨		Concrete. (Fill) Damp, SAND, trace silt, brownish-red, no odor. (Fill)		
1						▨		Damp, silty SAND, trace gravel, dark brown, no odor. (Fill)		
2			90			▨				
3		0.6			B29-03	▨		Wood debris. (Fill) Moist, SAND, trace silt, brownish-gray, no odor. (Fill)		
4						▨		Wet, dark gray.	▽	
5						▨	FILL			
6		1.5	100		B29-06	▨				
7						▨		Shell fragments.		
8						▨				
9			87.5			▨				
10						▨				
11		1.2			B29-11.5		ML	Wood fragments. (Fill) Moist to wet, hard, clayey SILT, highly cohesive, greenish-gray, no odor. (Native) Boring terminated at 11.5 feet below ground surface due to refusal. Boring backfilled with bentonite and finished flush to the surface with cement.		
12										
13										
14										
15										

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BORING LOG
B29

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	206' N and 191' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	30
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Crushed concrete. (Fill)		
1								Damp to moist, silty fine- to medium-grained SAND, some fine gravel, trace organics, grayish-brown, no odor. (Fill)		
2			65		B30-02					
		0.9								
3										
4		0.6						Moist, no organics.		
5										
6			75					Moist, medium dense, sandy SILT, trace gravel, brownish-gray, no odor. (Fill)		
							FILL			
7		0.7			B30-07					
8								Wet.	∇	
								Wet, loose, fine- to medium-grained SAND, trace silt, dark gray, no odor. (Fill)		
9										
			100							
10		1.9								
11								Moist to wet, soft, clayey SILT, gray, no odor. (Fill) Crushed asphalt and wood debris, no odor. (Fill) No recovery, sampler stuck in liner, sample collected from soil knocked from sampler, fill/native interface inferred. .		
12										
13		1.7	0		B30-13					
14										
							SM			
15								Moist, dense, silt fine- to medium-grained SAND, gray, no odor. (Native)		
16										

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BORING LOG
B30

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	206' N and 191' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	30
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
16										
			100					Moist, dense, silt fine- to medium-grained SAND, gray, no odor. (Native)		
17		1.5								
18										
								Moist to wet.		
19										
			100							
20		1.8								
21										
								Few gravel, dark gray.		
22										
			100							
23		1.8					SM			
24										
25										
			70							
26		1.8								
27										
28										
			50							
29										
30		2.4								
								Boring terminated at 30 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
31										
32										

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BORING LOG
B30

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	205' N and 240' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Crushed concrete. (Fill) Damp to moist, silty fine- to medium-grained SAND with some gravel, grayish-brown, no odor. (Fill)		
1										
2		1.7	35							
3										
4		2.0			B31-04			Moist.		
5							FILL			
6			70							
7		2.4						Moist, sandy SILT with some gravel, brownish-gray, no odor. (Fill)		
8								Wet, brown.	∇	
9								Wet, fine- to medium-grained SAND, trace silt, dark gray, no odor. (Fill)		
10			100							
11								Wet, soft, SILT, trace sand, light-gray, no odor. (Fill)		
		1.7			B31-11.5			Moist, dense, hard, SILT, trace wood fragments, greenish-gray, no odor. (Native)		
12							ML	No wood fragments.		
13			100							
14		2.2			B31-14		SM	Moist to wet, medium dense, silty SAND, gray, no odor. (Native)		
15										

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BORING LOG
B31

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	205' N and 240' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Moist to wet, medium dense, silty SAND, gray, no odor. (Native) Wet.		
16			50				SM			
17								Silt lens.		
18		1.5						Boring terminated at 18 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B31

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	205' N and 357' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	19
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels

▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Crushed concrete. (Fill) Damp to moist, silty fine- to medium-grained SAND, some gravel, grayish-brown, no odor. (Fill)		
1										
2		1.7	75		B32-02					
3										
4		1.6						Silt lens. Moist.		
5										
6			90				FILL			
7		2.1								
8								Wet.	▽	
9								Wood debris. (Fill) Wet, loose, fine- to medium-grained SAND, trace silt, dark gray, no odor. (Fill)		
10			100							
11		1.7			B32-11			Moist, hard, SILT, greenish-gray, no odor. (Fill)		
12								Wood debris, no odor. (Fill)		
							SP	Wet, loose, fine- to medium-grained SAND, trace silt, dark gray, no odor. (Native)		
13										
14			95				ML	Wet, dense, sandy SILT, gray, no odor. (Native)		
15							SP-SM	Wet, dense, SAND with some silt, brown, no odor. (Native)		

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BORING LOG
B32

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	205' N and 357' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	19
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15		1.9			B32-15		SP-SM			
							ML	Wet, dense, sandy SILT with some gravel, brown, no odor. (Native)		
16								Moist, dense, silty SAND, trace gravel, dark gray, no odor. (Native)		
17			100				SM			
18										
19		1.5								
								Boring terminated at 19 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B32

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	9' N and 35' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0				☒		▨		Gravel. (Fill) Damp to moist, medium dense, silty fine- to medium-grained SAND, few gravel, brown, no odor. (Fill)		
1		2.0			B33-01					
2			85					Trace brick fragments.		
3										
4				☒				Asphalt debris.		
5		2.2						Pea gravel. (Fill) Moist to wet, medium dense, silty fine- to medium-grained SAND, dark gray, no odor. (Fill)		
6			75				FILL			
7										
8				☒				Wet.	▽	
9		2.4			B33-09					
10			75					Wood debris, no odor. (Fill) Wet, soft, SILT, gray, no odor. (Fill)		
11										
12				☒		▥		Brick fragments. Wood debris, no odor. (Fill) Dense, hard, SILT, some sand, greenish-gray, no odor. (Native)		
13										
14			45				ML			
15										

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BORING LOG
B33

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	9' N and 35' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Dense, hard, SILT, some sand, greenish-gray, no odor. (Native)		
16		2.2			B33-16					
17							ML			
			90							
18										
19								Moist to wet, dense, silty SAND, trace gravel, gray, no odor. (Native)		
20										
			100				SM			
21										
22								Boring terminated at 22 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B33

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	3' N and 123' W of the SE corner of the property.
Surface Condition:	Asphalt
Total Depth:	22
First GW Depth:	6

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Crushed asphalt. (Fill) Damp to moist, loose to medium dense, silty fine- to medium-grained SAND, trace gravel, brown, no odor. (Fill)		
1										
2		2.0	85							
3										
4								Moist, medium dense, fine- to medium-grained SAND, some silt, brown, no odor. (Fill)		
5		2.2			B34-05					
6			100					Wet, dark gray.	▽	
7							FILL			
8										
9		1.9			B34-09					
10			100					Wet, soft, SILT, trace sand, dark gray, no odor. (Fill)		
11							ML	Brick fragments. Hard, dark gray to black.		
12								Wet, medium dense, silty SAND, dark gray, no odor. (Fill)		
13										
14			100							
15								Wood debris.		

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BORING LOG
B34

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Combo Rig
Location:	3' N and 123' W of the SE corner of the property.
Surface Condition:	Asphalt
Total Depth:	22
First GW Depth:	6

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15							FILL	Wet, medium dense, silty SAND, dark gray, no odor. (Fill) Wood debris.		
16		2.0			B34-16			Wet, dense, silty fine to coarse SAND, trace fine gravel, gray, no odors. (Native)		
17			100							
18										
19							SM	Coarse gravel.		
20			100							
21										
22		1.5						Boring terminated at 22 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface with asphalt.		
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B34

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	174' N and 44' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0						▨		Gravel. (Fill) Damp, dense, silty sandy GRAVEL, brown, no odor. (Fill) Moist, medium dense, fine- to medium-grained SAND, few gravel, trace silt, brown, no odor. (Fill)		
1						▨				
2		0.7	100		B35-02	▨		Moist, medium dense, silty fine- to medium-grained SAND, few gravel, gray, no odor. (Fill)		
3						▨				
4						▨		Trace gravel, dark gray, faint petroleum odor.		
5		0.3				▨				
6		0.7	50			▨		Moist to wet.		
7						▨	FILL			
8		0.0				▨		Wet.	▽	
9					B35-09	▨				
10			25			▨				
11						▨				
12						▨		No recovery.		
13						▨				
14			0			▨				
15										

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BORING LOG
B35

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	174' N and 44' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15						▨		No recovery.		
16						▨	FILL	Wet, loose, silty fine- to coarse-grained SAND, trace gravel, dark gray, no odor. (Fill)		
17			100		B35-17.5	▨				
18								Rounded GRAVEL, apparent bedding material for adjacent 96" diameter concrete sewer main. (Fill) Boring terminated at 18 feet below ground surface due to refusal. Boring backfilled with bentonite and finished flush to the surface.		
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B35

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	132' N and 42' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Gravel. (Fill) Moist, medium dense, silty fine-grained SAND, some gravel, brown, no odor. (Fill)		
1										
2		0.0	100		B36-02			Moist.		
3								Moist, dense, SILT with few sand, slightly cohesive, greenish-gray, no odor. (Fill)		
4								Cobble.		
5								Brick fragments.		
6			100					Moist, medium dense, sandy SILT, gray, no odor.		
7		0.0			B36-07		FILL	Wood debris.		
8								Wet.	▽	
9										
10			50							
11										
12		0.0						Gravel. (Fill) Wet, loose, soft, silty SAND, greenish-gray, no odor. (Fill)		
13										
14		0.0	100		B36-14					
15										

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BORING LOG
B36

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	132' N and 42' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15				☒		▨		Wet, loose, soft, silty SAND, greenish-gray, no odor. (Fill) Moist, dense.		
16		0.0		☒		▨	FILL			
17		0.0	100			▨				
18								Rounded GRAVEL, apparent bedding material for 96" concrete sewer. (Fill) Boring terminated at 18 feet below ground surface due to refusal. Boring backfilled with bentonite and finished flush to the surface.		
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B36

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	78' N and 49' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Gravel. (Fill) Damp, loose, silty sandy GRAVEL, brown, no odor. (Fill)		
		0.0			B37-0.75					
1										
2			75					Wood (railroad tie), strong creosote odor, visible tar residue on wood. (Fill)		
3										
4								Poor recovery, cobbly.		
5										
6			0							
7							FILL			
8								Wet, medium dense, silty fine- to medium-grained SAND, trace gravel, gray, no odor. (Fill)	▽	
9		0.0			B37-09					
10			100							
11								Crushed asphalt.		
12					B37-12			No recovery.		
13										
14		0.0	25							
15										

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BORING LOG
B37

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	78' N and 49' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	18
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15				☒		▨		No recovery.		
16				☒		▨	FILL	Wet, loose, silty fine- to coarse-grained SAND, trace gravel, dark gray, no odor. (Fill)		
17		0.0	100			▨				
18								Rounded GRAVEL, apparent bedding material for 96" concrete sewer. (Fill) Boring terminated at 18 feet below ground surface due to refusal. Boring backfilled with bentonite and finished flush to the surface.		
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B37

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	48' N and 9' E of the SE corner of the property.
Surface Condition:	Asphalt
Total Depth:	21
First GW Depth:	6.75

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0						▨		Topsoil, gravel. (Fill) Moist, loose, fine- to medium-grained SAND, some gravel, few silt, brown, no odor. (Fill)		
1										
2		0.2	95		B38-02					
3										
4								Brick fragments. Pea gravel. (Fill)		
5										
6			95				FILL			
7		0.7			B38-07			Wet, medium dense, fine- to medium-grained SAND, some gravel, trace silt, dark gray, no odor. (Fill)	▽	
8								With shell fragments, no gravel.		
9										
10			75							
11										
12		0.8			B38-12	⁙		Hard, SILT, wood debris, dark gray, no odor. (Fill) Wet, dense, silty SAND, greenish-gray, no odor. (Native)		
13			25				SM			
14										
15										

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BORING LOG
B38

Log of Exploratory Boring:

Notes

Drilling Co./Driller: ESN
Drilling Method: Direct Push
Location: 48' N and 9' E of the SE corner of the property.
Surface Condition: Asphalt
Total Depth: 21
First GW Depth: 6.75

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15		1.4						Wet, dense, silty SAND, greenish-gray, no odor. (Native)		
16			100							
17										
18		0.6					SM	Gray.		
19		0.4	100							
20										
21								Boring terminated at 24 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface with asphalt.		
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B38

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	71' N and 153' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	17
First GW Depth:	2.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Concrete slab. (Fill)		
1								Moist, loose, fine- to medium-grained SAND, trace silt, dark gray, no odor. (Fill)		
2			75						∇	
3		0.7					FILL	Wet.		
4										
5		0.3			B39-05.5			Wood debris, strong creosote odor, visible tar residue on wood. (Fill)		
6			100					Moist, hard, SILT, trace sand, gray, faint creosote odor. (Native)		
7										
8							ML			
9			100							
10		0.2			B39-10.5			Moist to wet, dense, silty fine- to medium-grained SAND, gray, no odor. (Native)		
11								Wet.		
12			100				SM			
13										
14		0.4								
15										

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BORING LOG
B39

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	71' N and 153' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	17
First GW Depth:	2.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15			100	☒		▨	SM	Moist to wet, dense, silty fine- to medium-grained SAND, gray, no odor. (Native)		
16										
17		0.4						Boring terminated at 17 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface with concrete.		
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B39

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	174' N and 153' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	17
First GW Depth:	4

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Concrete slab. (Fill)		
1								Moist, loose, fine- to medium-grained SAND, trace silt, dark gray, no odor. (Fill)		
2			100							
3		8.9					FILL	Wood debris, strong creosote odor, visible tar residue on wood. (Fill)		
4		3.2						Moist, loose, fine- to medium-grained SAND, trace silt, dark gray, moderate creosote odor. (Fill)	▽	
5		2.8			B40-05.25					
6			100				SM ML	Wood debris, strong creosote odor, visible tar residue on wood. (Fill) Wet, medium dense, silty SAND, dark gray, moderate creosote odor. (Fill) Wet, medium dense, sandy SILT, light gray, no odor. (Native)		
7								Wet, dense, SAND with trace silt, dark gray, no odor. (Native)		
8										
9			100				SP			
10										
11		2.0			B40-11.5			Moist, dense, silty SAND, gray, no odor. (Native)		
12			100							
13							SM			
14										
15										

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BORING LOG
B40

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	174' N and 153' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	17
First GW Depth:	4

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15			100	X		░		Moist, dense, silty SAND, gray, no odor. (Native)		
16							SM			
17								Boring terminated at 17 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface with concrete.		
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

SOUND ENVIRONMENTAL STRATEGIES
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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/21/2007
Date Finished: 11/21/2007
Logged By: PJK
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B40

Page 2 of 2

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 399' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0				☒		▨		Moist, silty SAND, some gravel, some cinder-like fragments, dark brown, no odor. (Fill)		
1		2.2			B41-01	▨				
2			85			▨		Moist, sandy SILT, few gravel, brown, no odor. (Fill)		
3		14.7			B41-03	▨				
4				☒		▨				
5						▨				
6			70			▨		Moist, fine-grained SAND, few gravel, brown, no odor. (Fill)		
7		1.3				▨	FILL			
8				☒		▨		Wet, gray.	▽	
9						▨				
10			75			▨				
11		1.7				▨		Wet, SILT, gray, no odor. (Fill)		
12				☒		▨		Wet, loose, fine-grained SAND, no odor. (Fill)		
13						▨				
14			100			▨		Wet, loose, SILT with wood debris, no odor. (Fill)		
15										

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BORING LOG
B41

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 399' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Wet, silty SAND, few gravel, gray, no odor. (Native)		
16										
17										
			100							
18					B41-18					
							SM			
19										
20										
			100							
21										
22								Boring terminated at 22 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B41

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 44' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	19
First GW Depth:	6

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Moist, silty SAND, some gravel, trace cinder-like fragments, dark brown, no odor. (Fill)		
1		0.0			B42-01			Moist, sandy SILT, few gravel, brown, no odor. (Fill)		
2			75							
3		0.0								
4								Moist, fine-grained SAND, brown, no odor. (Fill)		
5										
6		0.0	100		B42-06		FILL	Wet, gray.	▽	
7										
8								Wet, soft, SILT with wood fragments, grayish-brown, no odor. (Fill)		
9		0.0						Wet, gravelly silty SAND, gray, no odor. (Fill)		
10			75					Wet, soft, sandy SILT, brown, no odor. (Fill)		
11										
12								Wet, silty SAND, some gravel, gray, no odor. (Native)		
		0.0			B42-12.5					
13							SM	Few gravel.		
14			100					No gravel.		
15										

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BORING LOG
B42

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 44' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	19
First GW Depth:	6

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Wet, silty SAND, some gravel, gray, no odor. (Native)		
16		0.0					SM			
17			100					Wet, sandy SILT, gray, no odor. (Native)		
18							ML			
19		0.0						Boring terminated at 19 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B42

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 246' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	23
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								Moist, silty fine-grained SAND, some gravel, wood fragments, dark brown, no odor. (Fill)		
1		0.0			B43-01					
2			75					Moist, sandy SILT, few gravel, intermittent silt lenses, brown, no odor. (Fill)		
3		0.0								
4								Moist, fine-grained SAND, intermittent silt lenses, grayish-brown to brown, no odor. (Fill)		
5										
6			75							
7		0.0					FILL			
8								Wet, no silt lenses.	▽	
9										
10		0.0	100		B43-10					
11								Wet, soft, SILT with organics and wood fragments, some sand, brown to gray, slight creosote odor on wood fragments. (Fill)		
12										
13		0.0						Red brick fragments.		
14			100							
15										

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BORING LOG
B43

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Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 246' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	23
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15							FILL	Wet, soft, SILT with organics and wood fragments, some sand, brown to gray, slight creosote odor on wood fragments. (Fill)		
16										
17		0.0			B43-17		ML	Wet, clayey SILT, gray, no odor. (Native)		
18			100				SM	Wet, silty fine-grained SAND, few gravel, gray, no odor. (Native)		
19										
20		0.0								
21			100							
22										
23		0.0						Boring terminated at 23 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B43

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 330' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0						▨		Moist, silty fine-grained SAND, some gravel, some cinder-like fragments, dark brown to black, no odor. (Fill)		
1		0.0			B44-01					
2			75					Moist, fine-grained SAND, some silt, few gravel, brown, no odor. (Fill)		
3		0.0								
4								Moist, fine-grained SAND, brown, no odor. (Fill)		
5										
6			75							
7		0.0					FILL			
8								Iron precipitate. Wet, gray.	▽	
9										
10			75							
11		0.0			B44-11					
12								Wet, SILT, some organics, gray, no odor. (Fill) Wet, fine-grained SAND, gray, no odor. (Fill)		
13								Wood debris and organics. (Fill)		
14			75			▥	ML	Soft, fine-grained sandy SILT, light gray, no odor. (Native)		
15										

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BORING LOG
B44

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	1' S and 330' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	8

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								Soft, fine-grained sandy SILT, light gray, no odor. (Native)		
							ML			
16		0.0			B44-16			Wet, silty fine-grained SAND, few gravel, gray, no odor. (Native)		
17										
			100							
18										
19		0.0					SM			
20										
			100							
21										
22		0.0								
								Boring terminated at 22 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B44

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	3' N and 183' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	9

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0				☒		▨	FILL	Moist, gravelly fine-grained SAND, some silt, some cinder-like fragments, dark brown to black, no odor. (Fill)		
1		0.0			B45-01					
2			75					Moist, gravelly fine-grained SAND, light grayish-brown, no odor. (Fill)		
3		0.0								
4				☒				Moist, fine-grained SAND, few gravel, intermittent silt layers, grayish-brown, no odor. (Fill)		
5										
6			100							
7		0.0								
8				☒						
9		0.0						Wet, gray.	▽	
10			100							
11								Wet, SILT, some organics, gray, no odor. (Fill)		
		0.0			B45-11.5					
12				☒				Wood debris. (Fill) Wet, clayey SILT, some sand, some organics and wood fragments, dark brown, no odor. (Fill) Red brick fragments.		
13										
14			100							
						▥	ML	Wet, clayey SILT, gray, no odor. (Native)		
15										

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BORING LOG
B45

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN
Drilling Method:	Direct Push
Location:	3' N and 183' W of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	22
First GW Depth:	9

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15		0.0			B45-15		ML			
16								Wet, silty fine-grained SAND, few gravel, gray, no odor. (Native) Light grayish-brown to gray.		
17										
18			100							
19		0.0					SM			
20								Gray.		
21			100							
22		0.0						Boring terminated at 22 feet below ground surface. Boring backfilled with bentonite and finished flush to the surface.		
23										
24										
25										
26										
27										
28										
29										
30										

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BORING LOG
B45

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-13.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	120' N and 153' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	16.5
First GW Depth:	5

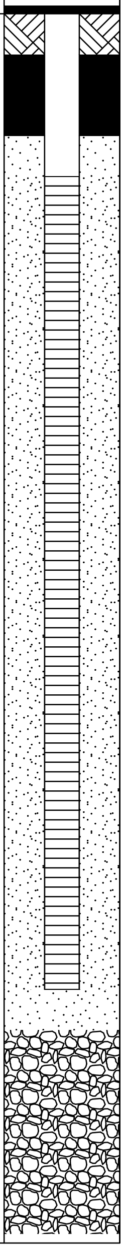
Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content
0			100	☒		▩		Concrete slab. (Fill)	
1						▩			
2						▩			
3						▩			
4						▩	FILL		
5		3.6	100	☒	B46-05	▩		Wet, loose, fine- to medium-grained SAND, trace silt, dark gray, faint hydrocarbon odor. (Fill)	▽
6						▩			
7						▩			
8		1.1	85	☒	B46-08		ML	Wet, dense, clayey SILT, dark gray, very faint hydrocarbon odor. (Native)	
9									
10		1.3	100	☒			SC-SM	Wet, dense, silty fine- to medium-grained SAND, trace gravel, dark gray, no odor. (Native)	
11									
12									
13		1.2	100	☒			SM	Wet, dense, silty fine- to medium-grained SAND, trace gravel, dark gray, no odor. (Native)	
14									
15									

Well Detail



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BORING LOG
B46

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-13.

Drilling Co./Driller: Cascade
Drilling Method: HSA
Location: 120' N and 153' W of the SE corner of the property.

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Surface Condition: Concrete
Total Depth: 16.5
First GW Depth: 5

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15 16		1.3	60	☒		▨	SM	Wet, dense, silty fine- to medium-grained SAND, trace gravel, dark gray, no odor. (Native)		▨
17 18 19 20 21 22 23 24 25 26 27 28 29 30								Boring terminated at 16.5 feet below ground surface. Two-inch diameter monitoring well MW-13 installed as illustrated above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 2' - 12' bgs.		

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BORING LOG
B46

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-14.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	205' N and 305' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	18.5
First GW Depth:	8.5

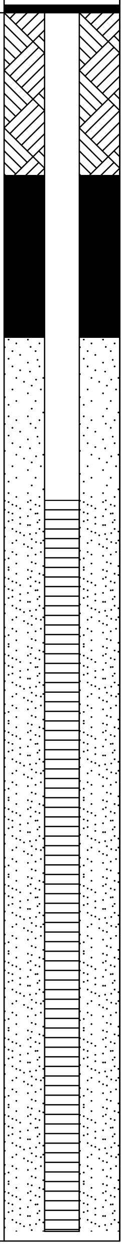
Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content
0			100				FILL	Concrete slab. (Fill)	
5–6		0.9	100		B47-05.5			Moist, medium dense, fine- to medium-grained SAND, trace gravel, grayish-brown, no odor. (Fill)	
8–9		1.2	100					Moist, medium dense, fine- to medium-grained SAND, trace gravel, grayish-brown, no odor. (Fill) Moist to wet, some gravel. Wet.	▽
10–11		1.1	100		B47-11.5			Wet, medium dense, fine- to medium-grained SAND, grayish-brown, no odor. (Fill) Wood debris, no odor.	
13		1.2	100				FILL	Wet, medium dense, fine- to medium-grained SAND, grayish-brown, no odor. (Fill)	
13–15							ML	Moist, dense, clayey SILT, greenish-gray, no odor. (Native)	

Well Detail



SOUND ENVIRONMENTAL STRATEGIES
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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/27/2007
Date Finished: 11/27/2007
Logged By: PJK
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B47

Log of Exploratory Boring:

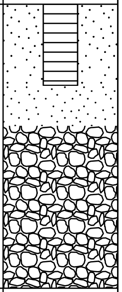
Notes
Completed as monitoring well MW-14.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	205' N and 305' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	18.5
First GW Depth:	8.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15		2.4	100	☒			SM	Wet, medium dense to dense, silty fine- to medium-grained SAND, gray, no odor. (Native)		
16					B47-16					
17										
18			0	☒				No recovery.		
19								Boring terminated at 18.5 feet below ground surface. Two-inch diameter monitoring well MW-14 installed as illustrated above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 6' - 16' bgs.		
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

SOUND ENVIRONMENTAL STRATEGIES
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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/27/2007
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BORING LOG
B47

Page 2 of 2

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-15.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	205' N and 417' W of the SE corner of the property.
Surface Condition:	Concrete
Total Depth:	21.5
First GW Depth:	7.5

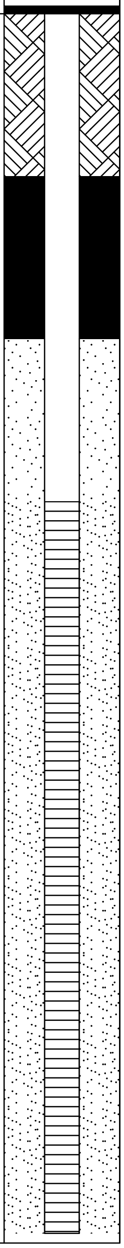
Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content
0			100					Concrete slab. (Fill)	
1									
2									
3									
4							FILL		
5								Moist, medium dense, silty fine- to medium-grained SAND, trace gravel, grayish-brown, no odor. (Fill)	
6		1.5	100		B48-06				
7									▽
8		1.7	25					Wet, medium dense, silty fine- to medium-grained SAND, trace gravel, grayish-brown, no odor. (Fill)	
9									
10			5					No recovery.	
11									
12									
13			25				SM	Wet, dense, silty fine- to medium-grained SAND, trace gravel, grayish-brown, no odor. (Native)	
14									
15									

Well Detail



Former Wesmar Property
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BORING LOG
B48

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Log of Exploratory Boring:

Notes
Completed as monitoring well MW-15.

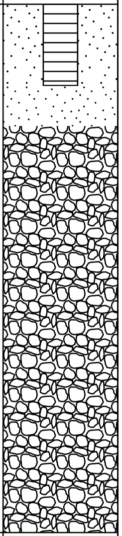
Drilling Co./Driller: Cascade
Drilling Method: HSA
Location: 205' N and 417' W of the SE corner of the property.
Surface Condition: Concrete
Total Depth: 21.5
First GW Depth: 7.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15		0.2	33	☒	B48-15	▨	SM	Wet, dense, silty fine- to medium-grained SAND, dark gray, no odor. (Native)		
16										
17										
18			100	☒		▨	SM	Wet, dense, silty fine- to medium-grained SAND, dark gray, no odor. (Native)		
19										
20			100	☒		▨	SM	Wet, dense, silty fine- to medium-grained SAND, dark gray, no odor. (Native)		
21										
22								Boring terminated at 21.5 feet below ground surface. Two-inch diameter monitoring well MW-15 installed as illustrated above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 6' - 16' bgs.		
23										
24										
25										
26										
27										
28										
29										
30										



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Date Started: 11/28/2007
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BORING LOG
B48

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-16.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	23' N and 49' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	17.5
First GW Depth:	10

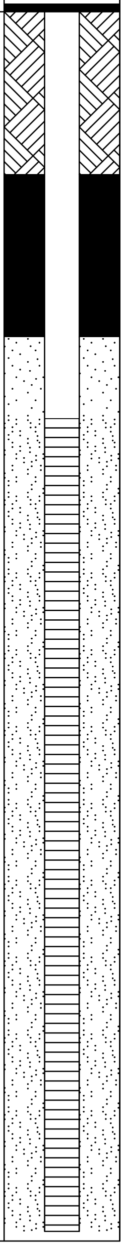
Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content
0							FILL		
5–6.5		2.5	100	☒	B49-05.5			Moist, medium dense, silty fine- to medium-grained SAND, trace gravel, gray, very faint hydrocarbon odor. (Fill)	
7.5–9		1.2	100	☒				Moist to wet, medium dense, silty fine- to medium-grained SAND, trace gravel, gray, very faint hydrocarbon odor. (Fill)	
10–11.5		1.2	65	☒	B49-10.5			Wet, loose, silty fine- to medium-grained SAND, trace gravel, dark gray, very faint hydrocarbon odor. (Fill)	∇
12–13.5			100	☒				Wet, loose, silty fine- to medium-grained SAND, trace gravel, dark gray, very faint hydrocarbon odor. (Fill) Fine GRAVEL. (Fill) Wet, loose, silty fine- to medium-grained SAND, trace gravel, dark gray, very faint hydrocarbon odor. (Fill)	
15									

Well Detail



Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/29/2007
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SES Project No.: 0398-002-01
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BORING LOG
B49

Log of Exploratory Boring:

Notes
Completed as monitoring well MW-16.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	23' N and 49' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	17.5
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15 16 17		1.1	100	☒		▨	FILL	Wet, loose, silty fine- to medium-grained SAND, trace gravel, dark gray, very faint hydrocarbon odor. (Fill)		
18 19 20 21 22 23 24 25 26 27 28 29 30								Driller reports hitting something very hard. Boring terminated at 17.5 feet below ground surface. Two-inch diameter monitoring well MW-16 installed as illustrated above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 5' - 15' bgs.		

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BORING LOG
B49

Log of Exploratory Boring:

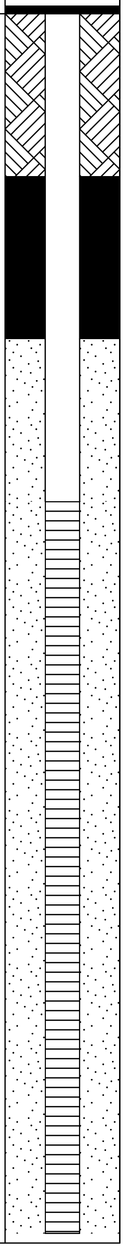
Notes
Completed as monitoring well MW-17.

Drilling Co./Driller:	Cascade
Drilling Method:	HSA
Location:	201' N and 40' E of the SE corner of the property.
Surface Condition:	Gravel
Total Depth:	16
First GW Depth:	

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0								No samples collected from boring due to the proximity to B-35. (Fill)		
1										
2										
3										
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11										
12										
13										
14										
15										

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 11/29/2007
Date Finished: 11/29/2007
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BORING LOG
B50

Page 1 of 2

Log of Exploratory Boring:

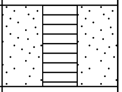
Notes
Completed as monitoring well MW-17.

Drilling Co./Driller: Cascade
Drilling Method: HSA
Location: 201' N and 40' E of the SE corner of the property.
Surface Condition: Gravel
Total Depth: 16
First GW Depth:

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
15								No samples collected from boring due to the proximity to B-35. (Fill)		
16								Boring terminated at 16 feet below ground surface. Two-inch diameter monitoring well MW-17 installed as illustrated above-right, using 2-inch PVC, 0.010 slot screen, 10-20 silica sand, bentonite chips, and concrete seal. Slotted screen 6' - 16' bgs.		
17										
18										
19										
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										

SOUND ENVIRONMENTAL STRATEGIES
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Seattle, Washington

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BORING LOG
B50

Page 2 of 2

Log of Exploratory Boring:

Notes

Drilling Co./Driller: Chris Carter
Drilling Method: Hand Auger
Location: 10 ft S of B42
Surface Condition: Gravel
Total Depth: 2
First GW Depth: Not encountered

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0			100	☒		▨		Moist, silty SAND, some gravel, trace cinder-like fragments, dark brown, no odor.		
1			100	☒	B51-1	▨	FILL			
			100	☒		▨				
2								End of boring at 2 feet bgs. Backfilled with cuttings.		
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

SOUND ENVIRONMENTAL STRATEGIES
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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 4/24/2008
Date Finished: 4/24/2008
Logged By: CMC
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File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B51

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	Chris Carter
Drilling Method:	Hand Auger
Location:	10 ft W of B42
Surface Condition:	Gravel
Total Depth:	2
First GW Depth:	Not encountered

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0			100	☒		▩		Moist, silty SAND, some gravel, trace cinder-like fragments, dark brown, no odor.		
1			100	☒	B52-1	▩	FILL			
			100	☒		▩				
2								End of boring at 2 feet bgs. Backfilled with cuttings.		
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

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BORING LOG
B52

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Rich
Drilling Method:	Direct Push
Location:	4' N and 9' E of MW-14
Surface Condition:	Asphalt
Total Depth:	16
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							CONC	Asphalt		
1								Damp, medium dense, silty SAND, brown, no hydrocarbon odor.		
2		0.0							Damp	
3		0.4					FILL		Damp	
4										
5		0.3							Damp	
6							FILL	Damp, medium dense, fine to medium SAND with silt, brown, no hydrocarbon odor.		
7		1.0						Damp, medium dense, silty SAND, brown, no hydrocarbon odor.	Damp	
8							FILL			
9										
10		1.1 1.3						Wet, stiff, SILT, black, no hydrocarbon odor.	▽ Damp	
11		1.3			B53-11.5		ML		Wet	
12								Damp, hard, SILT, grey with brown motteling, no hydrocarbon odor.		
13							ML			
14		1.1 0.7							Damp	
15							SP	Moist, very dense, fine to medium SAND with silt, grey, no hydrocarbon odor.		
16		0.4			B53-16				Moist	
17								End of boring at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with cold patch asphalt.		
18										
19										
20										

SOUND ENVIRONMENTAL STRATEGIES
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Former Wesmar Property
1401 & 1451 Northwest 46th Street
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BORING LOG
B53

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Rich
Drilling Method:	Direct Push
Location:	4' N and 10' W of MW-14
Surface Condition:	Asphalt
Total Depth:	16
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							CONC	Asphalt		
1		0.0						Damp, dense, silty SAND, brown, no odor.		
2		0.0								
3		0.0								
4							FILL			
5		0.0								
6		0.0								
7		0.0								
8								Damp, dense, silty SAND, gray, no odor.		
9		0.0					FILL		Damp	
10		0.0						Wet, hard, SILT, black, slight creosote odor.	▽	
11		0.0					ML			
		0.0			B54-11.5					
12								Damp, hard, SILT, grey with brown mottling, no odor.		
13		0.0					ML		Damp	
14		0.0							Wet	
15		0.0					SM	Damp, very dense, silty SAND, grey, no odor.		
16		0.0			B54-16				Damp	
17								Boring terminated at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with cold patch asphalt.		
18										
19										
20										

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BORING LOG
B54

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Rich
Drilling Method:	Direct Push
Location:	9' N of MW-14
Surface Condition:	Asphalt
Total Depth:	16
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							CONC	Asphalt		
1		0.0						Damp, dense, silty SAND, brown, no odor.	Damp	
2		0.0								
3		0.0								
4							FILL			
5		0.0								
6		0.0								
7		0.0						Damp, dense, silty SAND, gray, no odor.		
8							FILL			
9		0.0								
10		0.0					FILL	Wet, dense, silty SAND, gray, no odor.	▽	
11		0.0 0.0			B55-11.5		FILL	Wet, dense, silty SAND, black, slight creosote odor.		
12								Damp, hard, SILT, gray with brown mottling, no odor.		
13		0.0					ML		Damp	
14		0.0							Wet	
15		0.0					SP	Damp, very dense, fine to medium SAND with silt, gray, no hydrocarbon odor.		
16		0.0			B55-16				Damp	
17								Boring terminated at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with cold patch asphalt.		
18										
19										
20										

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Logged By: RAH
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B55

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Rich
Drilling Method:	Direct Push
Location:	10' S and 10' W of B34
Surface Condition:	Gravel
Total Depth:	16
First GW Depth:	8.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
∇ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	5/8 crushed rock		
1		0.0						Damp, medium dense, fine to medium SAND with silt, brown, no hydrocarbon odor. Fill material.	Damp	
2		0.0							Damp	
3		0.0							Damp	
4							FILL			
5		0.0							Damp	
6		0.0							Damp	
7		0.0							Damp	
							SP	Damp, medium dense, fine to medium SAND with silt and brick fragments, brown, no hydrocarbon odor. Fill material.		
8										
								Wet, medium dense, fine to medium SAND with silt, grey, no hydorcarbon odor. Fill material.	∇	
9		0.0			B56-09				Wet	
							SP			
10		0.0							Wet	
11		0.0							Wet	
							SP	Wet, medium dense, fine to medium SAND with silt and brick fragments, grey, no hydrocarbon odor. Fill material.		
12										
								Wet, medium dense, fine to medium SAND with silt, grey, no hydrocarbon odor. Native material.		
13		0.0					SP		Wet	
14		0.0							Wet	
							SP	Wet, medium dense, fine to medium SAND with silt, black, no hydrocarbon odor. Native material.		
15		0.0							Damp	
							ML	Damp, hard, SILT, grey, no hydrocarbon odor. Native material.		
16		0.0			B56-16				Damp	
17										
								End of boring at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with gravel.		
18										
19										
20										

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 6/6/2008
Date Finished: 6/6/2008
Logged By: RAH
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B56

Page 1 of 1

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Rich
Drilling Method:	Direct Push
Location:	10' S and 10' E of B34
Surface Condition:	Gravel
Total Depth:	16
First GW Depth:	6

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	5/8" crushed rock		
1		0.0						Damp, dense, fine SAND with subangular fine gravel and brick fragments, brown, no hydrocarbon odor. Fill material.	Damp	
2		0.0					FILL		Damp	
3		0.0							Damp	
4										
5		0.0					FILL	Damp, dense, fine SAND with subangular fine gravel, grey, no hydrocarbon odor. Fill material.	Damp	
6		0.0							▽ Damp Wet	
7		0.0						Wet, dense, fine SAND with subangular fine gravel and brick fragments, grey, no hydrocarbon odor. Fill material.	Wet	
8							FILL			
9		0.0			B57-09				Wet	
10		0.0					ML	Damp, hard, SILT with fine sand, brownish grey, no hydrocarbon odor. Fill material.	Wet	
11		0.0						Wet, dense, medium SAND with shell fragments, grey, no hydrocarbon odor. Native material.	Wet	
12							SP			
13		0.0							Moist	
14		0.0					SM	Moist, dense, silty SAND, grey, no hydrocarbon odor. Native material.	Wet Damp	
15		0.0					ML	Damp, hard, SILT with wood shards, grey, no hydrocarbon odor. Native material.	Damp	
16		0.0			B57-16				Damp	
17										
18								End of boring at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with gravel.		
19										
20										

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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 6/6/2008
Date Finished: 6/6/2008
Logged By: RAH
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B57

Page 1 of 1

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Rich
Drilling Method:	Direct Push
Location:	20' S and 10' W of B34
Surface Condition:	Gravel
Total Depth:	16
First GW Depth:	10

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	5/8" crushed rock		
1		0.0						Damp, dense, fine to medium SAND, brown, no hydrocarbon odor. Fill material.	Damp	
2		0.0							Damp	
3		0.0							Damp	
4							FILL			
5		0.0							Damp	
6		0.0							Damp	
7		0.0							Damp	
8								Damp, dense, fine to medium SAND, grey, no hydrocarbon odor. Fill material.		
9		0.0			B57-09		FILL		Damp	
10		0.0						Wet, dense, fine to medium SAND, grey, no hydrocarbon odor. Fill material.	▽ Damp Wet	
11		0.0							Wet	
12							FILL			
13		0.0							Wet	
14		0.0							Wet	
15		0.0					FILL	Wet, dense, silty SAND, with brick fragments and wood shards, dark grey, no hydrocarbon odor. Fill material.	Wet	
16		0.0			B57-16				Wet	
17								End of boring at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with gravel.		
18										
19										
20										

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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 6/6/2008
Date Finished: 6/6/2008
Logged By: RAH
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B58

Log of Exploratory Boring:

Notes

Drilling Co./Driller: ESN / Rich
Drilling Method: Direct Push
Location: 15' S and 10' E of B34
Surface Condition: Gravel
Total Depth: 16
First GW Depth: 9

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							FILL	5/8" crushed rock		
1		0.0						Damp, dense, fine to medium SAND, brown, no hydrocarbon odor. Fill material.	Damp	
2		0.0							Damp	
3		0.0							Damp	
4							FILL			
5		0.0							Damp	
6		0.0							Damp	
7		0.0						Moist, dense, fine to medium SAND, grey, no hydrocarbon odor. Fill material.	Moist	
8							FILL			
9		0.0			B57-09			Wet, dense, fine to medium SAND, grey, no hydrocarbon odor. Fill material.	▽ Wet	
10		0.0							Moist Wet	
11		0.0							Wet	
12							FILL			
13		0.0							Wet	
14		0.0							Wet	
15		0.0					SP	Wet, dense, medium to fine SAND with shell fragments and wood shards, dark grey, no hydrocarbon odor. Native material.	Wet	
16		0.0			B57-16				Wet	
17								End of boring at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with gravel.		
18										
19										
20										

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Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 6/6/2008
Date Finished: 6/6/2008
Logged By: RAH
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B59

Log of Exploratory Boring:

Notes

Drilling Co./Driller: ESN / Rich
Drilling Method: Direct Push
Location: 45' N of MW 14 and 0' east of MW 14
Surface Condition: Asphalt
Total Depth: 16
First GW Depth: 7

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0						▨	FILL	Damp, loose to medium-dense silty SAND, sand is medium-grained, tan, no odor.		
4						▨	FILL	Damp to wet, loose silty SAND, sand is medium to fine-grained, tan to dark gray, no odor.		
7						▨			▽	
8						▨	FILL	Wet, loose silty SAND, sand is medium to fine-grained, dark gray, fill, no odor.		
11.5					B60-11.5	▥	ML	Wet, dense to very dense sandy SILT, sand is fine to medium-grained, green-gray, no odor.		
16					B60-16			Boring terminated at 16' below ground surface. Upon completion of the boring the borehole was filled with bentonite and finished to grade with cold patch asphalt.		
20										

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 6/17/2008
Date Finished: 6/7/2008
Logged By: EKR
Chk By: DMB
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File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B60

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Don
Drilling Method:	Direct Push
Location:	
Surface Condition:	Concrete
Total Depth:	8
First GW Depth:	0.5

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							CONC	6" of Concrete	▽	
1							FILL	Wet, SAND, fine to medium grained, trace fines, black, moderate creosote odor		
2			70							
3		48.7			B61-03			Wet, SILT, trace fine grained sand, black, moderate to slight creosote odor		
4								Slight creosote odor		
5		0			B61-05		ML			
6			90							
7		0			B61-08		ML	Wet, sandy SILT, some fine-to medium-grained sand, gray, no odor		
8								Boring terminated at 8 feet below ground surface. No monitoring well installed.		
9										
10										
11										
12										
13										
14										
15										

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 8/1/2008
Date Finished: 8/1/2008
Logged By: BAJ
Chk By: DMB
SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B61

Log of Exploratory Boring:

Notes

Drilling Co./Driller:	ESN / Don
Drilling Method:	Direct Push
Location:	
Surface Condition:	Concrete
Total Depth:	8
First GW Depth:	

Moisture Content:
Dry = Dry, Dp = Damp, Mst = Moist, Wet = Wet

Hydrocarbon Odor: NO = no odor, VFO = very faint odor
WO = weak odor, MO = moderate odor, SO = strong odor

Water Levels
▼ After Completion
▽ During Drilling

Depth (feet)	Blow Count	PID	Sample Recovery	Sample Interval	Sample ID	Lithography	USCS Class	Description	Moisture Content	Well Detail
0							CONC	6" of Concrete		
							SP	Moist, SAND, fine-to coarse-grained, trace fines, dark gray, moderate creosote odor		
1								Moist, SILT, trace fine-grained sand, black, strong creosote odor		
2			85							
3		8.7			B62-03		FILL			
4										
5		0			B62-05					
								Moist to wet, sandy SILT, fine-to medium-grained sand, gray, caustic odor		
6			90				ML			
7					B62-08					
							ML	Wet, SILT, trace fine-grained sand, gray, no odors		
8								Boring terminated at 8 feet below ground surface. No monitoring well installed.		
9										
10										
11										
12										
13										
14										
15										

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1401 & 1451 Northwest 46th Street
Seattle, Washington

Date Started: 8/1/2008
Date Finished: 8/1/2008
Logged By: BAJ
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SES Project No.: 0398-002-01
File ID.: P:\0398 BALLARD - RAMRAS\0398-002 BALLARD BLOCKS 2 (WESMAR)\FIELD WORK\FIELD SHEETS\BORING LOGS\2008 RIFS_CAP REPORT\0398-002-01 WESMAR BALLARD - BB2.GPJ

BORING LOG
B62

APPENDIX F

Laboratory Analytical Results

Friedman & Bruya, Inc. #711287

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
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3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 12, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on November 20, 2007 from the SOU_0398-002-03_20071120, F&BI 711287 project. There are 38 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: David Buser, Erin Rothman, Brandi Reyna, Pete Kingston
SOU1212R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 20, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20071120, F&BI 711287 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
711287-01	B27-02
711287-02	B27-04
711287-03	B27-06
711287-04	B27-08
711287-05	B27-12
711287-06	B27-15
711287-07	B27-19
711287-08	B27-22
711287-09	B27-26
711287-10	B27-28
711287-11	B26-03
711287-12	B26-06
711287-13	B26-08
711287-14	B26-11
711287-15	B26-14
711287-16	B26-16
711287-17	B28-03
711287-18	B28-06
711287-19	B28-07
711287-20	B28-08.5
711287-21	B28-12
711287-22	B29-03
711287-23	B29-06
711287-24	B29-11.5

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	B27-04	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-02
Date Analyzed:	12/04/07	Data File:	711287-02.036
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	87	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.07

Analysis For Total Metals By EPA Method 200.8

Client ID: B27-12
Date Received: 11/20/07
Date Extracted: 12/03/07
Date Analyzed: 12/04/07
Matrix: Soil
Units: mg/kg (ppm)

Client: Sound Environmental Strategies
Project: SOU_0398-002-03_20071120
Lab ID: 711287-05
Data File: 711287-05.039
Instrument: ICPMS1
Operator: HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	81	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	25.0

Analysis For Total Metals By EPA Method 200.8

Client ID:	B27-19	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-07
Date Analyzed:	12/04/07	Data File:	711287-07.041
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.83

Analysis For Total Metals By EPA Method 200.8

Client ID:	B26-06	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-12
Date Analyzed:	12/04/07	Data File:	711287-12.042
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.66

Analysis For Total Metals By EPA Method 200.8

Client ID:	B26-16	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-16
Date Analyzed:	12/04/07	Data File:	711287-16.043
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.76

Analysis For Total Metals By EPA Method 200.8

Client ID:	B28-07	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-19
Date Analyzed:	12/04/07	Data File:	711287-19.044
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	23.6

Analysis For Total Metals By EPA Method 200.8

Client ID:	B28-12	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-21
Date Analyzed:	12/04/07	Data File:	711287-21.045
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.37

Analysis For Total Metals By EPA Method 200.8

Client ID:	B29-03	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-22
Date Analyzed:	12/04/07	Data File:	711287-22.046
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.94

Analysis For Total Metals By EPA Method 200.8

Client ID:	B29-06	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-23
Date Analyzed:	12/04/07	Data File:	711287-23.047
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.63

Analysis For Total Metals By EPA Method 200.8

Client ID:	B29-11.5	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	711287-24
Date Analyzed:	12/04/07	Data File:	711287-24.048
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	9.09

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071120
Date Extracted:	12/03/07	Lab ID:	I7-453 mb
Date Analyzed:	12/04/07	Data File:	I7-453 mb.034
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	87	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID: B26-11
Date Received: 11/20/07
Date Extracted: 11/29/07
Date Analyzed: 11/30/07
Matrix: Soil
Units: mg/kg (ppm)

Client: Sound Environmental Strategies
Project: SOU_0398-002-03_20071120
Lab ID: 711287-14
Data File: 113005.D
Instrument: GCMS5
Operator: MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	88	32	147
1,2-Dichloroethane-d4	97	35	150
Toluene-d8	76	35	149
4-Bromofluorobenzene	81	15	196

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	Tetrachloroethene	<0.025
Chloromethane	<0.05	Dibromochloromethane	<0.05
Vinyl chloride	<0.05	1,2-Dibromoethane (EDB)	<0.05
Bromomethane	<0.5	Chlorobenzene	<0.05
Chloroethane	<0.5	Ethylbenzene	<0.05
Trichlorofluoromethane	<0.5	1,1,1,2-Tetrachloroethane	<0.05
Acetone	<0.5	m,p-Xylene	<0.1
1,1-Dichloroethene	<0.05	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon Tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.05
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.1
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.1
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.1
1,3-Dichloropropane	<0.05		

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	B28-07	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-19
Date Analyzed:	11/30/07	Data File:	113008.D
Matrix:	Soil	Instrument:	GCMS5
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	101	32	147
1,2-Dichloroethane-d4	109	35	150
Toluene-d8	102	35	149
4-Bromofluorobenzene	119	15	196

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	Tetrachloroethene	<0.025
Chloromethane	<0.05	Dibromochloromethane	<0.05
Vinyl chloride	<0.05	1,2-Dibromoethane (EDB)	<0.05
Bromomethane	<0.5	Chlorobenzene	<0.05
Chloroethane	<0.5	Ethylbenzene	<0.05
Trichlorofluoromethane	<0.5	1,1,1,2-Tetrachloroethane	<0.05
Acetone	<0.5	m,p-Xylene	<0.1
1,1-Dichloroethene	<0.05	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon Tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.05
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.1
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.1
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.1
1,3-Dichloropropane	<0.05		

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	B29-06	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-23
Date Analyzed:	11/30/07	Data File:	113009.D
Matrix:	Soil	Instrument:	GCMS5
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	84	32	147
1,2-Dichloroethane-d4	91	35	150
Toluene-d8	84	35	149
4-Bromofluorobenzene	96	15	196

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	Tetrachloroethene	<0.025
Chloromethane	<0.05	Dibromochloromethane	<0.05
Vinyl chloride	<0.05	1,2-Dibromoethane (EDB)	<0.05
Bromomethane	<0.5	Chlorobenzene	<0.05
Chloroethane	<0.5	Ethylbenzene	<0.05
Trichlorofluoromethane	<0.5	1,1,1,2-Tetrachloroethane	<0.05
Acetone	<0.5	m,p-Xylene	<0.1
1,1-Dichloroethene	<0.05	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon Tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.05
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.1
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.1
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.1
1,3-Dichloropropane	<0.05		

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	071894 mb
Date Analyzed:	11/30/07	Data File:	112927.D
Matrix:	Soil	Instrument:	GCMS5
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	122	32	147
1,2-Dichloroethane-d4	127	35	150
Toluene-d8	125	35	149
4-Bromofluorobenzene	141	15	196

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	Tetrachloroethene	<0.025
Chloromethane	<0.05	Dibromochloromethane	<0.05
Vinyl chloride	<0.05	1,2-Dibromoethane (EDB)	<0.05
Bromomethane	<0.5	Chlorobenzene	<0.05
Chloroethane	<0.5	Ethylbenzene	<0.05
Trichlorofluoromethane	<0.5	1,1,1,2-Tetrachloroethane	<0.05
Acetone	<0.5	m,p-Xylene	<0.1
1,1-Dichloroethene	<0.05	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon Tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.05
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.1
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.1
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.1
1,3-Dichloropropane	<0.05		

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B26-11	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/30/07	Lab ID:	711287-14
Date Analyzed:	12/01/07	Data File:	113037.D
Matrix:	Soil	Instrument:	GCMS3
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	72	25	121
Phenol-d6	78	24	113
2,4,6-Tribromophenol	32	19	122

Compounds:	Concentration mg/kg (ppm)
Pentachlorophenol	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B28-07	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/30/07	Lab ID:	711287-19
Date Analyzed:	12/01/07	Data File:	113036.D
Matrix:	Soil	Instrument:	GCMS3
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	82	25	121
Phenol-d6	86	24	113
2,4,6-Tribromophenol	66	19	122

Compounds:	Concentration mg/kg (ppm)
Pentachlorophenol	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B29-06	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/30/07	Lab ID:	711287-23
Date Analyzed:	12/01/07	Data File:	113033.D
Matrix:	Soil	Instrument:	GCMS3
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	78	25	121
Phenol-d6	82	24	113
2,4,6-Tribromophenol	56	19	122

Compounds:	Concentration mg/kg (ppm)
Pentachlorophenol	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/30/07	Lab ID:	071941mb
Date Analyzed:	12/01/07	Data File:	113032.D
Matrix:	Soil	Instrument:	GCMS3
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	75	25	121
Phenol-d6	78	24	113
2,4,6-Tribromophenol	52	19	122

Compounds:	Concentration mg/kg (ppm)
Pentachlorophenol	<0.02

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B27-12	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-05 1/5
Date Analyzed:	12/06/07	Data File:	120608.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	77	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B27-19	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-07 1/5
Date Analyzed:	12/06/07	Data File:	120609.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	116	50	150
Benzo(a)anthracene-d12	73	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B26-06	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-12 1/5
Date Analyzed:	12/06/07	Data File:	120607.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	50	150
Benzo(a)anthracene-d12	79	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	0.010
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B26-16	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-16 1/5
Date Analyzed:	12/06/07	Data File:	120610.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	50	150
Benzo(a)anthracene-d12	83	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B28-07	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-19 1/50
Date Analyzed:	12/08/07	Data File:	120729.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	213 ds	50	150
Benzo(a)anthracene-d12	84	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.37
Acenaphthylene	<0.1
Acenaphthene	0.76
Fluorene	1.7
Phenanthrene	14
Anthracene	3.2
Fluoranthene	12
Pyrene	14
Benz(a)anthracene	5.4
Chrysene	6.0
Benzo(a)pyrene	5.9
Benzo(b)fluoranthene	4.9
Benzo(k)fluoranthene	2.1
Indeno(1,2,3-cd)pyrene	3.4
Dibenz(a,h)anthracene	0.65
Benzo(g,h,i)perylene	3.2

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B28-12	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-21 1/5
Date Analyzed:	12/06/07	Data File:	120611.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	105	50	150
Benzo(a)anthracene-d12	80	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B29-06	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-23 1/5
Date Analyzed:	12/06/07	Data File:	120612.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	109	50	150
Benzo(a)anthracene-d12	77	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B29-11.5	Client:	Sound Environmental Strategies
Date Received:	11/20/07	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/29/07	Lab ID:	711287-24 1/5
Date Analyzed:	12/06/07	Data File:	120613.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	116	50	150
Benzo(a)anthracene-d12	85	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.012
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.014
Anthracene	<0.01
Fluoranthene	0.026
Pyrene	0.030
Benz(a)anthracene	0.013
Chrysene	0.015
Benzo(a)pyrene	0.017
Benzo(b)fluoranthene	0.015
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.012
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.012

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071120
Date Extracted:	11/28/07	Lab ID:	07-1928mb2 1/5
Date Analyzed:	12/06/07	Data File:	120530.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	111	50	150
Benzo(a)anthracene-d12	90	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287
Date Extracted: 11/30/07
Date Analyzed: 12/07/07

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR PCBs REPORTED AS AROCLORS USING EPA METHOD 8082

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

	Aroclor								Surrogate
Sample ID Laboratory ID	1221	1232	1016	1242	1248	1254	1260	1262	(% Rec.) (Limit 50-150)
B26-11 711287-14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	79
B28-07 711287-19	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	87
B29-06 711287-23	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	69
Method Blank	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	70

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711287-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	2.07	2.89	33 a	0-20

Laboratory Code: 711287-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	2.07	114 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	118	70-130

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 711391-19 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	<0.05	<0.05	nm
Chloromethane	mg/kg (ppm)	<0.05	<0.05	nm
Vinyl chloride	mg/kg (ppm)	<0.05	<0.05	nm
Bromomethane	mg/kg (ppm)	<0.5	<0.5	nm
Chloroethane	mg/kg (ppm)	<0.5	<0.5	nm
Trichlorofluoromethane	mg/kg (ppm)	<0.5	<0.5	nm
Acetone	mg/kg (ppm)	<0.5	<0.5	nm
1,1-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
Methylene chloride	mg/kg (ppm)	<0.5	<0.5	nm
trans-1,2-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
1,1-Dichloroethane	mg/kg (ppm)	<0.05	<0.05	nm
2,2-Dichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
cis-1,2-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
Chloroform	mg/kg (ppm)	<0.05	<0.05	nm
2-Butanone (MEK)	mg/kg (ppm)	<0.5	<0.5	nm
1,2-Dichloroethane (EDC)	mg/kg (ppm)	<0.05	<0.05	nm
1,1,1-Trichloroethane	mg/kg (ppm)	<0.05	<0.05	nm
1,1-Dichloropropene	mg/kg (ppm)	<0.05	<0.05	nm
Carbon Tetrachloride	mg/kg (ppm)	<0.05	<0.05	nm
Benzene	mg/kg (ppm)	<0.03	<0.03	nm
Trichloroethene	mg/kg (ppm)	<0.03	<0.03	nm
1,2-Dichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
Bromodichloromethane	mg/kg (ppm)	<0.05	<0.05	nm
Dibromomethane	mg/kg (ppm)	<0.05	<0.05	nm
4-Methyl-2-pentanone	mg/kg (ppm)	<0.5	<0.5	nm
cis-1,3-Dichloropropene	mg/kg (ppm)	<0.05	<0.05	nm
Toluene	mg/kg (ppm)	<0.05	<0.05	nm
trans-1,3-Dichloropropene	mg/kg (ppm)	<0.05	<0.05	nm
1,1,2-Trichloroethane	mg/kg (ppm)	<0.05	<0.05	nm
2-Hexanone	mg/kg (ppm)	<0.5	<0.5	nm
1,3-Dichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
Tetrachloroethene	mg/kg (ppm)	<0.025	<0.025	nm
Dibromochloromethane	mg/kg (ppm)	<0.05	<0.05	nm
1,2-Dibromoethane (EDB)	mg/kg (ppm)	<0.05	<0.05	nm
Chlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
Ethylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	<0.05	<0.05	nm
m,p-Xylene	mg/kg (ppm)	<0.1	<0.1	nm
o-Xylene	mg/kg (ppm)	<0.05	<0.05	nm
Styrene	mg/kg (ppm)	<0.05	<0.05	nm
Isopropylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
Bromoform	mg/kg (ppm)	<0.05	<0.05	nm
n-Propylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
Bromobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,3,5-Trimethylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	<0.05	<0.05	nm
1,2,3-Trichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
2-Chlorotoluene	mg/kg (ppm)	<0.05	<0.05	nm
4-Chlorotoluene	mg/kg (ppm)	<0.05	<0.05	nm
tert-Butylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,2,4-Trimethylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
sec-Butylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
p-Isopropyltoluene	mg/kg (ppm)	<0.05	<0.05	nm
1,3-Dichlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,4-Dichlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,2-Dichlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	<0.05	<0.05	nm
1,2,4-Trichlorobenzene	mg/kg (ppm)	<0.1	<0.1	nm
Hexachlorobutadiene	mg/kg (ppm)	<0.1	<0.1	nm
Naphthalene	mg/kg (ppm)	<0.05	<0.05	nm
1,2,3-Trichlorobenzene	mg/kg (ppm)	<0.1	<0.1	nm

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	89	94	29-163	5
Chloromethane	mg/kg (ppm)	2.5	83	84	28-147	1
Vinyl chloride	mg/kg (ppm)	2.5	92	94	38-143	2
Bromomethane	mg/kg (ppm)	2.5	97	95	32-163	2
Chloroethane	mg/kg (ppm)	2.5	110	117	10-165	6
Trichlorofluoromethane	mg/kg (ppm)	2.5	102	98	22-167	4
Acetone	mg/kg (ppm)	2.5	93	93	20-172	0
1,1-Dichloroethene	mg/kg (ppm)	2.5	95	93	42-140	2
Methylene chloride	mg/kg (ppm)	2.5	90	90	53-137	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	94	98	70-122	4
1,1-Dichloroethane	mg/kg (ppm)	2.5	96	97	77-114	1
2,2-Dichloropropane	mg/kg (ppm)	2.5	96	98	65-135	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	95	96	77-120	1
Chloroform	mg/kg (ppm)	2.5	95	97	76-117	2
2-Butanone (MEK)	mg/kg (ppm)	2.5	91	91	52-153	0
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	97	97	76-116	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	96	98	79-120	2
1,1-Dichloropropene	mg/kg (ppm)	2.5	95	96	76-123	1
Carbon Tetrachloride	mg/kg (ppm)	2.5	98	99	75-126	1
Benzene	mg/kg (ppm)	2.5	94	96	76-118	2
Trichloroethene	mg/kg (ppm)	2.5	95	96	75-121	1
1,2-Dichloropropane	mg/kg (ppm)	2.5	96	98	78-123	2
Bromodichloromethane	mg/kg (ppm)	2.5	99	101	79-126	2
Dibromomethane	mg/kg (ppm)	2.5	95	97	79-121	2
4-Methyl-2-pentanone	mg/kg (ppm)	2.5	104	105	52-151	1
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	97	100	80-127	3
Toluene	mg/kg (ppm)	2.5	100	102	76-122	2
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	106	106	80-126	0
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	101	104	77-121	3
2-Hexanone	mg/kg (ppm)	2.5	110	110	67-126	0
1,3-Dichloropropane	mg/kg (ppm)	2.5	101	103	76-122	2
Tetrachloroethene	mg/kg (ppm)	2.5	100	102	77-124	2
Dibromochloromethane	mg/kg (ppm)	2.5	88	91	73-127	3
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	102	104	78-126	2
Chlorobenzene	mg/kg (ppm)	2.5	98	101	79-113	3
Ethylbenzene	mg/kg (ppm)	2.5	100	101	77-120	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	103	105	79-125	2
m,p-Xylene	mg/kg (ppm)	5	102	103	79-121	1
o-Xylene	mg/kg (ppm)	2.5	104	106	80-123	2
Styrene	mg/kg (ppm)	2.5	106	109	81-124	3
Isopropylbenzene	mg/kg (ppm)	2.5	105	105	79-123	0
Bromoform	mg/kg (ppm)	2.5	88	90	65-124	2
n-Propylbenzene	mg/kg (ppm)	2.5	102	105	77-123	3
Bromobenzene	mg/kg (ppm)	2.5	99	103	78-122	4
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	104	106	79-123	2
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	98	101	73-121	3
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	98	102	69-123	4
2-Chlorotoluene	mg/kg (ppm)	2.5	99	103	77-120	4
4-Chlorotoluene	mg/kg (ppm)	2.5	101	104	77-121	3
tert-Butylbenzene	mg/kg (ppm)	2.5	103	105	77-124	2
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	103	106	78-123	3
sec-Butylbenzene	mg/kg (ppm)	2.5	103	103	77-122	0
p-Isopropyltoluene	mg/kg (ppm)	2.5	105	106	79-126	1
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	100	102	78-119	2
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	98	100	77-114	2
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	102	104	78-120	2
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	102	106	66-133	4
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	92	92	71-129	0
Hexachlorobutadiene	mg/kg (ppm)	2.5	100	90	65-134	11
Naphthalene	mg/kg (ppm)	2.5	91	93	51-158	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	94	95	37-182	1

Note: The calibration verification result for dibromochloromethane, bromoform, naphthalene and 1,2,3-trichlorobenzene exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the calibration is considered valid.

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 711287-23 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Pentachlorophenol	mg/kg (ppb)	<0.02	<0.02	nm

Laboratory Code: 711287-23 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Pentachlorophenol	mg/kg (ppb)	0.25	<0.02	94	27-121

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Pentachlorophenol	mg/kg (ppb)	0.25	95	98	29-123	3

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 711364-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	0.012	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	0.022	0.011	67 h
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	0.041	0.017	83 h
Pyrene	mg/kg (ppm)	0.046	0.019	83 h
Benz(a)anthracene	mg/kg (ppm)	0.039	0.018	74 h
Chrysene	mg/kg (ppm)	0.056	0.024	80 h
Benzo(b)fluoranthene	mg/kg (ppm)	0.082	0.031	90 h
Benzo(k)fluoranthene	mg/kg (ppm)	0.046	0.019	83 h
Benzo(a)pyrene	mg/kg (ppm)	0.079	0.030	90 h
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.079	0.032	85 h
Dibenz(a,h)anthracene	mg/kg (ppm)	0.014	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	0.068	0.028	83 h

Laboratory Code: 711364-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	0.012	88	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	89	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	84	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	87	57-113
Phenanthrene	mg/kg (ppm)	0.17	0.022	81	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	103	42-132
Fluoranthene	mg/kg (ppm)	0.17	0.041	98	45-145
Pyrene	mg/kg (ppm)	0.17	0.046	93	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	0.039	69	17-134
Chrysene	mg/kg (ppm)	0.17	0.056	85	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.082	50	37-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.046	97	28-134
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.079	75	55-115
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.079	97	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.014	89	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	0.068	75	60-105

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	91	93	66-106	2
Acenaphthylene	mg/kg (ppm)	0.17	89	91	63-110	2
Acenaphthene	mg/kg (ppm)	0.17	90	91	65-108	1
Fluorene	mg/kg (ppm)	0.17	92	93	63-112	1
Phenanthrene	mg/kg (ppm)	0.17	91	93	64-107	2
Anthracene	mg/kg (ppm)	0.17	84	84	64-107	0
Fluoranthene	mg/kg (ppm)	0.17	93	95	66-113	2
Pyrene	mg/kg (ppm)	0.17	93	95	66-111	2
Benz(a)anthracene	mg/kg (ppm)	0.17	86	87	55-103	1
Chrysene	mg/kg (ppm)	0.17	93	94	59-109	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	95	97	53-107	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	93	94	61-112	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	81	82	60-111	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	87	86	59-111	1
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	90	91	56-114	1
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	89	90	60-110	1

Note: The initial calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Date of Report: 12/12/07
Date Received: 11/20/07
Project: SOU_0398-002-03_20071120, F&BI 711287

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082

Laboratory Code: 711287-23 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	<0.1	<0.1	nm
Aroclor 1260	mg/kg (ppm)	<0.1	<0.1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	0.8	76	78	73-135	3
Aroclor 1260	mg/kg (ppm)	0.8	79	81	72-149	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

711287

SAMPLE CHAIN OF CUSTODY

ME 11-20-07 BI4/VS1

Send Report To Chris Carter CC: E. Rothman; D. Buser

Company 2400 Airport Way S Ste 200

Address SES

City, State, ZIP Seattle, WA 98134

Phone # 206 306 1900 Fax # 206 306 1902

SAMPLERS (*signature*) Pat Kingston

PROJECT NAME/NO. Wesmar 0398.002-03

PO #

REMARKS Hold all samples David will email which samples to run & by which analysis

GEMS [✓ Y] / N

Page # 1 of 2

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	As		Notes
B27-02	~~01~~ D	2	01	20071119	1017	Soil	1									
B27-04	~~02~~	4	02		1019									X		
B27-06	~~03~~	6	03		1020											
B27-08	~~04~~	8	04		1022											
B27-12	~~05~~	12	05		1018							X		X		
B27-15	~~06~~	15	06		1037											
B27-19	~~07~~	19	07		1105							X		X		
B27-22	~~08~~	22	08		1115											
B27-26	~~09~~	26	09		1144											
B27-28	~~10~~	28	10		1211											
B26-03	~~11~~	3	11		0938											
B26-06	~~12~~	6	12		0943							X		X		
B26-08	~~13~~	8	13	↓	0945	↓	↓									

Samples received at 5 °C

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:	Pat Kingston	Pete Kingston	SES	11/20/07	1330
Received by:	Champion At 120	BoB	Champion	11-20	1:35
Relinquished by:	Dong	Do VO	FBI	11/20/07	~~10.00~~ 14:00
Received by:					

FORMS\COC\SESGEMSR1.DOC (Revision 1)

711287

SAMPLE CHAIN OF CUSTODY

ME 11-20-07

BB4/VS1

Page # 2 of 3

Send Report To See Page One

Company

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO. See Page One

PO #

REMARKS

GEMS Y / N

TURNAROUND TIME

☐ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	As only ~~RCRA-8 Metals~~	PCB	PCP	Notes
B26-11	~~14~~	11	14A-E		1005		5				⊗			⊗	⊗	
B26-14		14	15		1008		1									
B26-16		16	16		1015							⊗	⊗			
B28-03		3	17		~~1500~~ 1420											
B28-06		6	18A-E		1430		5									
B28-07		7	19		1431						⊗	⊗	⊗	⊗	⊗	
B28-08.5		8.5	20		1433											
B28-12		12	21		1435							⊗	⊗			
B29-03		3	22		1500								⊗			
B29-06		6	23A-E		1510		5				⊗	⊗	⊗	⊗	⊗	
B29-11.5		11.5	24		1518							⊗	⊗			

Samples received at 5 °C

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:		Pete Kingston	SES	11/20/07	1330
Received by:		Da Vo	FBI	11	14:00
Relinquished by:					
Received by:					

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #711302

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 5, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on November 21, 2007 from the SOU_0398-002-03_20071121, F&BI 711302 project. There are 22 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SOU1205R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 21, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20071121, F&BI 711302 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
711302-01	RR01-0.5
711302-02	RR01-1.25
711302-03	RR01-02
711302-04	RR02-0.5
711302-05	RR02-1.25
711302-06	RR02-02
711302-07	RR03-0.5
711302-08	RR03-1.25
711302-09	RR03-02
711302-10	RR04-0.5
711302-11	RR04-1.25
711302-12	RR04-02
711302-13	RR05-0.5
711302-14	RR05-1.25
711302-15	RR05-02
711302-16	RR06-0.5
711302-17	RR06-1.25
711302-18	RR06-02

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR01-0.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-01
Date Analyzed:	11/30/07	Data File:	711302-01.009
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	102	60	125
Bismuth	108	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	87.8
Lead	236

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR01-1.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-02
Date Analyzed:	11/28/07	Data File:	711302-02.037
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	82	60	125
Bismuth	105	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	13.8
Lead	89.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR01-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-03
Date Analyzed:	11/28/07	Data File:	711302-03.038
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125
Bismuth	104	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.63
Lead	21.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR02-0.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-04
Date Analyzed:	11/28/07	Data File:	711302-04.039
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	88	60	125
Bismuth	100	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	93.3
Lead	248

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR02-1.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-05
Date Analyzed:	11/28/07	Data File:	711302-05.041
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125
Bismuth	106	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	28.9
Lead	137

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR02-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-06
Date Analyzed:	11/28/07	Data File:	711302-06.042
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125
Bismuth	103	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	6.39
Lead	23.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR03-0.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-07
Date Analyzed:	11/28/07	Data File:	711302-07.043
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	81	60	125
Bismuth	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	14.0
Lead	111

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR03-1.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-08
Date Analyzed:	11/28/07	Data File:	711302-08.044
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	79	60	125
Bismuth	100	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.62
Lead	23.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR03-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-09
Date Analyzed:	11/28/07	Data File:	711302-09.045
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	87	60	125
Bismuth	111	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.18
Lead	7.06

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR04-0.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-10
Date Analyzed:	11/28/07	Data File:	711302-10.046
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125
Bismuth	104	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	6.16
Lead	22.5

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR04-1.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-11
Date Analyzed:	11/28/07	Data File:	711302-11.047
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125
Bismuth	100	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.5
Lead	28.6

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR04-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-12
Date Analyzed:	11/28/07	Data File:	711302-12.048
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125
Bismuth	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	28.6
Lead	12.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR05-0.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-13
Date Analyzed:	11/28/07	Data File:	711302-13.049
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125
Bismuth	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.42
Lead	20.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR05-1.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-14
Date Analyzed:	11/28/07	Data File:	711302-14.050
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125
Bismuth	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.07
Lead	12.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR05-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-15
Date Analyzed:	11/28/07	Data File:	711302-15.052
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125
Bismuth	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.45
Lead	8.23

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR06-0.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-16
Date Analyzed:	11/28/07	Data File:	711302-16.053
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	89	60	125
Bismuth	106	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.63
Lead	21.0

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR06-1.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-17
Date Analyzed:	11/28/07	Data File:	711302-17.054
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	88	60	125
Bismuth	105	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.18
Lead	11.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR06-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	711302-18
Date Analyzed:	11/28/07	Data File:	711302-18.055
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	88	60	125
Bismuth	108	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.50
Lead	10.3

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/27/07	Lab ID:	I7-442 mb
Date Analyzed:	11/28/07	Data File:	I7-442 mb.032
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	82	60	125
Bismuth	106	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Lead	<1

Date of Report: 12/05/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711302

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711302-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	87.8	92.2	5	0-20
Lead	mg/kg (ppm)	236	235	0	0-20

Laboratory Code: 711302-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	87.8	282 b	50-150
Lead	mg/kg (ppm)	50	236	116 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	92	70-130
Lead	mg/kg (ppm)	50	98	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

711302

[redacted]

SAMPLE CHAIN OF CUSTODY

ME 11/21/07

[redacted]

BI4

Page # 1 of 2

Send Report To Chris Carter, & David Buser
Company SES
Address 2400 Airport Way S
City, State, ZIP Seattle, WA
Phone # 206-306-1900 Fax #

SAMPLERS (*signature*) Beau Shwan

PROJECT NAME/NO. Weimar

PO # 0398-002-03

REMARKS

GEMS [✓ Y] / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	Arsenic	Lead	Notes
RR01-0.5	RR01	0.5	01	11-20-07	1025	S	1							X	X	
RR01-1.25		1.25	02		1055											
RR01-02		2	03		1100											
RR02-0.5	RR02	0.5	04		1140											
RR02-1.25		1.25	05		1220											
RR02-02		2	06		1240											
RR03-0.5	RR03	0.5	07		1320											
RR03-1.25		1.25	08		1335											
RR03-02		2	09		1340											
RR04-0.5	RR04	0.5	10		1410											
RR04-1.25		1.25	11		1420											
RR04-02		2	12		1430											
RR05-0.5	RR05	0.5	13		1445											

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:	Beau Shwan	SES	11-21-07	
Received by:	Nhan Phan	F&BI	11-21-07	12:00
Relinquished by:				
Received by:	Samples received at 3 °C			

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711302
[redacted]

SAMPLE CHAIN OF CUSTODY

ME 11/21/07
[redacted]

014

Page # 2 of 2

Send Report To

Company

Address See Page 1

City, State, ZIP

Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO.: Wesmar

PO #: 0398-002-03

REMARKS

GEMS [✓ Y] / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	Arsenic	Lead	Notes
RR05-1.25	RR05	1.25	14	11-20-07	1455	S	1							X	X	
RR05-02	(	2	15		1515											
RR06-0.5	RR06	0.5	16		1535											
RR06-1.25		1.25	17		1555											
RR06-02		2	18		1610											

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
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SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Beau Sorenson	SES	11-21-07	
Received by:	Nhan Phan	FeBI	11/21/07	12:00
Relinquished by:				
Received by:		Samples received at 3 °C		

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #711309

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
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3012 16th Avenue West
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December 12, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on November 21, 2007 from the SOU_0398-002-03_20071121, F&BI 711309 project. There are 33 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Erin Rothman, David Buser, Brandi Reyna, Pete Kingston
SOU1212R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 21, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20071121, F&BI 711309 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
711309-01	B30-02
711309-02	B30-04
711309-03	B30-07
711309-04	B30-10
711309-05	B30-13
711309-06	B30-17
711309-07	B30-20
711309-08	B30-23
711309-09	B30-26
711309-10	B30-30
711309-11	B31-02
711309-12	B31-04
711309-13	B31-07
711309-14	B31-11.5
711309-15	B31-14
711309-16	B31-18
711309-17	B32-02
711309-18	B32-04
711309-19	B32-07
711309-20	B32-11
711309-21	B32-15
711309-22	B32-19
711309-23	B33-01
711309-24	B33-05
711309-25	B33-09
711309-26	B33-16
711309-27	B33-22
711309-28	B34-02
711309-29	B34-05
711309-30	B34-09
711309-31	B34-16
711309-32	B34-22

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	B30-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-01
Date Analyzed:	12/04/07	Data File:	711309-01.022
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.59

Analysis For Total Metals By EPA Method 200.8

Client ID:	B30-07	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-03
Date Analyzed:	12/04/07	Data File:	711309-03.023
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.55

Analysis For Total Metals By EPA Method 200.8

Client ID:	B30-13	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-05
Date Analyzed:	12/04/07	Data File:	711309-05.024
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.41

Analysis For Total Metals By EPA Method 200.8

Client ID:	B31-04	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-12
Date Analyzed:	12/04/07	Data File:	711309-12.025
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.88

Analysis For Total Metals By EPA Method 200.8

Client ID:	B31-11.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-14
Date Analyzed:	12/04/07	Data File:	711309-14.026
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	20.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	B31-14	Client:	Sound Environmental Strategies
Date Received:	12/03/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-15
Date Analyzed:	12/07/07	Data File:	711309-15.033
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	82	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.18

Analysis For Total Metals By EPA Method 200.8

Client ID:	B32-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-17
Date Analyzed:	12/04/07	Data File:	711309-17.031
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	118	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	B32-11	Client:	Sound Environmental Strategies
Date Received:	12/03/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-20
Date Analyzed:	12/07/07	Data File:	711309-20.038
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	78	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	21.8

Analysis For Total Metals By EPA Method 200.8

Client ID:	B32-15	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-21
Date Analyzed:	12/04/07	Data File:	711309-21.033
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	87	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.42

Analysis For Total Metals By EPA Method 200.8

Client ID:	B33-01	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-23
Date Analyzed:	12/04/07	Data File:	711309-23.063
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.87

Analysis For Total Metals By EPA Method 200.8

Client ID:	B33-09	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-25
Date Analyzed:	12/04/07	Data File:	711309-25.064
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.98

Analysis For Total Metals By EPA Method 200.8

Client ID:	B33-16	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-26
Date Analyzed:	12/04/07	Data File:	711309-26.065
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.28

Analysis For Total Metals By EPA Method 200.8

Client ID:	B34-05	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-29
Date Analyzed:	12/04/07	Data File:	711309-29.066
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	87	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	B34-09	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-30
Date Analyzed:	12/04/07	Data File:	711309-30.067
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	91	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.35

Analysis For Total Metals By EPA Method 200.8

Client ID:	B34-16	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	711309-31
Date Analyzed:	12/04/07	Data File:	711309-31.068
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.24

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	I7-454 mb
Date Analyzed:	12/04/07	Data File:	I7-454 mb.008
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	94	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/03/07	Lab ID:	I7-456 mb
Date Analyzed:	12/04/07	Data File:	I7-456 mb.060
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B30-07	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-03 1/5
Date Analyzed:	12/07/07	Data File:	120717.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	82	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B30-13	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-05 1/5
Date Analyzed:	12/07/07	Data File:	120718.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	80	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B31-11.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-14 1/5
Date Analyzed:	12/07/07	Data File:	120719.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	88	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.26
Acenaphthylene	0.011
Acenaphthene	0.022
Fluorene	0.039
Phenanthrene	0.14
Anthracene	0.023
Fluoranthene	0.085
Pyrene	0.089
Benz(a)anthracene	0.028
Chrysene	0.037
Benzo(a)pyrene	0.043
Benzo(b)fluoranthene	0.051
Benzo(k)fluoranthene	0.016
Indeno(1,2,3-cd)pyrene	0.041
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.039

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B31-14	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-15 1/5
Date Analyzed:	12/07/07	Data File:	120703.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	81	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B32-11	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-20 1/5
Date Analyzed:	12/07/07	Data File:	120704.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	92	50	150
Benzo(a)anthracene-d12	79	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.042
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.036
Anthracene	<0.01
Fluoranthene	0.027
Pyrene	0.026
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	0.010
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B32-15	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-21 1/5
Date Analyzed:	12/07/07	Data File:	120705.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	98	50	150
Benzo(a)anthracene-d12	84	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B33-09	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-25 1/5
Date Analyzed:	12/07/07	Data File:	120706.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	50	150
Benzo(a)anthracene-d12	82	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.010
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.029
Anthracene	<0.01
Fluoranthene	0.011
Pyrene	0.013
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B33-16	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-26 1/5
Date Analyzed:	12/07/07	Data File:	120707.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	84	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.013
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B34-09	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-30 1/500
Date Analyzed:	12/08/07	Data File:	120726.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	0 ds	50	150
Benzo(a)anthracene-d12	0 ds	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	2.7
Acenaphthylene	<1
Acenaphthene	6.0
Fluorene	18
Phenanthrene	120
Anthracene	25
Fluoranthene	78
Pyrene	89
Benz(a)anthracene	27
Chrysene	31
Benzo(a)pyrene	29
Benzo(b)fluoranthene	29
Benzo(k)fluoranthene	9.6
Indeno(1,2,3-cd)pyrene	16
Dibenz(a,h)anthracene	2.9
Benzo(g,h,i)perylene	17

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B34-16	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	711309-31 1/5
Date Analyzed:	12/07/07	Data File:	120708.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	77	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/30/07	Lab ID:	071938mb1/5
Date Analyzed:	12/06/07	Data File:	120605.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	86	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711309

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711309-15 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	1.18	1.20	2	0-20

Laboratory Code: 711309-15 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	1.18	109	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	108	70-130

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711309

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 711391-10 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	<0.01	<0.01	nm

Laboratory Code: 711391-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	81	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	78	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	80	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	78	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	82	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	73	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	81	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	81	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	76	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	85	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	87	37-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	83	28-134
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	72	55-115
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	77	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	80	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	82	60-105

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711309

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	96	98	66-106	2
Acenaphthylene	mg/kg (ppm)	0.17	90	92	63-110	2
Acenaphthene	mg/kg (ppm)	0.17	93	95	65-108	2
Fluorene	mg/kg (ppm)	0.17	95	98	63-112	3
Phenanthrene	mg/kg (ppm)	0.17	95	96	64-107	1
Anthracene	mg/kg (ppm)	0.17	87	89	64-107	2
Fluoranthene	mg/kg (ppm)	0.17	96	96	66-113	0
Pyrene	mg/kg (ppm)	0.17	96	97	66-111	1
Benz(a)anthracene	mg/kg (ppm)	0.17	87	89	55-103	2
Chrysene	mg/kg (ppm)	0.17	97	98	59-109	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	89	53-107	9
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	99	99	61-112	0
Benzo(a)pyrene	mg/kg (ppm)	0.17	84	86	60-111	2
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	87	90	59-111	3
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	93	95	56-114	2
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	92	94	60-110	2

Note: The initial calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

711309

SAMPLE CHAIN OF CUSTODY ME 11-21-07

BE4

Send Report To Chris Carter cc: E Rothman / D. Buser
Company SES
Address 2400 Airport Way S. Ste 200
City, State, ZIP Seattle, WA 98134
Phone # 206-306-1900 Fax # 206 306 1907

SAMPLERS (*signature*)

PROJECT NAME/NO. Wesmar / 0398-002-03

PO #

REMARKS Hold all samples until further notice

GEMS [✓ Y] / N

Page # 1 of 3

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED									
Sample ID	Sample Location	Sample Depth	Lab ID	Time ~~Date~~ PK Sampled	Date ~~Time~~ PK Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	As ~~RCRA 8 Metals~~	PCB	PCP	Notes
B30-02		2'	01	0935	20071120	Soil	1						X			
B30-04		4'	02	0940												
B30-07		7'	03	0945								X	X			
B30-10		10'	04	0950												
B30-13		13'	05	1020								X	X			
B30-17		17'	06	1025												
B30-20		20'	07	1030												
B30-23		23'	08	1050												
B30-26		26	09	1115												
B30-30		30'	10	1145												
B31-02		2	11	1245												
B31-04		4	12	1255									X			
B31-07		7	13	1300	↓	↓	↓									

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:	Cory League	SES	11/21/07 ~~1542~~	1542
Received by:	Michael Erdahl	F&BI	✓	✓
Relinquished by:				
Received by:		Samples received at	4 °C	

FORMS\COC\SESGEMSR1.DOC (Revision 1)

711309
[redacted]

SAMPLE CHAIN OF CUSTODY ME 11-21-07
[redacted]

BI4

Page # 2 of 3

Send Report To
Company
Address See Page One
City, State, ZIP
Phone # Fax #

SAMPLERS (signature)

PROJECT NAME/NO.

PO #

REMARKS

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

							ANALYSIS REQUESTED											
Sample ID	Location ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	Silica Gel by 3630	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	PCBs by 8082	As only			Notes
B31-11.5		14	20071120	1310	Soil	1						X			X			
B31-14		15		1315								X			X			
B31-18		16		1320														
B32-02		17		1358											X			
B32-04		18		1405														
B32-07		19		1410														
B32-11		20		1420								X			X			
B32-15		21		1420								X			X			
B32-19		22		1425														
B33-01		23		1510											X			
B33-05		24	↓	1515	↓	↓						~~X~~			~~X~~			

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:	Corey League	SES	11/21/07	1542
Received by:	Michael Erdahl	F&Bru	✓	✓
Relinquished by:				
Received by:		Samples received at		4 °C

FORMS\COC\COC.DOC

711309 [redacted]

SAMPLE CHAIN OF CUSTODY ME 11-21-07 [redacted]

BI4

Page # 3 of 3

Send Report To See Page One
Company
Address
City, State, ZIP
Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO.

PO #

REMARKS

GEMS Y / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	As		Notes
B33-09		9	25	20071120	1520	Soil	1					X		X		
B33-16		16'	26	↓	1530	↓	↓					X		X		
B33-22		22'	27		1538											
B34-02		2'	28		1605											
B34-05		5'	29		1610									X		
B34-09		9	30		1615							X		X		
B34-16		16	31		1625							X		X		
B34-22		22'	32		1628											

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:	Cory League	SES	11/21/07	1542
Received by:	Michael Erdahl	FBInc	L	L
Relinquished by:				
Received by:		Samples received at	4 °C	

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #711310

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 12, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on November 21, 2007 from the SOU_0398-002-03_20071121, F&BI 711310 project. There are 31 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: David Buser, Erin Rothman, Brandi Reyna, Pete Kingston
SOU1212R.DOC

FRIEDMAN & BRUYA, INC.
ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 21, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20071121, F&BI 711310 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
711310-01	B35-02
711310-02	B35-06
711310-03	B35-09
711310-04	B35-17.5
711310-05	B36-02
711310-06	B36-05
711310-07	B36-07
711310-08	B36-12
711310-09	B36-14
711310-10	B36-16
711310-11	B36-17
711310-12	B37-0.75
711310-13	B37-02.5
711310-14	B37-09
711310-15	B37-12
711310-16	B37-16
711310-17	B37-17
711310-18	B38-02
711310-19	B38-07
711310-20	B38-12
711310-21	B38-15
711310-22	B38-18
711310-23	B38-21
711310-24	B39-03
711310-25	B39-05.5
711310-26	B39-10.5
711310-27	B39-14
711310-28	B39-17
711310-29	B40-03
711310-30	B40-04.5
711310-31	B40-05.25
711310-32	B40-06
711310-33	B40-11.5
711310-34	B40-17

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	B35-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-01
Date Analyzed:	12/07/07	Data File:	711310-01.067
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.73

Analysis For Total Metals By EPA Method 200.8

Client ID:	B35-09	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-03
Date Analyzed:	12/07/07	Data File:	711310-03.068
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.82

Analysis For Total Metals By EPA Method 200.8

Client ID:	B35-17.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-04
Date Analyzed:	12/07/07	Data File:	711310-04.069
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	79	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.80

Analysis For Total Metals By EPA Method 200.8

Client ID:	B36-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-05
Date Analyzed:	12/07/07	Data File:	711310-05.072
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	79	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	16.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	B36-07	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-07
Date Analyzed:	12/07/07	Data File:	711310-07.074
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	73	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.94

Analysis For Total Metals By EPA Method 200.8

Client ID:	B36-14	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-09
Date Analyzed:	12/07/07	Data File:	711310-09.075
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	77	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.27

Analysis For Total Metals By EPA Method 200.8

Client ID:	B37-0.75	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-12
Date Analyzed:	12/07/07	Data File:	711310-12.076
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	76	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	15.2

Analysis For Total Metals By EPA Method 200.8

Client ID:	B37-02.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-13
Date Analyzed:	12/07/07	Data File:	711310-13.077
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	76	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.52

Analysis For Total Metals By EPA Method 200.8

Client ID:	B37-12	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-15
Date Analyzed:	12/07/07	Data File:	711310-15.078
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.11

Analysis For Total Metals By EPA Method 200.8

Client ID:	B38-02	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-18
Date Analyzed:	12/07/07	Data File:	711310-18.081
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	82	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.77

Analysis For Total Metals By EPA Method 200.8

Client ID:	B38-07	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-19
Date Analyzed:	12/07/07	Data File:	711310-19.082
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.51

Analysis For Total Metals By EPA Method 200.8

Client ID:	B38-12	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-20
Date Analyzed:	12/07/07	Data File:	711310-20.083
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.86

Analysis For Total Metals By EPA Method 200.8

Client ID:	B39-05.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-25
Date Analyzed:	12/07/07	Data File:	711310-25.085
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	10.0

Analysis For Total Metals By EPA Method 200.8

Client ID:	B39-10.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-26
Date Analyzed:	12/07/07	Data File:	711310-26.086
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.14

Analysis For Total Metals By EPA Method 200.8

Client ID:	B40-05.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-31
Date Analyzed:	12/07/07	Data File:	711310-31.087
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	76	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.24

Analysis For Total Metals By EPA Method 200.8

Client ID:	B40-11.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	711310-33
Date Analyzed:	12/07/07	Data File:	711310-33.088
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.74

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	I7-461 mb
Date Analyzed:	12/07/07	Data File:	I7-461 mb.044
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	12/07/07	Lab ID:	I7-462 mb
Date Analyzed:	12/07/07	Data File:	I7-462 mb.070
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B38-07	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	711310-19 1/5
Date Analyzed:	12/06/07	Data File:	120531.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	50	150
Benzo(a)anthracene-d12	90	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.019
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.039
Anthracene	<0.01
Fluoranthene	0.052
Pyrene	0.057
Benz(a)anthracene	0.023
Chrysene	0.030
Benzo(a)pyrene	0.031
Benzo(b)fluoranthene	0.033
Benzo(k)fluoranthene	0.012
Indeno(1,2,3-cd)pyrene	0.026
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.027

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B38-12	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	711310-20 1/5
Date Analyzed:	12/06/07	Data File:	120532.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	95	50	150
Benzo(a)anthracene-d12	73	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.16
Acenaphthylene	0.021
Acenaphthene	0.011
Fluorene	0.015
Phenanthrene	0.060
Anthracene	0.010
Fluoranthene	0.043
Pyrene	0.046
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B39-05.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	711310-25 1/5
Date Analyzed:	12/06/07	Data File:	120533.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	88	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.035
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.033
Anthracene	<0.01
Fluoranthene	0.054
Pyrene	0.052
Benz(a)anthracene	0.022
Chrysene	0.027
Benzo(a)pyrene	0.022
Benzo(b)fluoranthene	0.032
Benzo(k)fluoranthene	0.012
Indeno(1,2,3-cd)pyrene	0.019
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.020

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B39-10.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	711310-26 1/5
Date Analyzed:	12/06/07	Data File:	120534.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	87	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B40-05.25	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	711310-31 1/500
Date Analyzed:	12/06/07	Data File:	120536.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	0 ds	50	150
Benzo(a)anthracene-d12	0 ds	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	28
Acenaphthylene	<1
Acenaphthene	5.6
Fluorene	10
Phenanthrene	40
Anthracene	8.6
Fluoranthene	18
Pyrene	20
Benz(a)anthracene	5.7
Chrysene	6.5
Benzo(a)pyrene	5.4
Benzo(b)fluoranthene	4.4
Benzo(k)fluoranthene	2.0
Indeno(1,2,3-cd)pyrene	3.1
Dibenz(a,h)anthracene	<1
Benzo(g,h,i)perylene	2.9

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B40-11.5	Client:	Sound Environmental Strategies
Date Received:	11/21/07	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	711310-33 1/5
Date Analyzed:	12/06/07	Data File:	120535.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	83	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.074
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	0.017
Phenanthrene	0.062
Anthracene	0.011
Fluoranthene	0.026
Pyrene	0.030
Benz(a)anthracene	0.011
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071121
Date Extracted:	11/29/07	Lab ID:	07-1928mb2 1/5
Date Analyzed:	12/06/07	Data File:	120530.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	111	50	150
Benzo(a)anthracene-d12	90	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711396-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	4.37	4.20	4	0-20

Laboratory Code: 711396-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	4.37	93 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	97	70-130

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711310-15 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	4.11	5.12	22 a	0-20

Laboratory Code: 711310-15 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	4.11	96 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	112	70-130

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 711364-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	0.012	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	0.022	0.011	67 h
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	0.041	0.017	83 h
Pyrene	mg/kg (ppm)	0.046	0.019	83 h
Benz(a)anthracene	mg/kg (ppm)	0.039	0.018	74 h
Chrysene	mg/kg (ppm)	0.056	0.024	80 h
Benzo(b)fluoranthene	mg/kg (ppm)	0.082	0.031	90 h
Benzo(k)fluoranthene	mg/kg (ppm)	0.046	0.019	83 h
Benzo(a)pyrene	mg/kg (ppm)	0.079	0.030	90 h
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.079	0.032	85 h
Dibenz(a,h)anthracene	mg/kg (ppm)	0.014	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	0.068	0.028	83 h

Laboratory Code: 711364-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	0.012	88	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	89	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	84	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	87	57-113
Phenanthrene	mg/kg (ppm)	0.17	0.022	81	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	103	42-132
Fluoranthene	mg/kg (ppm)	0.17	0.041	98	45-145
Pyrene	mg/kg (ppm)	0.17	0.046	93	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	0.039	69	17-134
Chrysene	mg/kg (ppm)	0.17	0.056	85	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.082	50	37-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.046	97	28-134
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.079	75	55-115
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.079	97	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.014	89	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	0.068	75	60-105

Date of Report: 12/12/07
Date Received: 11/21/07
Project: SOU_0398-002-03_20071121, F&BI 711310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	91	93	66-106	2
Acenaphthylene	mg/kg (ppm)	0.17	89	91	63-110	2
Acenaphthene	mg/kg (ppm)	0.17	90	91	65-108	1
Fluorene	mg/kg (ppm)	0.17	92	93	63-112	1
Phenanthrene	mg/kg (ppm)	0.17	91	93	64-107	2
Anthracene	mg/kg (ppm)	0.17	84	84	64-107	0
Fluoranthene	mg/kg (ppm)	0.17	93	95	66-113	2
Pyrene	mg/kg (ppm)	0.17	93	95	66-111	2
Benz(a)anthracene	mg/kg (ppm)	0.17	86	87	55-103	1
Chrysene	mg/kg (ppm)	0.17	93	94	59-109	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	95	97	53-107	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	93	94	61-112	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	81	82	60-111	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	87	86	59-111	1
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	90	91	56-114	1
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	89	90	60-110	1

Note: The initial calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

711310

SAMPLE CHAIN OF CUSTODY

ME 11-21-07

BI4/VS1

Page # 1 of 3

Send Report To Chris Carter cc: D.Baker E Rothman
Company SES
Address 2400 Airport Way S. Ste 200
City, State, ZIP Seattle, WA 98134
Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (signature)

PROJECT NAME/NO.
Wesmar
0398-002-03

PO #

REMARKS
Hold all samples
except B35-05 VOCs

GEMS [✓ Y] / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	Chlorinated VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	As		Notes
B35-02		2	01	20071121	0825	Soil	1							X		* do not
B35-06		6	02 A-E		0830		5	X	X	X	X					analyze per excel
B35-09		9	03		0837		1							X		sheet
B35-17.5		17.5	04		0843		1							X		
B36-02		2	05		0855									X		
B36-05		5	06		0857											
B36-07		7	07		0859									X		
B36-12		12	08		0902											
B36-14		14	09		0905									X		
B36-16		16	10		0909											
B36-17		17	11		0913											
B37-0.75		0.75	12		0929									X		
B37-02.5		02.5	13	↓	0927	↓	↓							X		

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:	Cory League	SES	11/21/07	1545
Received by:	Michael Erdahl	F&BI	⌄	⌄
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\SESGEMSR1.DOC (Revision 1)

711310

BI4 / USI

SAMPLE CHAIN OF CUSTODY ME 11-21-07

Page # 2 of 3

Send Report To See Page 1

Company

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO. DR

PO #

REMARKS

GEMS Y / N

TURNAROUND TIME

☐ Standard (2 Weeks)

☐ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	As only		Notes
B37-09		9	14	20071121	0930	Soil	1									
B37-12		12	15		0935									ⓧ		
B37-16		16	16		0940											
B37-17		17	17		0945											
B38-02		2	18		1007									ⓧ		
B38-07		7	19		1010							ⓧ		ⓧ		
B38-12		12	20		1014							ⓧ		ⓧ		
B38-15		15	21		1024											
B38-18		18	22		1032											
B-38-21		21	23		1040											
B39-03		3	24		1108											
B39-05.5		5.5	25		1112							ⓧ		ⓧ		
B39-10.5		10.5	26	↓	1118	↓	↓					ⓧ		ⓧ		

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:		Cory League	SES	11/21/07	1545
Received by:		Michael Erdahl	FB	↓	↓
Relinquished by:					
Received by:			Samples received at 4 °C		

FORMS\COC\SESGEMSR1.DOC (Revision 1)

711310

SAMPLE CHAIN OF CUSTODY

ME 11-21-07

BI4/USI

Page # 3 of 3

Send Report To

Company

Address See Page

City, State, ZIP

Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO. OR

PO #

REMARKS

GEMS Y / N

TURNAROUND TIME

☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL

☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	As only		Notes
B39-14		14	27	20071121	1127	Soil	1									
B39-17		17	28		1140											
B40-03		3	29		1154											
B40-04.5		4.5	30		1159											
B40-05.25		5.25	31		1202							X		X		
B40-06		6	32		1203											
B40-11.5		11.5	33		1212							X		X		
B40-17		17	34	↓	1220	↓	↓									

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Relinquished by:	Cory League	SES	11/21/07	1545
Received by:	Michael Erdahl	FGB		
Relinquished by:				
Received by:		Samples received at 4 °C		

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #711323

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 12, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on November 26, 2007 from the SOU_0398-002-03_20071126, F&BI 711323 project. There are 47 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: David Buser, Erin Rothman, Brandi Reyna, Pete Kingston
SOU1212R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on November 26, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20071126, F&BI 711323 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
711323-01	B41-01
711323-02	B41-03
711323-03	B41-07
711323-04	B41-11
711323-05	B41-15
711323-06	B41-18
711323-07	B41-22
711323-08	B42-01
711323-09	B42-03
711323-10	B42-06
711323-11	B42-09
711323-12	B42-12.5
711323-13	B42-16
711323-14	B42-19
711323-15	B43-01
711323-16	B43-03
711323-17	B43-07
711323-18	B43-10
711323-19	B43-13
711323-20	B43-17
711323-21	B43-20
711323-22	B43-23
711323-23	B44-01
711323-24	B44-03
711323-25	B44-07
711323-26	B44-11
711323-27	B44-16
711323-28	B44-19
711323-29	B44-22
711323-30	B45-01
711323-31	B45-03
711323-32	B45-07
711323-33	B45-09
711323-34	B45-11.5
711323-35	B45-15
711323-36	B45-19
711323-37	B45-22
711323-38	RR07-0.5

CASE NARRATIVE (continued)

Laboratory ID	Sound Environmental Strategies
711323-39	RR07-01.25
711323-40	RR07-02
711323-41	RR08-0.5
711323-42	RR08-01.25
711323-43	RR08-02
711323-44	RR09-0.5
711323-45	RR09-01.25
711323-46	RR09-02
711323-47	RR10-0.5
711323-48	RR10-01.5
711323-49	RR10-02.0

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 200.8

Client ID:	B41-01	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-01
Date Analyzed:	12/07/07	Data File:	711323-01.089
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	9.17

Analysis For Total Metals By EPA Method 200.8

Client ID:	B41-03	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-02
Date Analyzed:	12/07/07	Data File:	711323-02.090
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	73	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.10

Analysis For Total Metals By EPA Method 200.8

Client ID:	B41-18	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-06
Date Analyzed:	12/07/07	Data File:	711323-06.091
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	73	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	B42-06	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-10
Date Analyzed:	12/07/07	Data File:	711323-10.092
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	79	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	B42-12.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-12
Date Analyzed:	12/07/07	Data File:	711323-12.093
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	77	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.11

Analysis For Total Metals By EPA Method 200.8

Client ID:	B43-01	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-15
Date Analyzed:	12/07/07	Data File:	711323-15.094
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	7.95

Analysis For Total Metals By EPA Method 200.8

Client ID:	B43-10	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-18
Date Analyzed:	12/07/07	Data File:	711323-18.096
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.12

Analysis For Total Metals By EPA Method 200.8

Client ID:	B43-17	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-20
Date Analyzed:	12/07/07	Data File:	711323-02.099
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	66.0

Analysis For Total Metals By EPA Method 200.8

Client ID:	B44-01	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-23
Date Analyzed:	12/07/07	Data File:	711323-23.100
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	45.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	B44-11	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-26
Date Analyzed:	12/07/07	Data File:	711323-26.101
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	70	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.02

Analysis For Total Metals By EPA Method 200.8

Client ID:	B44-16	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-27
Date Analyzed:	12/07/07	Data File:	711323-27.104
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	B45-01	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-30
Date Analyzed:	12/07/07	Data File:	711323-30.105
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	71	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.12

Analysis For Total Metals By EPA Method 200.8

Client ID:	B45-11.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-34
Date Analyzed:	12/07/07	Data File:	711323-34.107
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	10.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	B45-15	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-35
Date Analyzed:	12/07/07	Data File:	711323-35.108
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR07-0.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-38
Date Analyzed:	12/07/07	Data File:	711323-38.109
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125
Bismuth	102	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.00
Lead	57.1

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR07-01.25	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-39
Date Analyzed:	12/07/07	Data File:	711323-39.110
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	71	60	125
Bismuth	96	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.95
Lead	157

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR07-02	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-40
Date Analyzed:	12/07/07	Data File:	711323-40.111
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	73	60	125
Bismuth	98	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.49
Lead	9.58

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR08-0.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-41
Date Analyzed:	12/07/07	Data File:	711323-41.112
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125
Bismuth	94	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.10
Lead	52.7

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR08-01.25	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-42
Date Analyzed:	12/07/07	Data File:	711323-42.113
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	70	60	125
Bismuth	96	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.62
Lead	9.26

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR08-02	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-43
Date Analyzed:	12/07/07	Data File:	711323-43.114
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125
Bismuth	96	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.49
Lead	10.1

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR09-0.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-44
Date Analyzed:	12/07/07	Data File:	711323-44.115
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	70	60	125
Bismuth	92	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.32
Lead	3.50

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR09-01.25	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-45
Date Analyzed:	12/07/07	Data File:	711323-45.116
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125
Bismuth	95	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.9
Lead	103

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR09-02	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-46
Date Analyzed:	12/07/07	Data File:	711323-46.118
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125
Bismuth	101	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	8.09
Lead	110

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR10-0.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-47
Date Analyzed:	12/07/07	Data File:	711323-47.119
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125
Bismuth	94	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	32.2
Lead	276

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR09-02	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-48
Date Analyzed:	12/07/07	Data File:	711323-48.120
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	70	60	125
Bismuth	92	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.52
Lead	28.9

Analysis For Total Metals By EPA Method 200.8

Client ID:	RR10-0.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	711323-49
Date Analyzed:	12/07/07	Data File:	711323-49.121
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125
Bismuth	97	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.20
Lead	11.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	I7-462 mb
Date Analyzed:	12/07/07	Data File:	I7-462 mb.070
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/07/07	Lab ID:	I7-463 mb
Date Analyzed:	12/07/07	Data File:	I7-463 mb.097
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	75	60	125
Bismuth	98	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B41-03	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-02 1/5
Date Analyzed:	12/06/07	Data File:	120614.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	111	50	150
Benzo(a)anthracene-d12	79	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B41-18	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-06 1/5
Date Analyzed:	12/06/07	Data File:	120615.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	107	50	150
Benzo(a)anthracene-d12	76	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B42-01	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-08 1/50
Date Analyzed:	12/11/07	Data File:	121122.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	288 ds	50	150
Benzo(a)anthracene-d12	110	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.41
Anthracene	0.11
Fluoranthene	0.36
Pyrene	0.46
Benz(a)anthracene	0.20
Chrysene	0.27
Benzo(a)pyrene	0.27
Benzo(b)fluoranthene	0.34
Benzo(k)fluoranthene	0.12
Indeno(1,2,3-cd)pyrene	0.35
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	0.28

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B42-06	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-10 1/5
Date Analyzed:	12/06/07	Data File:	120618.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	121	50	150
Benzo(a)anthracene-d12	66	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B42-12.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-12 1/5
Date Analyzed:	12/06/07	Data File:	120619.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	113	50	150
Benzo(a)anthracene-d12	77	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B43-10	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-18 1/5
Date Analyzed:	12/06/07	Data File:	120620.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	112	50	150
Benzo(a)anthracene-d12	70	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B43-17	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-20 1/5
Date Analyzed:	12/07/07	Data File:	120621.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	120	50	150
Benzo(a)anthracene-d12	76	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.020
Anthracene	<0.01
Fluoranthene	0.012
Pyrene	0.014
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B44-11	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-26 1/5
Date Analyzed:	12/07/07	Data File:	120710.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	106	50	150
Benzo(a)anthracene-d12	87	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B44-16	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-27 1/5
Date Analyzed:	12/07/07	Data File:	120714.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	83	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B45-11.5	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-34 1/5
Date Analyzed:	12/07/07	Data File:	120716.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	104	50	150
Benzo(a)anthracene-d12	90	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.034
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	0.014
Phenanthrene	0.090
Anthracene	0.018
Fluoranthene	0.10
Pyrene	0.12
Benz(a)anthracene	0.041
Chrysene	0.047
Benzo(a)pyrene	0.044
Benzo(b)fluoranthene	0.044
Benzo(k)fluoranthene	0.014
Indeno(1,2,3-cd)pyrene	0.027
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.029

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B45-15	Client:	Sound Environmental Strategies
Date Received:	11/26/07	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	711323-35 1/5
Date Analyzed:	12/07/07	Data File:	120715.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	77	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071126
Date Extracted:	12/03/07	Lab ID:	071951 mb 1/5
Date Analyzed:	12/05/07	Data File:	120432.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	82	50	150
Benzo(a)anthracene-d12	91	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 12/12/07
Date Received: 11/26/07
Project: SOU_0398-002-03_20071126, F&BI 711323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711310-15 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	4.11	5.12	22 a	0-20

Laboratory Code: 711310-15 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	4.11	96 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	112	70-130

Date of Report: 12/12/07
Date Received: 11/26/07
Project: SOU_0398-002-03_20071126, F&BI 711323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711323-26 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	2.02	1.85	9	0-20
Lead	mg/kg (ppm)	1.03	<1	nm	0-20

Laboratory Code: 711323-26 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	2.02	108 b	50-150
Lead	mg/kg (ppm)	50	1.03	102	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	115	70-130
Lead	mg/kg (ppm)	50	105	70-130

Date of Report: 12/12/07
Date Received: 11/26/07
Project: SOU_0398-002-03_20071126, F&BI 711323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 711323-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	<0.01	<0.01	nm

Laboratory Code: 711323-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	88	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	83	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	85	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	86	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	85	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	85	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	85	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	85	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	75	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	86	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	76	37-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	86	28-134
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	79	55-115
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	100	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	79	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	78	60-105

Date of Report: 12/12/07
Date Received: 11/26/07
Project: SOU_0398-002-03_20071126, F&BI 711323

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	90	92	66-106	2
Acenaphthylene	mg/kg (ppm)	0.17	100	103	63-110	3
Acenaphthene	mg/kg (ppm)	0.17	90	92	65-108	2
Fluorene	mg/kg (ppm)	0.17	92	91	63-112	1
Phenanthrene	mg/kg (ppm)	0.17	90	90	64-107	0
Anthracene	mg/kg (ppm)	0.17	77	81	64-107	5
Fluoranthene	mg/kg (ppm)	0.17	88	95	66-113	8
Pyrene	mg/kg (ppm)	0.17	88	95	66-111	8
Benz(a)anthracene	mg/kg (ppm)	0.17	89	93	55-103	4
Chrysene	mg/kg (ppm)	0.17	93	94	59-109	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	91	90	53-107	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	101	101	61-112	0
Benzo(a)pyrene	mg/kg (ppm)	0.17	91	94	60-111	3
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	78	78	59-111	0
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	76	77	56-114	1
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	78	78	60-110	0

Note: The initial calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

711323

SAMPLE CHAIN OF CUSTODY

ME 11/26/07

BI4

Page # 1 of 5

Send Report To Chris Carter

Company SES

Address 2400 Airport Way S, Ste 200

City, State, ZIP Seattle, WA 98134

Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (*signature*)

PROJECT NAME/NO. Wesmar / 0398-002-03

PO #

REMARKS Hold all samples til further notice

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	As					Notes
B41-01	01	11/21/07	0910	Soil	1							⊗					Hold
B41-03	02		0915							⊗		⊗					
B41-07	03		0920														
B41-11	04		0925														
B41-15	05		0935														
B41-18	06		0955							⊗		⊗					
B41-22	07		1000														
B42-01	08		1030							⊗							
B42-03	09		1035														
B42-06	10		1040							⊗		⊗					

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:	Andrea Liljegren	SES	11/26/07	
Received by:	Nhan Phan	FeBI	11/26/07	4:30
Relinquished by:				
Received by:		Samples received at 6 °C		

FORMS\COC\COC.DOC

711323 [redacted]

SAMPLE CHAIN OF CUSTODY

ME 11/26/07 [redacted]

BI4

Page # 2 of 5

Send Report To Chris Carter
Company SES
Address 8460 Airport Way S. Ste 200
City, State, ZIP Seattle, WA 98134
Phone # 206-366-1900 Fax # 206-366-1907

SAMPLERS (*signature*)

PROJECT NAME/NO. Wesmar / 0398-002-03

PO #

REMARKS
Hold all samples til further notice

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☑ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	As						Notes
B42-09	11	11/21/07	1055	Soil	1													Hold
B42-12.5	12		1059							X		X						
B42-16	13		1105															
B42-19	14		1110															
B43-01	15		1240									X						
B43-03	16		1245															
B43-07	17		1255															
B43-10	18		1305							X		X						
B43-13	19		1315															
B43-17	20		1320							X		X						

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:		Andrea Liljegren	SES	11/26/07	
Received by:		Nhan Phan	FeBI	11/26/07	4:30
Relinquished by:					
Received by:			Samples received at 6 °C		

FORMS\COC\COC.DOC

711323
[redacted]

SAMPLE CHAIN OF COUSTODY

ME 11/26/07
[redacted]

BI 4

Page # 3 of 5

Send Report To Chris Carter
Company SES
Address 2400 Airport Way S. St 200
City, State, ZIP Seattle, WA 98134
Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (*signature*)

PROJECT NAME/NO. Wesmar/0398-002-03

PO #

REMARKS Hold all samples til further notice

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	As only					Notes
B43-20	21	11/21/07	1325	Soil	1												Hold
B43-23	22		1330														
B44-01	23		1340									X					
B44-03	24		1345														
B44-07	25		1350														
B44-11	26		1355							X		X					
B44-16	27		1405							X		X					
B44-19	28		1410														
B44-22	29		14:15														
B45-01	30		1420									X					

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Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Andrea Liljegren	SES	11/26/07	
Received by:		Nhan Phan	FeBI	11/26/07	4:30
Relinquished by:					
Received by:		Samples received at 6 °C			

FORMS\COC\COC.DOC

711323

ME 11/26/07

BI4

SAMPLE CHAIN OF CUSTODY

Page # 4 of 5

Send Report To Chris Carter
Company SES
Address 2400 Airport Way S. Ste 200
City, State, ZIP Seattle, WA 98134
Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (*signature*)

PROJECT NAME/NO. Wesmar / 0398-002-03

PO #

REMARKS
Hold all samples til further notice

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED											Notes
						TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	As	Pb				
B45-03	31	11/21/07	1425	Soil	1												Hold
B45-07	32		1430														
B45-09	33		1435														
B45-11.5	34		1440							X		X					
B45-15	35		1445							X		X					
B45-19	36		1450														
B45-22	37		1455														
RR07-0.5	38		1320									X	X				
RR07-01.25	39		1325									X	X				
RR07-02	40		1330									X	X				

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:		Andrea Liljegren	SES	11/26/07	4:30
Received by:		Nhan Phan	FeBI	11/26/07	✓
Relinquished by:					
Received by:			Samples received at 6 °C		

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711323

ME 11/26/07

BI 4

SAMPLE CHAIN OF CUSTODY

Page # 5 of 5

Send Report To Chris Carter
Company SES
Address 2400 Airport Way S. Ste 200
City, State, ZIP Seattle, WA 98134
Phone # 206-306-1900 Fax # 206-306-1907

SAMPLERS (*signature*)

PROJECT NAME/NO.	PO #
Wesmar / 0318-062-03	

REMARKS

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	As, Pb					Notes
RR08-0.5	41	11/21/07	1335	Soil	1							X					Hold
RR08-01.25	42		1340									X					
RR08-02	43		1345									X					
RR09-0.5	44		1350									X					
RR09-01.25	45		1355									X					
RR09-02	46		1400									X					
RR10-0.5	47	11-21-07	13:58									X					NP 11-27-07 Added in lab
RR10-01.5	48		13:53									X					
RR10-02.0	49		1355									X					

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:	Andrea Liljegren	SES	11/26/07	4:30
Received by:	Nhan Phan	FeBI	11/26/07	V
Relinquished by:				
Received by:		Samples received at 6 °C		

FORMS\COC\COC.DOC

Friedman & Bruya, Inc. # 711391

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 12, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on November 29, 2007 from the SOU_0398-002-03_20071129, F&BI 711391 project. There are 29 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Erin Rothman, David Buser, Brandi Reyna, Pete Kingston
SOU1212R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 29, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20071129, F&BI 711391 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
711391-01	B46-05
711391-02	B46-08
711391-03	B46-10.5
711391-04	B46-13
711391-05	B46-16
711391-06	B47-05.5
711391-07	B47-08
711391-08	B47-11.5
711391-09	B47-13
711391-10	B47-16
711391-11	B48-06
711391-12	B48-08
711391-13	B48-10
711391-14	B48-15
711391-15	B48-17.5
711391-16	B48-20.5
711391-17	B49-05.5
711391-18	B49-08.5
711391-19	B49-10.5
711391-20	B49-15.5

All quality control requirements were acceptable.

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391
Date Extracted: 11/30/07
Date Analyzed: 11/30/07

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
B49-10.5 711391-19	3	92
Method Blank	<2	109

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391
Date Extracted: 11/30/07
Date Analyzed: 12/01/07

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 67-127)
B49-10.5 711391-19	<50	<250	86
Method Blank	<50	<250	91

Analysis For Total Metals By EPA Method 200.8

Client ID:	B46-05	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-01
Date Analyzed:	12/04/07	Data File:	711391-01.050
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.00

Analysis For Total Metals By EPA Method 200.8

Client ID:	B46-08	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-02
Date Analyzed:	12/04/07	Data File:	711391-02.052
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	6.98

Analysis For Total Metals By EPA Method 200.8

Client ID:	B47-05.5	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-06
Date Analyzed:	12/04/07	Data File:	711391-06.053
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	90	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.14

Analysis For Total Metals By EPA Method 200.8

Client ID:	B47-11.5	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-08
Date Analyzed:	12/04/07	Data File:	711391-08.054
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	83	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	13.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	B47-16	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-10
Date Analyzed:	12/04/07	Data File:	711391-10.055
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.04

Analysis For Total Metals By EPA Method 200.8

Client ID:	B48-06	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-11
Date Analyzed:	12/04/07	Data File:	711391-11.056
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	85	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.59

Analysis For Total Metals By EPA Method 200.8

Client ID:	B48-15	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-14
Date Analyzed:	12/04/07	Data File:	711391-14.057
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.68

Analysis For Total Metals By EPA Method 200.8

Client ID:	B49-05.5	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-17
Date Analyzed:	12/04/07	Data File:	711391-17.058
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	91	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	6.66

Analysis For Total Metals By EPA Method 200.8

Client ID:	B49-10.5	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	711391-19
Date Analyzed:	12/04/07	Data File:	711391-19.059
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	84	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.28

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-03_20071129
Date Extracted:	12/03/07	Lab ID:	I7-453 mb
Date Analyzed:	12/04/07	Data File:	I7-453 mb.034
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	87	60	125

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	B49-10.5	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/29/07	Lab ID:	711391-19
Date Analyzed:	11/30/07	Data File:	113006.D
Matrix:	Soil	Instrument:	GCMS5
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	136	32	147
1,2-Dichloroethane-d4	146	35	150
Toluene-d8	138	35	149
4-Bromofluorobenzene	160	15	196

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	Tetrachloroethene	<0.025
Chloromethane	<0.05	Dibromochloromethane	<0.05
Vinyl chloride	<0.05	1,2-Dibromoethane (EDB)	<0.05
Bromomethane	<0.5	Chlorobenzene	<0.05
Chloroethane	<0.5	Ethylbenzene	<0.05
Trichlorofluoromethane	<0.5	1,1,1,2-Tetrachloroethane	<0.05
Acetone	<0.5	m,p-Xylene	<0.1
1,1-Dichloroethene	<0.05	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon Tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.05
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.1
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.1
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.1
1,3-Dichloropropane	<0.05		

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/29/07	Lab ID:	071894 mb
Date Analyzed:	11/30/07	Data File:	112927.D
Matrix:	Soil	Instrument:	GCMS5
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	122	32	147
1,2-Dichloroethane-d4	127	35	150
Toluene-d8	125	35	149
4-Bromofluorobenzene	141	15	196

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	Tetrachloroethene	<0.025
Chloromethane	<0.05	Dibromochloromethane	<0.05
Vinyl chloride	<0.05	1,2-Dibromoethane (EDB)	<0.05
Bromomethane	<0.5	Chlorobenzene	<0.05
Chloroethane	<0.5	Ethylbenzene	<0.05
Trichlorofluoromethane	<0.5	1,1,1,2-Tetrachloroethane	<0.05
Acetone	<0.5	m,p-Xylene	<0.1
1,1-Dichloroethene	<0.05	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
trans-1,2-Dichloroethene	<0.05	Isopropylbenzene	<0.05
1,1-Dichloroethane	<0.05	Bromoform	<0.05
2,2-Dichloropropane	<0.05	n-Propylbenzene	<0.05
cis-1,2-Dichloroethene	<0.05	Bromobenzene	<0.05
Chloroform	<0.05	1,3,5-Trimethylbenzene	<0.05
2-Butanone (MEK)	<0.5	1,1,2,2-Tetrachloroethane	<0.05
1,2-Dichloroethane (EDC)	<0.05	1,2,3-Trichloropropane	<0.05
1,1,1-Trichloroethane	<0.05	2-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	4-Chlorotoluene	<0.05
Carbon Tetrachloride	<0.05	tert-Butylbenzene	<0.05
Benzene	<0.03	1,2,4-Trimethylbenzene	<0.05
Trichloroethene	<0.03	sec-Butylbenzene	<0.05
1,2-Dichloropropane	<0.05	p-Isopropyltoluene	<0.05
Bromodichloromethane	<0.05	1,3-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,4-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dichlorobenzene	<0.05
cis-1,3-Dichloropropene	<0.05	1,2-Dibromo-3-chloropropane	<0.05
Toluene	<0.05	1,2,4-Trichlorobenzene	<0.1
trans-1,3-Dichloropropene	<0.05	Hexachlorobutadiene	<0.1
1,1,2-Trichloroethane	<0.05	Naphthalene	<0.05
2-Hexanone	<0.5	1,2,3-Trichlorobenzene	<0.1
1,3-Dichloropropane	<0.05		

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B46-05	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/30/07	Lab ID:	711391-01 1/5
Date Analyzed:	12/07/07	Data File:	120709.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	146	50	150
Benzo(a)anthracene-d12	135	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.067
Acenaphthylene	<0.01
Acenaphthene	0.15
Fluorene	0.23
Phenanthrene	0.70
Anthracene	0.094
Fluoranthene	0.25
Pyrene	0.29
Benz(a)anthracene	0.074
Chrysene	0.081
Benzo(a)pyrene	0.078
Benzo(b)fluoranthene	0.078
Benzo(k)fluoranthene	0.028
Indeno(1,2,3-cd)pyrene	0.048
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.050

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B46-08	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/30/07	Lab ID:	711391-02 1/5
Date Analyzed:	12/07/07	Data File:	120720.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	148	50	150
Benzo(a)anthracene-d12	131	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.012
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	0.021
Phenanthrene	0.044
Anthracene	<0.01
Fluoranthene	0.014
Pyrene	0.017
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B47-11.5	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/30/07	Lab ID:	711391-08 1/5
Date Analyzed:	12/07/07	Data File:	120721.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	131	50	150
Benzo(a)anthracene-d12	123	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.36
Acenaphthylene	0.040
Acenaphthene	0.020
Fluorene	0.055
Phenanthrene	0.45
Anthracene	0.094
Fluoranthene	0.58
Pyrene	0.66
Benz(a)anthracene	0.26
Chrysene	0.32
Benzo(a)pyrene	0.42
Benzo(b)fluoranthene	0.44
Benzo(k)fluoranthene	0.14
Indeno(1,2,3-cd)pyrene	0.29
Dibenz(a,h)anthracene	0.054
Benzo(g,h,i)perylene	0.27

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B47-16	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/30/07	Lab ID:	711391-10 1/5
Date Analyzed:	12/07/07	Data File:	120722.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	50	150
Benzo(a)anthracene-d12	85	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B48-15	Client:	Sound Environmental Strategies
Date Received:	11/29/07	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/30/07	Lab ID:	711391-14 1/5
Date Analyzed:	12/08/07	Data File:	120725.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	99	50	150
Benzo(a)anthracene-d12	81	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.025
Anthracene	<0.01
Fluoranthene	0.013
Pyrene	0.015
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20071129
Date Extracted:	11/30/07	Lab ID:	071938mb1/5
Date Analyzed:	12/06/07	Data File:	120605.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	86	50	150

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 711269-10 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Gasoline	mg/kg (ppm)	36	37	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	20	88	70-130

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 711363-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	89	91	69-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	101	70-127

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 711287-02 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	mg/kg (ppm)	2.07	2.89	33 a	0-20

Laboratory Code: 711287-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	2.07	114 b	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	118	70-130

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 711391-19 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	<0.05	<0.05	nm
Chloromethane	mg/kg (ppm)	<0.05	<0.05	nm
Vinyl chloride	mg/kg (ppm)	<0.05	<0.05	nm
Bromomethane	mg/kg (ppm)	<0.5	<0.5	nm
Chloroethane	mg/kg (ppm)	<0.5	<0.5	nm
Trichlorofluoromethane	mg/kg (ppm)	<0.5	<0.5	nm
Acetone	mg/kg (ppm)	<0.5	<0.5	nm
1,1-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
Methylene chloride	mg/kg (ppm)	<0.5	<0.5	nm
trans-1,2-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
1,1-Dichloroethane	mg/kg (ppm)	<0.05	<0.05	nm
2,2-Dichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
cis-1,2-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
Chloroform	mg/kg (ppm)	<0.05	<0.05	nm
2-Butanone (MEK)	mg/kg (ppm)	<0.5	<0.5	nm
1,2-Dichloroethane (EDC)	mg/kg (ppm)	<0.05	<0.05	nm
1,1,1-Trichloroethane	mg/kg (ppm)	<0.05	<0.05	nm
1,1-Dichloropropene	mg/kg (ppm)	<0.05	<0.05	nm
Carbon Tetrachloride	mg/kg (ppm)	<0.05	<0.05	nm
Benzene	mg/kg (ppm)	<0.03	<0.03	nm
Trichloroethene	mg/kg (ppm)	<0.03	<0.03	nm
1,2-Dichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
Bromodichloromethane	mg/kg (ppm)	<0.05	<0.05	nm
Dibromomethane	mg/kg (ppm)	<0.05	<0.05	nm
4-Methyl-2-pentanone	mg/kg (ppm)	<0.5	<0.5	nm
cis-1,3-Dichloropropene	mg/kg (ppm)	<0.05	<0.05	nm
Toluene	mg/kg (ppm)	<0.05	<0.05	nm
trans-1,3-Dichloropropene	mg/kg (ppm)	<0.05	<0.05	nm
1,1,2-Trichloroethane	mg/kg (ppm)	<0.05	<0.05	nm
2-Hexanone	mg/kg (ppm)	<0.5	<0.5	nm
1,3-Dichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
Tetrachloroethene	mg/kg (ppm)	<0.025	<0.025	nm
Dibromochloromethane	mg/kg (ppm)	<0.05	<0.05	nm
1,2-Dibromoethane (EDB)	mg/kg (ppm)	<0.05	<0.05	nm
Chlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
Ethylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	<0.05	<0.05	nm
m,p-Xylene	mg/kg (ppm)	<0.1	<0.1	nm
o-Xylene	mg/kg (ppm)	<0.05	<0.05	nm
Styrene	mg/kg (ppm)	<0.05	<0.05	nm
Isopropylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
Bromoform	mg/kg (ppm)	<0.05	<0.05	nm
n-Propylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
Bromobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,3,5-Trimethylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	<0.05	<0.05	nm
1,2,3-Trichloropropane	mg/kg (ppm)	<0.05	<0.05	nm
2-Chlorotoluene	mg/kg (ppm)	<0.05	<0.05	nm
4-Chlorotoluene	mg/kg (ppm)	<0.05	<0.05	nm
tert-Butylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,2,4-Trimethylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
sec-Butylbenzene	mg/kg (ppm)	<0.05	<0.05	nm
p-Isopropyltoluene	mg/kg (ppm)	<0.05	<0.05	nm
1,3-Dichlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,4-Dichlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,2-Dichlorobenzene	mg/kg (ppm)	<0.05	<0.05	nm
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	<0.05	<0.05	nm
1,2,4-Trichlorobenzene	mg/kg (ppm)	<0.1	<0.1	nm
Hexachlorobutadiene	mg/kg (ppm)	<0.1	<0.1	nm
Naphthalene	mg/kg (ppm)	<0.05	<0.05	nm
1,2,3-Trichlorobenzene	mg/kg (ppm)	<0.1	<0.1	nm

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Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	89	94	29-163	5
Chloromethane	mg/kg (ppm)	2.5	83	84	28-147	1
Vinyl chloride	mg/kg (ppm)	2.5	92	94	38-143	2
Bromomethane	mg/kg (ppm)	2.5	97	95	32-163	2
Chloroethane	mg/kg (ppm)	2.5	110	117	10-165	6
Trichlorofluoromethane	mg/kg (ppm)	2.5	102	98	22-167	4
Acetone	mg/kg (ppm)	2.5	93	93	20-172	0
1,1-Dichloroethene	mg/kg (ppm)	2.5	95	93	42-140	2
Methylene chloride	mg/kg (ppm)	2.5	90	90	53-137	0
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	94	98	70-122	4
1,1-Dichloroethane	mg/kg (ppm)	2.5	96	97	77-114	1
2,2-Dichloropropane	mg/kg (ppm)	2.5	96	98	65-135	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	95	96	77-120	1
Chloroform	mg/kg (ppm)	2.5	95	97	76-117	2
2-Butanone (MEK)	mg/kg (ppm)	2.5	91	91	52-153	0
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	97	97	76-116	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	96	98	79-120	2
1,1-Dichloropropene	mg/kg (ppm)	2.5	95	96	76-123	1
Carbon Tetrachloride	mg/kg (ppm)	2.5	98	99	75-126	1
Benzene	mg/kg (ppm)	2.5	94	96	76-118	2
Trichloroethene	mg/kg (ppm)	2.5	95	96	75-121	1
1,2-Dichloropropane	mg/kg (ppm)	2.5	96	98	78-123	2
Bromodichloromethane	mg/kg (ppm)	2.5	99	101	79-126	2
Dibromomethane	mg/kg (ppm)	2.5	95	97	79-121	2
4-Methyl-2-pentanone	mg/kg (ppm)	2.5	104	105	52-151	1
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	97	100	80-127	3
Toluene	mg/kg (ppm)	2.5	100	102	76-122	2
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	106	106	80-126	0
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	101	104	77-121	3
2-Hexanone	mg/kg (ppm)	2.5	110	110	67-126	0
1,3-Dichloropropane	mg/kg (ppm)	2.5	101	103	76-122	2
Tetrachloroethene	mg/kg (ppm)	2.5	100	102	77-124	2
Dibromochloromethane	mg/kg (ppm)	2.5	88	91	73-127	3
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	102	104	78-126	2
Chlorobenzene	mg/kg (ppm)	2.5	98	101	79-113	3
Ethylbenzene	mg/kg (ppm)	2.5	100	101	77-120	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	103	105	79-125	2
m,p-Xylene	mg/kg (ppm)	5	102	103	79-121	1
o-Xylene	mg/kg (ppm)	2.5	104	106	80-123	2
Styrene	mg/kg (ppm)	2.5	106	109	81-124	3
Isopropylbenzene	mg/kg (ppm)	2.5	105	105	79-123	0
Bromoform	mg/kg (ppm)	2.5	88	90	65-124	2
n-Propylbenzene	mg/kg (ppm)	2.5	102	105	77-123	3
Bromobenzene	mg/kg (ppm)	2.5	99	103	78-122	4
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	104	106	79-123	2
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	98	101	73-121	3
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	98	102	69-123	4
2-Chlorotoluene	mg/kg (ppm)	2.5	99	103	77-120	4
4-Chlorotoluene	mg/kg (ppm)	2.5	101	104	77-121	3
tert-Butylbenzene	mg/kg (ppm)	2.5	103	105	77-124	2
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	103	106	78-123	3
sec-Butylbenzene	mg/kg (ppm)	2.5	103	103	77-122	0
p-Isopropyltoluene	mg/kg (ppm)	2.5	105	106	79-126	1
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	100	102	78-119	2
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	98	100	77-114	2
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	102	104	78-120	2
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	102	106	66-133	4
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	92	92	71-129	0
Hexachlorobutadiene	mg/kg (ppm)	2.5	100	90	65-134	11
Naphthalene	mg/kg (ppm)	2.5	91	93	51-158	2
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	94	95	37-182	1

Note: The calibration verification result for dibromochloromethane, bromoform, naphthalene and 1,2,3-trichlorobenzene exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the calibration is considered valid.

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 711391-10 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	<0.01	<0.01	nm

Laboratory Code: 711391-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	81	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	78	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	80	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	78	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	82	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	73	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	81	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	81	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	76	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	85	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	87	37-123
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	83	28-134
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	72	55-115
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	77	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	80	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	82	60-105

Date of Report: 12/12/07
Date Received: 11/29/07
Project: SOU_0398-002-03_20071129, F&BI 711391

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	96	98	66-106	2
Acenaphthylene	mg/kg (ppm)	0.17	90	92	63-110	2
Acenaphthene	mg/kg (ppm)	0.17	93	95	65-108	2
Fluorene	mg/kg (ppm)	0.17	95	98	63-112	3
Phenanthrene	mg/kg (ppm)	0.17	95	96	64-107	1
Anthracene	mg/kg (ppm)	0.17	87	89	64-107	2
Fluoranthene	mg/kg (ppm)	0.17	96	96	66-113	0
Pyrene	mg/kg (ppm)	0.17	96	97	66-111	1
Benz(a)anthracene	mg/kg (ppm)	0.17	87	89	55-103	2
Chrysene	mg/kg (ppm)	0.17	97	98	59-109	1
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	97	89	53-107	9
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	99	99	61-112	0
Benzo(a)pyrene	mg/kg (ppm)	0.17	84	86	60-111	2
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	87	90	59-111	3
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	93	95	56-114	2
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	92	94	60-110	2

Note: The initial calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

711391 [redacted]

SAMPLE CHAIN OF CUSTODY

ME 11/29/07 [redacted]

VSI / BI4

Page # 1 of 2

Send Report To Chris Carter cc: E. Rothman & D. Buser

Company SES

Address 2400 Airport Way S. Ste 200

City, State, ZIP Seattle, WA 98134

Phone # 206.306.1900 Fax # 206.306.1907

SAMPLERS (signature)

PROJECT NAME/NO. Wesmar

PO # 6398-002-03

REMARKS Please call Chris Carter or Erin Rothman w/ questions.

GEMS [✓ Y] / N

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	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	Arsenic ~~RCRA-8 Metals~~	PAHs		Notes
B46-05		5'	01	20071127	1005	Soil	1						X	X		
B46-08		8	02	↓	1018	↓	↓						X	X		
B46-10.5		10.5	03		1026											Hold
B46-13		13	04		1040											↓
B46-16		16	05		1048											
B47-05.5		5.5	06		1235								X			
B47-08		8	07		1245											Hold
B47-11.5		11.5	08		1250								X	X		
B47-13		13	09		1320											Hold
B47-16		16	10		1335								X	X		
B48-06		6	11	20071128	0808								X			
B48-08		8	12	↓	0815											Hold
B48-10		10	13		0823											↓

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:		Pete Kingston	SES	11/29/07	1600
Received by:		DD VO	FBI	〃	〃
Relinquished by:					
Received by:			Samples received at 5 °C		

FORMS\COC\SESGEMSR1.DOC (Revision 1)

711391

SAMPLE CHAIN OF CUSTODY

ME 11/29/07

VS1/BI4

Page # 2 of 2

Send Report To See Page One
Company
Address
City, State, ZIP
Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO.

PO #

REMARKS

GEMS Y / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	Arsenic ~~RCRA 8 Metals~~	PAHs		Notes
B48-15		15	14	20071128	0845	Soil	1						X	X		
B48-17.5		17.5	15	↓	0855	↓	1									Hold
B48-20.5		20.5	16		0900		1									↓
B49-05.5		5.5	17	20071129	0923		1						X			
B49-08.5		8.5	18 A-E	↓	0930		5									Hold Label va in lab
B49-10.5		10.5	19 A-E		0944		5	X	X		X		X			NF
B49-15.5		15.5	20	↓	0955	↓	1									Hold

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:		Pete Kingston	SES	11/29/07	1600
Received by:		DO VO	FBI	"	"
Relinquished by:					
Received by:					

Samples received at 5 °C

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #712090

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

December 18, 2007

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on December 10, 2007 from the SOU_0398-002-01_20071210, F&BI 712090 project. There are 73 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Erin Rothman, David Buser, Brandi Reyna, Pete Kingston
SOU1218R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 10, 2007 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-01_20071210, F&BI 712090 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
712090-01	MW01-20071206
712090-02	MW02-20071206
712090-03	MW03-20071206
712090-04	MW04-20071207
712090-05	MW05-20071206
712090-06	MW06-20071206
712090-07	MW07-20071206
712090-08	MW08-20071206
712090-09	MW09-20071207
712090-10	MW10-20071206
712090-11	MW11-20071206
712090-12	MW12-20071207
712090-13	MW13-20071207
712090-14	MW14-20071207
712090-15	MW15-20071207
712090-16	MW16-20071207
712090-17	MW17-20071207
712090-18	MW99-20071206
712090-19	Trip Blank

The 8260B sample MW11-20071206 was not received in a container approved by the method. The data is flagged accordingly. All other quality control requirements were acceptable.

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090
Date Extracted: 12/11/07
Date Analyzed: 12/11/07

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
Trip Blank 712090-19	<100	93
Method Blank	<100	96

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090
Date Extracted: 12/11/07
Date Analyzed: 12/11/07

RESULTS FROM THE ANALYSIS OF THE WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-132)
MW12-20071207 712090-12	73	<250	93
MW13-20071207 712090-13	<50	<250	81
MW14-20071207 712090-14	<50	<250	90
MW15-20071207 712090-15	<50	<250	87
MW16-20071207 712090-16	240	<250	79
MW17-20071207 712090-17	530	310 y	85
Method Blank	<50	<250	76

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW01-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-01
Date Analyzed:	12/13/07	Data File:	712090-01.056
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	16.7

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW02-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-02
Date Analyzed:	12/13/07	Data File:	712090-02.057
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	71	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.35

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW03-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-03
Date Analyzed:	12/13/07	Data File:	712090-03.058
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	67	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	502

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW04-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-04
Date Analyzed:	12/13/07	Data File:	712090-04.059
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	71	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	151

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW05-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-05
Date Analyzed:	12/13/07	Data File:	712090-05.060
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	67	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	130

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW06-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-06
Date Analyzed:	12/13/07	Data File:	712090-06.061
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	68	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	4.10

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW07-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-07
Date Analyzed:	12/13/07	Data File:	712090-07.063
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	70	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	613

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW08-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-08
Date Analyzed:	12/13/07	Data File:	712090-08.064
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	70	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	6.35

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW09-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-09
Date Analyzed:	12/13/07	Data File:	712090-09.065
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	68	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW10-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-10
Date Analyzed:	12/13/07	Data File:	712090-10.066
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	71	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW11-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-11
Date Analyzed:	12/13/07	Data File:	712090-11.069
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	67	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	33.7

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW12-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-12
Date Analyzed:	12/13/07	Data File:	712090-12.070
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	67	60	125
Bismuth	80	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	2.34
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW13-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-13
Date Analyzed:	12/13/07	Data File:	712090-13.071
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	66	60	125
Bismuth	83	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	25.1
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW14-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-14
Date Analyzed:	12/13/07	Data File:	712090-14.072
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	66	60	125
Bismuth	79	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.64
Lead	1.60

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW15-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-15
Date Analyzed:	12/13/07	Data File:	712090-15.074
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	61	60	125
Bismuth	76	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	7.36
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW16-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-16
Date Analyzed:	12/13/07	Data File:	712090-16.075
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	60	60	125
Bismuth	69	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	6.91
Lead	2.90

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW17-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-17
Date Analyzed:	12/13/07	Data File:	712090-17.076
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	61	60	125
Bismuth	74	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.60
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	MW99-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-18
Date Analyzed:	12/13/07	Data File:	712090-18.077
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	61	60	125
Bismuth	75	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	627
Lead	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	I7-466 mb
Date Analyzed:	12/13/07	Data File:	I7-466 mb.054
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	73	60	125
Bismuth	94	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW01-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-01
Date Analyzed:	12/13/07	Data File:	712090-01.032
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	83	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	16.5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW02-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-02
Date Analyzed:	12/13/07	Data File:	712090-02.033
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.03

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW03-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-03
Date Analyzed:	12/13/07	Data File:	712090-03.034
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	456

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW04-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-04
Date Analyzed:	12/13/07	Data File:	712090-04.035
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	78	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	145

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW05-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-05
Date Analyzed:	12/13/07	Data File:	712090-05.036
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	76	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	113

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW06-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-06
Date Analyzed:	12/13/07	Data File:	712090-06.037
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	76	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	3.96

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW07-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-07
Date Analyzed:	12/13/07	Data File:	712090-07.038
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	78	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	596

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW08-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-08
Date Analyzed:	12/13/07	Data File:	712090-08.039
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	77	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	6.12

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW09-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-09
Date Analyzed:	12/13/07	Data File:	712090-09.041
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	78	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW10-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-10
Date Analyzed:	12/13/07	Data File:	712090-10.042
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW11-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-11
Date Analyzed:	12/13/07	Data File:	712090-11.045
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	35.6

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW12-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-12
Date Analyzed:	12/13/07	Data File:	712090-12.046
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	86	60	125
Bismuth	89	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.97
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW13-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-13
Date Analyzed:	12/13/07	Data File:	712090-13.047
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	83	60	125
Bismuth	96	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	25.7
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW14-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-14
Date Analyzed:	12/13/07	Data File:	712090-14.048
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	81	60	125
Bismuth	89	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.46
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW15-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-15
Date Analyzed:	12/13/07	Data File:	712090-15.049
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	80	60	125
Bismuth	88	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	7.42
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW16-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-16
Date Analyzed:	12/13/07	Data File:	712090-16.050
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	78	60	125
Bismuth	80	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	6.64
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW17-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-17
Date Analyzed:	12/13/07	Data File:	712090-17.052
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	74	60	125
Bismuth	80	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	1.51
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	MW99-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	712090-18
Date Analyzed:	12/13/07	Data File:	712090-18.053
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	72	60	125
Bismuth	83	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	629
Lead	<1

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/12/07	Lab ID:	I7-467 mb
Date Analyzed:	12/13/07	Data File:	I7-467 mb.030
Matrix:	Water	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	HR

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Indium	79	60	125
Bismuth	92	60	125

Analyte:	Concentration ug/L (ppb)
Arsenic	<1
Lead	<1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	MW12-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-12
Date Analyzed:	12/12/07	Data File:	121208.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	87	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	MW13-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-13
Date Analyzed:	12/12/07	Data File:	121209.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	50	150
Benzo(a)anthracene-d12	88	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	MW14-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-14
Date Analyzed:	12/12/07	Data File:	121210.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	96	50	150
Benzo(a)anthracene-d12	87	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	MW15-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-15
Date Analyzed:	12/12/07	Data File:	121211.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	50	150
Benzo(a)anthracene-d12	87	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	MW16-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-16
Date Analyzed:	12/12/07	Data File:	121212.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	88	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	0.17
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	MW17-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-17
Date Analyzed:	12/12/07	Data File:	121213.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	93	50	150
Benzo(a)anthracene-d12	85	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	0.12
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	071986mb2
Date Analyzed:	12/12/07	Data File:	121207.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	50	150
Benzo(a)anthracene-d12	88	50	150

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	<0.1
Anthracene	<0.1
Fluoranthene	<0.1
Pyrene	<0.1
Benz(a)anthracene	<0.1
Chrysene	<0.1
Benzo(a)pyrene	<0.1
Benzo(b)fluoranthene	<0.1
Benzo(k)fluoranthene	<0.1
Indeno(1,2,3-cd)pyrene	<0.1
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	<0.1

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW08-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-08
Date Analyzed:	12/11/07	Data File:	121110.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	87	55	118
1,2-Dichloroethane-d4	78	53	121
Toluene-d8	80	55	121
4-Bromofluorobenzene	77	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW11-20071206	Client:	Sound Environmental Strategies
Date Received:	12/13/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/13/07	Lab ID:	712090-11
Date Analyzed:	12/13/07	Data File:	121307.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	86	55	118
1,2-Dichloroethane-d4	79	53	121
Toluene-d8	79	55	121
4-Bromofluorobenzene	80	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The sample was received in a container not approved by the method. The value reported should be considered an estimate.

Note: The sample was received with incorrect preservation.

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW13-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-13
Date Analyzed:	12/11/07	Data File:	121115.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	87	55	118
1,2-Dichloroethane-d4	79	53	121
Toluene-d8	79	55	121
4-Bromofluorobenzene	79	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1
Naphthalene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW14-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-14
Date Analyzed:	12/11/07	Data File:	121111.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	85	55	118
1,2-Dichloroethane-d4	79	53	121
Toluene-d8	79	55	121
4-Bromofluorobenzene	77	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW15-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-15
Date Analyzed:	12/11/07	Data File:	121112.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	87	55	118
1,2-Dichloroethane-d4	80	53	121
Toluene-d8	80	55	121
4-Bromofluorobenzene	77	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1
Naphthalene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW16-20071207	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-16
Date Analyzed:	12/11/07	Data File:	121113.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	86	55	118
1,2-Dichloroethane-d4	77	53	121
Toluene-d8	80	55	121
4-Bromofluorobenzene	78	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Trip Blank	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-19
Date Analyzed:	12/11/07	Data File:	121114.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	85	55	118
1,2-Dichloroethane-d4	77	53	121
Toluene-d8	79	55	121
4-Bromofluorobenzene	77	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	071872 mb
Date Analyzed:	12/11/07	Data File:	121106.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	84	55	118
1,2-Dichloroethane-d4	78	53	121
Toluene-d8	76	55	121
4-Bromofluorobenzene	91	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/13/07	Lab ID:	072005 mb
Date Analyzed:	12/13/07	Data File:	121306.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	85	55	118
1,2-Dichloroethane-d4	78	53	121
Toluene-d8	75	55	121
4-Bromofluorobenzene	85	29	181

Compounds:	Concentration ug/L (ppb)
Benzene	<1
Toluene	<1
Ethylbenzene	<1
m,p-Xylene	<2
o-Xylene	<1
Vinyl chloride	<0.2
Chloroethane	<1
1,1-Dichloroethene	<1
Methylene chloride	<5
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
cis-1,2-Dichloroethene	<1
1,2-Dichloroethane (EDC)	<1
1,1,1-Trichloroethane	<1
Trichloroethene	<1
Tetrachloroethene	<1

Note: The reporting limit for vinyl chloride is equal to the MDL.

Analysis For Semivolatile Compounds By EPA Method 8270C

Client Sample ID:	MW07-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-07
Date Analyzed:	12/11/07	Data File:	121108.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	54	23	77
Phenol-d6	41	10	63
2,4,6-Tribromophenol	74	40	105

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<10

Analysis For Semivolatile Compounds By EPA Method 8270C

Client Sample ID:	MW99-20071206	Client:	Sound Environmental Strategies
Date Received:	12/10/07	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	712090-18
Date Analyzed:	12/11/07	Data File:	121109.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	55	23	77
Phenol-d6	42	10	63
2,4,6-Tribromophenol	76	40	105

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<10

Analysis For Semivolatile Compounds By EPA Method 8270C

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-01_20071210
Date Extracted:	12/11/07	Lab ID:	071994mb
Date Analyzed:	12/11/07	Data File:	121107.D
Matrix:	Water	Instrument:	GCMS3
Units:	ug/L (ppb)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	54	23	77
Phenol-d6	41	10	63
2,4,6-Tribromophenol	76	40	105

Compounds:	Concentration ug/L (ppb)
Pentachlorophenol	<10

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090
Date Extracted: 12/11/07
Date Analyzed: 12/13/07

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR PCBs AS AROCLORS USING EPA METHOD 8082

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Aroclor 1221	1232	1016	1242	1248	1254	1260	1262	Surrogate (% Rec.) (Limit 50-150)
MW04-20071207 712090-04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	66
MW07-20071206 712090-07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	58
MW99-20071206 712090-18	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	59
Method Blank	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	54

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 712076-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	86	69-134

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	95	103	67-141	8

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 712090-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	102	110	50-150	8
Lead	ug/L (ppb)	10	<1	101	108	50-150	7

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	83	70-130
Lead	ug/L (ppb)	10	106	70-130

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 712090-10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<1	101	105	50-150	4
Lead	ug/L (ppb)	10	<1	104	104	50-150	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	83	70-130
Lead	ug/L (ppb)	10	100	70-130

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	5	83	82	70-130	1
Acenaphthylene	ug/L (ppb)	5	85	83	70-130	2
Acenaphthene	ug/L (ppb)	5	84	84	70-130	0
Fluorene	ug/L (ppb)	5	83	83	70-130	0
Phenanthrene	ug/L (ppb)	5	82	82	70-130	0
Anthracene	ug/L (ppb)	5	84	82	70-130	2
Fluoranthene	ug/L (ppb)	5	83	80	70-130	4
Pyrene	ug/L (ppb)	5	82	80	70-130	2
Benz(a)anthracene	ug/L (ppb)	5	82	80	70-130	2
Chrysene	ug/L (ppb)	5	85	81	70-130	5
Benzo(b)fluoranthene	ug/L (ppb)	5	97	97	70-130	0
Benzo(k)fluoranthene	ug/L (ppb)	5	87	88	70-130	1
Benzo(a)pyrene	ug/L (ppb)	5	85	85	70-130	0
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	5	86	88	70-130	2
Dibenz(a,h)anthracene	ug/L (ppb)	5	85	86	70-130	1
Benzo(g,h,i)perylene	ug/L (ppb)	5	85	85	70-130	0

Note: The initial calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 712090-08 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	ug/L (ppb)	<0.2	<0.2	nm
Chloroethane	ug/L (ppb)	<1	<1	nm
1,1-Dichloroethene	ug/L (ppb)	<1	<1	nm
Methylene chloride	ug/L (ppb)	<5	<5	nm
trans-1,2-Dichloroethene	ug/L (ppb)	<1	<1	nm
1,1-Dichloroethane	ug/L (ppb)	<1	<1	nm
cis-1,2-Dichloroethene	ug/L (ppb)	<1	<1	nm
1,2-Dichloroethane (EDC)	ug/L (ppb)	<1	<1	nm
1,1,1-Trichloroethane	ug/L (ppb)	<1	<1	nm
Benzene	ug/L (ppb)	<1	<1	nm
Trichloroethene	ug/L (ppb)	<1	<1	nm
Toluene	ug/L (ppb)	<1	<1	nm
Tetrachloroethene	ug/L (ppb)	<1	<1	nm
Ethylbenzene	ug/L (ppb)	<1	<1	nm
m,p-Xylene	ug/L (ppb)	<2	<2	nm
o-Xylene	ug/L (ppb)	<1	<1	nm

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	93	56-144
Chloroethane	ug/L (ppb)	50	85	55-144
1,1-Dichloroethene	ug/L (ppb)	50	80	34-135
Methylene chloride	ug/L (ppb)	50	75	65-112
trans-1,2-Dichloroethene	ug/L (ppb)	50	89	66-120
1,1-Dichloroethane	ug/L (ppb)	50	94	65-119
cis-1,2-Dichloroethene	ug/L (ppb)	50	94	75-121
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	92	67-116
1,1,1-Trichloroethane	ug/L (ppb)	50	85	63-124
Benzene	ug/L (ppb)	50	92	55-134
Trichloroethene	ug/L (ppb)	50	94	75-116
Toluene	ug/L (ppb)	50	104	56-140
Tetrachloroethene	ug/L (ppb)	50	108	78-116
Ethylbenzene	ug/L (ppb)	50	96	76-123
m,p-Xylene	ug/L (ppb)	100	96	49-166
o-Xylene	ug/L (ppb)	50	92	68-121

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 712134-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	<0.2	129	129	50-150	0
Chloroethane	ug/L (ppb)	50	<1	127	129	50-150	2
1,1-Dichloroethene	ug/L (ppb)	50	<1	99	97	50-150	2
Methylene chloride	ug/L (ppb)	50	<5	101	103	50-150	2
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	98	50-150	3
1,1-Dichloroethane	ug/L (ppb)	50	<1	98	96	50-150	2
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	101	98	50-150	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	96	94	50-150	2
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	96	94	50-150	2
Benzene	ug/L (ppb)	50	<1	98	96	50-150	2
Trichloroethene	ug/L (ppb)	50	<1	97	95	50-150	2
Toluene	ug/L (ppb)	50	<1	95	95	50-150	0
Tetrachloroethene	ug/L (ppb)	50	<1	98	97	50-150	1
Ethylbenzene	ug/L (ppb)	50	<1	95	94	50-150	1
m,p-Xylene	ug/L (ppb)	100	<2	94	94	50-150	0
o-Xylene	ug/L (ppb)	50	<1	96	95	50-150	1

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Vinyl chloride	ug/L (ppb)	50	106	56-144
Chloroethane	ug/L (ppb)	50	103	55-144
1,1-Dichloroethene	ug/L (ppb)	50	79	34-135
Methylene chloride	ug/L (ppb)	50	84	65-112
trans-1,2-Dichloroethene	ug/L (ppb)	50	85	66-120
1,1-Dichloroethane	ug/L (ppb)	50	90	65-119
cis-1,2-Dichloroethene	ug/L (ppb)	50	90	75-121
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	91	67-116
1,1,1-Trichloroethane	ug/L (ppb)	50	82	63-124
Benzene	ug/L (ppb)	50	90	55-134
Trichloroethene	ug/L (ppb)	50	88	75-116
Toluene	ug/L (ppb)	50	95	56-140
Tetrachloroethene	ug/L (ppb)	50	93	78-116
Ethylbenzene	ug/L (ppb)	50	92	76-123
m,p-Xylene	ug/L (ppb)	100	91	49-166
o-Xylene	ug/L (ppb)	50	90	68-121

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Pentachlorophenol	ug/L (ppb)	75	43	42	16-122	2

Date of Report: 12/18/07
Date Received: 12/10/07
Project: SOU_0398-002-01_20071210, F&BI 712090

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	% Recovery LCS	% Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	2.5	74	64	52-135	14
Aroclor 1260	ug/L (ppb)	2.5	76	68	60-128	11

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

fp – Compounds in the sample matrix interfered with quantitation of the analyte. The reported concentration may be a false positive.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

712090

SAMPLE CHAIN OF CUSTODY

ME-12-10-07 C05/B24/V2

Send Report To Chris Carter / Erin Rothman
Company Sound Environmental Strategies
Address 2400 Airport Way South, Suite 200
City, State, ZIP Seattle, WA 98134
Phone # 206.306.1900 Fax # 206.306.1907

SAMPLERS (*signature*) L. Namba, B. Dixon, S. Reilly

PROJECT NAME/NO. BB2 - Wesmar 0398-002-01

PO #

REMARKS Dissolves samples were field filtered. As and Pb metal samples unpreserved.

GEMS Y / N

Page # 1 of 2

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH Results by Fri (12/14/07)
Rush charges authorized by: Chris Charter

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	NWTPH-Dx /ORPH	NWTPH-Gx	BTEX by 8021B	CVOCs	PAHs	PCBs	PCP	Total Pb	Dissolved Pb	Total As	Dissolved As	Notes
mw01-20071206	mw-01	–	01 A-B	12/06/07	1411	Water	2										✓	✓	Cancel ✓-per CC
mw02-20071206	mw-02	–	02 A-B	12/06/07	1323	Water	2										✓	✓	12/11/07 mc
mw03-20071206	mw-03	–	03 A-B	12/06/07	1505	Water	2										✓	✓	
mw04-20071207	mw-04	–	04 A-D	12/07/07	1626	water	4						✓	✓			✓	✓	500 mL AGB for PCP/P
mw05-20071206	mw-05	–	05 A-B	12/06/07	1455	water	2										✓	✓	
mw06-20071206	mw-06	–	06 A-B	12/06/07	1233	water	2										✓	✓	
mw07-20071206	mw-07	–	07 A-D	12/06/07	1300	water	4						✓	✓			✓	✓	
mw08-20071206	mw-08	–	08 A-E	12/06/07	1602	water	5			✓	✓						✓	✓	
mw09-20071207	mw-09	–	[illegible] A-B	12/07/07	1545	water	2										✓	✓	
mw10-20071206	mw-10	–	10 A-F	12/06/07	1403	water	6										✓	✓	MS/MSD
mw11-20071206	mw-11	–	11 A-D	12/06/07	1213	water	4			✓	✓						✓	✓	
mw12-20071207	mw-12	–	12 A-D	12/07/07	1258	water	4	✓				✓			✓	✓	✓	✓	
mw13-20071207	mw-13	–	13 A-G	12/07/07	1152	water	7	✓		✓	✓	✓			✓	✓	✓	✓	

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:		Larry Namba	SES	12/10/07	
Received by:		DO VO	FBI	〃	11:25
Relinquished by:					
Received by:					

Samples received at 0 °C

FORMS\COC\SESGEMSR1.DOC (Revision 1)

712090

SAMPLE CHAIN OF COUSTODY ME 12-10-07

C05/BI4/V2

Page # 1 of 1

Send Report To Chris Carter / Erin Rothman

Company Sound Environmental Strategies

Address 2400 Airport Way South, Suite 200

City, State, ZIP Seattle, WA 98134

Phone # 206.306.1900 Fax # 206.306.1907

SAMPLERS (signature) L. Namba, B. Dixon, S. Reilly

PROJECT NAME/NO. BB2 - Wesmar 0398-002-01

PO #

REMARKS Dissolves samples were field filtered. AS and Pb metal samples unpreserved.

GEMS Y / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH Results by Fri (12/14/07)
Rush charges authorized by: chris Charter

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED											
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx/ORPH	NWTPH-Gx	BTEX by 8021B	CVOCs	PAHs	PCBs	PCP	Total Pb	Dissolved Pb	Total AS	Dissolved AS	Notes
mw14-20071207	mw-14	–	14A-G	12/07/07	1357	Water	7	✓		✓	✓	✓			✓	✓	✓	✓	
mw15-20071207	mw-15	–	15A-G	12/07/07	1214	water	7	✓		✓	✓	✓			✓	✓	✓	✓	
mw16-20071207	mw-16	–	16A-G	12/07/07	1329	water	7	✓		✓	✓	✓			✓	✓	✓	✓	
mw17-20071207	mw-17	–	17A-D	12/07/07	1500	water	4	✓				✓			✓	✓	✓	✓	
mw99-20071206	mw-99	–	18A-D	12/06/07	1315	water	4						✓	✓	✓	✓	✓	✓	
Trip Blank	TB	–	19A-B	12/06/07	0800	Water	2		✓	✓	✓								

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:	Larry Namba	SES	12/10/07	
Received by:	DO VO	FBI	"	11-25 A
Relinquished by:				
Received by:				

Samples received at 0 °C

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #804240

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

April 30, 2008

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on April 23, 2008 from the SOU_0398-002-01_20080423, F&BI 804240 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
SOU0430R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 23, 2008 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-01_20080423, F&BI 804240 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
804240-01	B51-1'
804240-02	B52-1'

All quality control requirements were acceptable.

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B51-1'	Client:	Sound Environmental Strategies
Date Received:	04/23/08	Project:	SOU_0398-002-01_20080423
Date Extracted:	04/24/08	Lab ID:	804240-01 1/5
Date Analyzed:	04/24/08	Data File:	042405.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	87	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B52-1'	Client:	Sound Environmental Strategies
Date Received:	04/23/08	Project:	SOU_0398-002-01_20080423
Date Extracted:	04/24/08	Lab ID:	804240-02 1/5
Date Analyzed:	04/24/08	Data File:	042406.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	78	50	150
Benzo(a)anthracene-d12	79	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-01_20080423
Date Extracted:	04/24/08	Lab ID:	08-627mb2 1/5
Date Analyzed:	04/24/08	Data File:	042404.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	86	50	150
Benzo(a)anthracene-d12	86	35	159

Compounds:	Concentration mg/kg (ppm)
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01

Date of Report: 04/30/08
Date Received: 04/23/08
Project: SOU_0398-002-01_20080423, F&BI 804240

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 804211-22 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Benz(a)anthracene	mg/kg (ppm)	<0.1	<0.1	nm
Chrysene	mg/kg (ppm)	0.22	0.22	0
Benzo(b)fluoranthene	mg/kg (ppm)	<0.1	<0.1	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.1	<0.1	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.1	<0.1	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.1	<0.1	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.1	<0.1	nm

Laboratory Code: 804240-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	80	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	85	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	86	28-134
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	81	55-115
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	81	37-123
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	88	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	90	69-100

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Benz(a)anthracene	mg/kg (ppm)	0.17	87	82	58-108	6
Chrysene	mg/kg (ppm)	0.17	93	88	64-115	6
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	99	92	54-119	7
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	95	88	61-123	8
Benzo(a)pyrene	mg/kg (ppm)	0.17	87	81	54-111	7
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	95	91	46-126	4
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	90	88	57-119	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

804240

SAMPLE CHAIN OF CUSTODY

ME 4/23/08 D01

Page # ______ of ______

Send Report To Chris Carter

Company SES

Address 2900 Airport way Suite 200

City, State, ZIP Seattle WA 98116

Phone # 206-306-1900 Fax # x -1907

SAMPLERS (signature)

PROJECT NAME/NO. Wesmar

PO # 0338-002-01

REMARKS Rush

GEMS Y / N

TURNAROUND TIME
☐ Standard (2 Weeks)
☐ RUSH ______
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	PAH Short list		Notes
~~BR-11~~ BS1-1'		1'	01	4-23-08		Soil	1							X		
~~BR-12~~ BS2-1'		1'	02	4-23-08		Soil	1							X		
rec 4/24/08 MG																

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:	Chris Carter	SES	4-23-08	16:45
Received by:	HONG NGUYEN	FBI	2	2
Relinquished by:				
Received by:				

FORMS\COC\SESGEMSR1.DOC (Revision 1)

received at 18 °C

Friedman & Bruya, Inc. #806080

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

June 17, 2008

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on June 6, 2008 from the SOU_0398-002-03_20080606, F&BI 806080 project. There are 24 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Erin Rothman
SOU0617R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 6, 2008 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20080606, F&BI 806080 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
806080-01	B53-11.5
806080-02	B53-16
806080-03	B54-11.5
806080-04	B54-16
806080-05	B55-11.5
806080-06	B55-16
806080-07	B56-09
806080-08	B56-16
806080-09	B57-09
806080-10	B57-16
806080-11	B58-09
806080-12	B58-16
806080-13	B59-09
806080-14	B59-16

All quality control requirements were acceptable.

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080
Date Extracted: 06/11/08 and 06/12/08
Date Analyzed: 06/11/08 and 06/12/08

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 50-150)
B53-11.5 806080-01	<50	<250	95
B53-16 806080-02	<50	<250	94
B54-11.5 806080-03	<50	<250	96
B54-16 806080-04	<50	<250	95
B55-11.5 806080-05	1,400	2,800	92
B55-16 806080-06	<50	<250	97
B56-09 806080-07	<50	<250	94
B56-16 806080-08	<50	<250	94
B57-09 806080-09	<50	<250	95
B57-16 806080-10	<50	<250	95
Method Blank	<50	<250	94
Method Blank	<50	<250	94

Analysis For Total Metals By EPA Method 200.8

Client ID:	B55-11.5	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/13/08	Lab ID:	806080-05
Date Analyzed:	06/13/08	Data File:	806080-05.029
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	118	60	125
Indium	93	60	125
Holmium	101	60	125

Analyte:	Concentration mg/kg (ppm)
Cadmium	<1

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/13/08	Lab ID:	I8-221 mb
Date Analyzed:	06/13/08	Data File:	I8-221 mb.015
Matrix:	Soil	Instrument:	ICPMS1
Units:	mg/kg (ppm)	Operator:	hr

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	98	60	125
Indium	98	60	125
Holmium	102	60	125

Analyte:	Concentration mg/kg (ppm)
Cadmium	<1

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B53-11.5	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-01 1/5
Date Analyzed:	06/10/08	Data File:	061009.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	92	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.037
Anthracene	0.011
Fluoranthene	0.056
Pyrene	0.061
Benz(a)anthracene	0.027
Chrysene	0.028
Benzo(a)pyrene	0.031
Benzo(b)fluoranthene	0.032
Benzo(k)fluoranthene	0.011
Indeno(1,2,3-cd)pyrene	0.021
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.020

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B53-16	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-02 1/5
Date Analyzed:	06/06/08	Data File:	060611.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	50	150
Benzo(a)anthracene-d12	96	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B54-11.5	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-03 1/5
Date Analyzed:	06/10/08	Data File:	061012.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	112	50	150
Benzo(a)anthracene-d12	105	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.096
Acenaphthylene	0.044
Acenaphthene	0.060
Fluorene	0.083
Phenanthrene	0.52
Anthracene	0.16
Fluoranthene	0.73
Pyrene	0.79
Benz(a)anthracene	0.40
Chrysene	0.44
Benzo(a)pyrene	0.51
Benzo(b)fluoranthene	0.52
Benzo(k)fluoranthene	0.16
Indeno(1,2,3-cd)pyrene	0.33
Dibenz(a,h)anthracene	0.060
Benzo(g,h,i)perylene	0.29

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B54-16	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-04 1/5
Date Analyzed:	06/06/08	Data File:	060613.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	111	50	150
Benzo(a)anthracene-d12	99	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B55-11.5	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/10/08	Lab ID:	806080-05 1/250
Date Analyzed:	06/10/08	Data File:	061008.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	640 ds	50	150
Benzo(a)anthracene-d12	244 ds	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	7.4
Acenaphthylene	21
Acenaphthene	15
Fluorene	24
Phenanthrene	140
Anthracene	40
Fluoranthene	160
Pyrene	170
Benz(a)anthracene	82
Chrysene	92
Benzo(a)pyrene	110
Benzo(b)fluoranthene	110
Benzo(k)fluoranthene	42
Indeno(1,2,3-cd)pyrene	73
Dibenz(a,h)anthracene	13
Benzo(g,h,i)perylene	64

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B55-16	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/10/08	Lab ID:	806080-06 1/5
Date Analyzed:	06/10/08	Data File:	061007.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	50	150
Benzo(a)anthracene-d12	90	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B56-09	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-07 1/5
Date Analyzed:	06/10/08	Data File:	061010.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	111	50	150
Benzo(a)anthracene-d12	97	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.011
Anthracene	<0.01
Fluoranthene	0.027
Pyrene	0.034
Benz(a)anthracene	0.014
Chrysene	0.015
Benzo(a)pyrene	0.015
Benzo(b)fluoranthene	0.015
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.011
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.011

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B56-16	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-08 1/5
Date Analyzed:	06/06/08	Data File:	060615.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	112	50	150
Benzo(a)anthracene-d12	96	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B57-09	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-09 1/5
Date Analyzed:	06/10/08	Data File:	061011.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	112	50	150
Benzo(a)anthracene-d12	98	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.027
Anthracene	<0.01
Fluoranthene	0.037
Pyrene	0.046
Benz(a)anthracene	0.022
Chrysene	0.025
Benzo(a)pyrene	0.030
Benzo(b)fluoranthene	0.027
Benzo(k)fluoranthene	0.012
Indeno(1,2,3-cd)pyrene	0.022
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.021

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B57-16	Client:	Sound Environmental Strategies
Date Received:	06/06/08	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	806080-10 1/5
Date Analyzed:	06/06/08	Data File:	060617.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	108	50	150
Benzo(a)anthracene-d12	93	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/10/08	Lab ID:	080904mb 1/5
Date Analyzed:	06/10/08	Data File:	061006.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	102	50	150
Benzo(a)anthracene-d12	89	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-03_20080606
Date Extracted:	06/06/08	Lab ID:	080892mb 1/5
Date Analyzed:	06/06/08	Data File:	060606.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	110	50	150
Benzo(a)anthracene-d12	100	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 806112-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	123	111	50-150	10

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	125	70-130

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 806080-09 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	107	107	69-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	109	70-127

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 806139-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Cadmium	mg/kg (ppm)	<1	<1	nm	0-20

Laboratory Code: 806139-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Cadmium	mg/kg (ppm)	10	<1	98	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Cadmium	mg/kg (ppm)	10	99	70-130

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 806080-06 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	<0.01	<0.01	nm

Laboratory Code: 806080-06 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	85	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	85	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	84	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	84	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	82	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	81	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	83	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	83	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	81	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	84	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	82	28-134
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	84	55-115
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	78	37-123
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	83	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	82	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	81	60-105

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	84	91	72-112	8
Acenaphthylene	mg/kg (ppm)	0.17	79	86	68-112	8
Acenaphthene	mg/kg (ppm)	0.17	84	90	70-111	7
Fluorene	mg/kg (ppm)	0.17	84	90	69-110	7
Phenanthrene	mg/kg (ppm)	0.17	83	89	68-111	7
Anthracene	mg/kg (ppm)	0.17	79	85	67-110	7
Fluoranthene	mg/kg (ppm)	0.17	84	91	68-114	8
Pyrene	mg/kg (ppm)	0.17	84	91	68-114	8
Benz(a)anthracene	mg/kg (ppm)	0.17	78	81	58-108	4
Chrysene	mg/kg (ppm)	0.17	84	91	64-115	8
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	80	84	54-119	5
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	83	91	61-123	9
Benzo(a)pyrene	mg/kg (ppm)	0.17	74	78	54-111	5
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	83	87	46-126	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	83	89	57-119	7
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	82	89	60-116	8

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: : 806072-03 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	<0.01	<0.01	nm

Laboratory Code: 806072-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	83	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	78	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	81	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	85	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	83	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	77	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	91	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	90	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	78	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	84	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	84	28-134
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	87	55-115
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	79	37-123
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	80	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	83	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	82	60-105

Date of Report: 06/17/08
Date Received: 06/06/08
Project: SOU_0398-002-03_20080606, F&BI 806080

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	92	93	72-112	1
Acenaphthylene	mg/kg (ppm)	0.17	88	89	68-112	1
Acenaphthene	mg/kg (ppm)	0.17	91	91	70-111	0
Fluorene	mg/kg (ppm)	0.17	90	93	69-110	3
Phenanthrene	mg/kg (ppm)	0.17	89	91	68-111	2
Anthracene	mg/kg (ppm)	0.17	80	83	67-110	4
Fluoranthene	mg/kg (ppm)	0.17	91	93	68-114	2
Pyrene	mg/kg (ppm)	0.17	90	93	68-114	3
Benz(a)anthracene	mg/kg (ppm)	0.17	84	87	58-108	4
Chrysene	mg/kg (ppm)	0.17	90	92	64-115	2
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	91	89	54-119	2
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	86	92	61-123	7
Benzo(a)pyrene	mg/kg (ppm)	0.17	78	81	54-111	4
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	89	91	46-126	2
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	89	92	57-119	3
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	88	90	60-116	2

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

806080

SAMPLE CHAIN OF CUSTODY

ME 06/06/08

C03

Send Report To Chris Carter

Company SES

Address 2400 Airport way S. Suite 200

City, State, ZIP Seattle WA 98134

Phone # 206 306 1900 Fax # 206 306 1907

SAMPLERS *(signature)*	
PROJECT NAME/NO. 0398-002-03	**PO #**
REMARKS	**GEMS Y / N**

Page # ________ of ________

TURNAROUND TIME

☐ Standard (2 Weeks)

☒ RUSH 24hr TAT

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

									ANALYSES REQUESTED								
Lab ID	Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	& Cd RCRA-~~8~~ Metals	PAH's short list		Notes ⊗ - per c 6/9/08 MC
01	B53-11.5	B53	11.5	0825	6.6.08		Soil	1	✓						X		24hr TAT
02	B53-16	B53	16	0840					✓						X		~~Hold~~
03	B54-11.5	B54	11.5	0920					✓						X		24hr TAT
04	B54-16	B54	16	0930					✓						X		~~Hold~~ 24hr
05	B55-11.5	B55	11.5	1000					⊗					✓	⊗		Hold
06	B55-16	B55	16	1005					✓						⊗		Hold
07	B56-09	B56	09	1040					✓						X		24hr TAT
08	B56-16	B56	16	1045					✓						X		~~Hold~~ 24hr
09	B57-09	B57	09	1100					✓						X		24hr TAT
10	B58-16	B57	16	1105					✓						X		~~Hold~~ 24hr
11	B58-09	B58	09	1135													Hold
12	B58-16	B58	16	1140													Hold
13	B59-09	B59	09	1155													Hold

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:	Robert A. Hornberger	SES	6-6-08	1256
Received by:	Michael E. Gahl	F&B	L	L
Relinquished by:				
Received by:				

Samples received at 9 °C

FORMS\COC\SESGEMSR1.DOC (Revision 1)

806080

SAMPLE CHAIN OF CUSTODY

ME 06/06/08

C03

Send Report To Chris Carter

Company SES

Address 2400 Airport Way S. Suite 200

City, State, ZIP Seattle WA 98134

Phone # 206 306 1900 **Fax #** 206 306 1900

SAMPLERS *(signature)*

PROJECT NAME/NO. 0398-002-03

PO #

REMARKS

GEMS Y / N

Page # 2 **of** 2

TURNAROUND TIME

☐ Standard (2 Weeks)

☒ RUSH

Rush charges authorized by:

SAMPLE DISPOSAL

☒ Dispose after 30 days

☐ Return samples

☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals			Notes
B59-16	B59	16	14	6-6-08	1200	Soil	1									Hold

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:	Robert A. Hunsberger	SES	6-6-08	1250
Received by:	Michael Erdahl	FEB	L	L
Relinquished by:				
Received by:		Samples received at 9 °C		

FORMS\COC\SESGEMSR1.DOC (Revision 1)

Friedman & Bruya, Inc. #806194

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

June 23, 2008

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on June 17, 2008 from the SOU_0398-002-03_20080617, F&BI 806194 project. There are 6 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Erin Rothman
SOU0623R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on June 17, 2008 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20080617, F&BI 806194 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
806194-01	B60-11.5
806194-02	B60-16

All quality control requirements were acceptable.

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B60-11.5	Client:	Sound Environmental Strategies
Date Received:	06/17/08	Project:	SOU_0398-002-03_20080617
Date Extracted:	06/18/08	Lab ID:	806194-01 1/5
Date Analyzed:	06/19/08	Data File:	061834.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	50	150
Benzo(a)anthracene-d12	85	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.018
Anthracene	<0.01
Fluoranthene	0.031
Pyrene	0.036
Benz(a)anthracene	0.016
Chrysene	0.018
Benzo(a)pyrene	0.020
Benzo(b)fluoranthene	0.018
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.015
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.013

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B60-16	Client:	Sound Environmental Strategies
Date Received:	06/17/08	Project:	SOU_0398-002-03_20080617
Date Extracted:	06/18/08	Lab ID:	806194-02 1/5
Date Analyzed:	06/18/08	Data File:	061809.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	134	50	150
Benzo(a)anthracene-d12	67	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.013
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.013
Anthracene	<0.01
Fluoranthene	0.019
Pyrene	0.022
Benz(a)anthracene	<0.01
Chrysene	0.012
Benzo(a)pyrene	0.014
Benzo(b)fluoranthene	0.011
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	0.012
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	0.011

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	Not Applicable	Project:	SOU_0398-002-03_20080617
Date Extracted:	06/18/08	Lab ID:	08962mb 1/5
Date Analyzed:	06/18/08	Data File:	061807.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	136	50	150
Benzo(a)anthracene-d12	70	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 06/23/08
Date Received: 06/17/08
Project: SOU_0398-002-03_20080617, F&BI 806194

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	80	84	72-112	5
Acenaphthylene	mg/kg (ppm)	0.17	75	83	68-112	10
Acenaphthene	mg/kg (ppm)	0.17	78	84	70-111	7
Fluorene	mg/kg (ppm)	0.17	86	84	69-110	2
Phenanthrene	mg/kg (ppm)	0.17	78	82	68-111	5
Anthracene	mg/kg (ppm)	0.17	79	81	67-110	2
Fluoranthene	mg/kg (ppm)	0.17	81	85	68-114	5
Pyrene	mg/kg (ppm)	0.17	80	85	68-114	6
Benz(a)anthracene	mg/kg (ppm)	0.17	71	76	58-108	7
Chrysene	mg/kg (ppm)	0.17	82	84	64-115	2
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	73	82	54-119	12
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	83	82	61-123	1
Benzo(a)pyrene	mg/kg (ppm)	0.17	72	76	54-111	5
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	73	77	46-126	5
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	83	83	57-119	0
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	80	82	60-116	2

Note: The calibration verification result for anthracene-d10 exceeded 15% deviation. The average deviation for all compounds was not greater than 15%; therefore, the initial calibration is considered valid.

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

806194

SAMPLE CHAIN OF CUSTODY

ME ~~8~~ 6/17/08 D01/VS1

[redacted] Chris Carter

Company SES

Address

City, State, ZIP

Phone # Fax #

SAMPLERS (*signature*)

PROJECT NAME/NO. Wesner

PO # 0798-002-03

REMARKS Rush please

[redacted] 1 of 1

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH tomorrow ASAP
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date	Time	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	PAHs					Notes
B60-11.5	01 A-D	6-17-08	1840	Soil	4							X					
B60-16	02 A-D	↓	1855	↓	4							X					
																	Samples received at 20 °C

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:	Chris Carter	SES	6-17-08	1600
Received by:	Michael Erdahl	F&B	↓	1600
Relinquished by:				
Received by:				

FORMS\COC\COC.DOC

Friedman & Bruya, Inc. #808005

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

August 14, 2008

Chris Carter, Project Manager
Sound Environmental Strategies Corporation
2400 Airport Way S., Suite 200
Seattle, WA 98134-2020

Dear Mr. Carter:

Included are the results from the testing of material submitted on August 1, 2008 from the SOU_0398-002-03_20080801, F&BI 808005 project. There are 10 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Erin Rothman
SOU0814R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on August 1, 2008 by Friedman & Bruya, Inc. from the Sound Environmental Strategies SOU_0398-002-03_20080801, F&BI 808005 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Sound Environmental Strategies
808005-01	B61-03
808005-02	B61-05
808005-03	B61-08
808005-04	B62-03
808005-05	B62-05
808005-06	B62-08

All quality control requirements were acceptable.

Date of Report: 08/14/08
Date Received: 08/01/08
Project: SOU_0398-002-03_20080801, F&BI 808005
Date Extracted: 08/01/08
Date Analyzed: 08/02/08

RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 53-144)
B61-03 808005-01	16,000	8,900	127
B62-03 808005-04	1,900	3,100	113
Method Blank	<50	<250	106

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B61-03	Client:	Sound Environmental Strategies
Date Received:	08/01/08	Project:	SOU_0398-002-03_20080801, F&BI 808005
Date Extracted:	08/01/08	Lab ID:	808005-01 1/5000
Date Analyzed:	08/04/08	Data File:	080412.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	0 ds	50	150
Benzo(a)anthracene-d12	0 ds	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	490
Acenaphthylene	110
Acenaphthene	130
Fluorene	200
Phenanthrene	620
Anthracene	200
Fluoranthene	350
Pyrene	350
Benz(a)anthracene	160
Chrysene	170
Benzo(a)pyrene	140
Benzo(b)fluoranthene	120
Benzo(k)fluoranthene	54
Indeno(1,2,3-cd)pyrene	76
Dibenz(a,h)anthracene	17
Benzo(g,h,i)perylene	64

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	B62-03	Client:	Sound Environmental Strategies
Date Received:	08/01/08	Project:	SOU_0398-002-03_20080801, F&BI 808005
Date Extracted:	08/01/08	Lab ID:	808005-04 1/500
Date Analyzed:	08/01/08	Data File:	080121.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	0 ds	50	150
Benzo(a)anthracene-d12	0 ds	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	41
Acenaphthylene	16
Acenaphthene	36
Fluorene	51
Phenanthrene	240
Anthracene	64
Fluoranthene	200
Pyrene	190
Benz(a)anthracene	82
Chrysene	91
Benzo(a)pyrene	94
Benzo(b)fluoranthene	83
Benzo(k)fluoranthene	31
Indeno(1,2,3-cd)pyrene	60
Dibenz(a,h)anthracene	12
Benzo(g,h,i)perylene	52

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID: B62-05
Date Received: 08/01/08
Date Extracted: 08/01/08
Date Analyzed: 08/04/08
Matrix: Soil
Units: mg/kg (ppm)

Client: Sound Environmental Strategies
Project: SOU_0398-002-03_20080801, F&BI 808005
Lab ID: 808005-05 1/5
Data File: 080405.D
Instrument: GCMS6
Operator: YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	79	50	150
Benzo(a)anthracene-d12	85	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270C SIM

Client Sample ID:	Method Blank	Client:	Sound Environmental Strategies
Date Received:	NA	Project:	SOU_0398-002-03_20080801, F&BI 808005
Date Extracted:	08/01/08	Lab ID:	08-1217mb2 1/5
Date Analyzed:	08/01/08	Data File:	080106.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm)	Operator:	YA

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	77	50	150
Benzo(a)anthracene-d12	82	35	159

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 08/14/08
Date Received: 08/01/08
Project: SOU_0398-002-03_20080801, F&BI 808005

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 807334-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	108	109	50-150	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	112	70-130

Date of Report: 08/14/08
Date Received: 08/01/08
Project: SOU_0398-002-03_20080801, F&BI 808005

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: 807283-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Naphthalene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthylene	mg/kg (ppm)	<0.01	<0.01	nm
Acenaphthene	mg/kg (ppm)	<0.01	<0.01	nm
Fluorene	mg/kg (ppm)	<0.01	<0.01	nm
Phenanthrene	mg/kg (ppm)	<0.01	<0.01	nm
Anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Benz(a)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Chrysene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(b)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(k)fluoranthene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(a)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	<0.01	<0.01	nm
Dibenz(a,h)anthracene	mg/kg (ppm)	<0.01	<0.01	nm
Benzo(g,h,i)perylene	mg/kg (ppm)	<0.01	<0.01	nm

Laboratory Code: 807283-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	<0.01	90	50-150
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	83	16-167
Acenaphthene	mg/kg (ppm)	0.17	<0.01	86	58-108
Fluorene	mg/kg (ppm)	0.17	<0.01	87	57-113
Phenanthrene	mg/kg (ppm)	0.17	<0.01	86	30-138
Anthracene	mg/kg (ppm)	0.17	<0.01	73	42-132
Fluoranthene	mg/kg (ppm)	0.17	<0.01	82	45-145
Pyrene	mg/kg (ppm)	0.17	<0.01	81	44-139
Benz(a)anthracene	mg/kg (ppm)	0.17	<0.01	80	17-134
Chrysene	mg/kg (ppm)	0.17	<0.01	87	10-157
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	<0.01	82	28-134
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	<0.01	88	55-115
Benzo(a)pyrene	mg/kg (ppm)	0.17	<0.01	76	37-123
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	<0.01	88	61-104
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	<0.01	85	69-100
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	<0.01	85	60-105

Date of Report: 08/14/08
Date Received: 08/01/08
Project: SOU_0398-002-03_20080801, F&BI 808005

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PNA'S BY EPA METHOD 8270C SIM

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	86	91	72-112	6
Acenaphthylene	mg/kg (ppm)	0.17	77	82	68-112	6
Acenaphthene	mg/kg (ppm)	0.17	82	87	70-111	6
Fluorene	mg/kg (ppm)	0.17	81	85	69-110	5
Phenanthrene	mg/kg (ppm)	0.17	81	84	68-111	4
Anthracene	mg/kg (ppm)	0.17	71	73	67-110	3
Fluoranthene	mg/kg (ppm)	0.17	78	78	68-114	0
Pyrene	mg/kg (ppm)	0.17	78	77	68-114	1
Benz(a)anthracene	mg/kg (ppm)	0.17	75	78	58-108	4
Chrysene	mg/kg (ppm)	0.17	81	85	64-115	5
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	78	80	54-119	3
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	80	85	61-123	6
Benzo(a)pyrene	mg/kg (ppm)	0.17	66	70	54-111	6
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	80	81	46-126	1
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	79	85	57-119	7
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	79	85	60-116	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probablility.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

808005

ME 8/01/08 CO4/VS2

SAMPLE CHAIN OF CUSTODY

Send Report To Chris Carter cc Ed. Rotman
Company SES
Address 2400 Airport Way S.
City, State, ZIP Seattle, WA
Phone # 206-306-1900 Fax #

SAMPLERS *(signature)*

PROJECT NAME/NO. Former Wasmer Property

PO # 0398-002-03

REMARKS

GEMS Y / [✓ N]

Page # 1 of 1

TURNAROUND TIME
☐ Standard (2 Weeks)
☒ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

								ANALYSES REQUESTED								
Sample ID	Sample Location	Sample Depth	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	NWTPH-Dx	NWTPH-Gx	BTEX by 8021B	VOC's by 8260	SVOC's by 8270	RCRA-8 Metals	PAH's		Notes
B61-03	0		01A-E	8-1-08	0935	S	5	X						X		← Rush
B61-05			02A-E	↓	0955	↓	↓									← hold
B61-08			03A-E		1005											← hold
B62-03			04A-E		1020			X						X		← Rush
B62-05			05A-E		1035									X		← hold
B62-08			06A-E		1045											← hold

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:	Ben Schnyer	SES	8-1-08	12:30
Received by:	Michael Erdahl	F&B inc	1	1
Relinquished by:				
Received by:				

FORMS\COC\SESGEMSR1.DOC (Revision 1)

APPENDIX G

Terrestrial Ecological Evaluation Form

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION EXCLUSION FORM

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

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

Step 1: IDENTIFY HAZARDOUS WASTE SITE AND EVALUATOR

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

Facility/Site Name: Former Wesmar Property

Facility/Site Address: 1451 46th Street Northwest, Seattle, Washington

Facility/Site No: VCP Project No.:

Name of Evaluator:

Step 2: DOCUMENT BASIS FOR EXCLUSION

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

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

1-☐ No contamination present at site.

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

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

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

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

5-☒ All contaminated soil, is or will be, covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife and an institutional control has been implemented as required by WAC 173-340-440. *An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.*

Step 2: DOCUMENT BASIS FOR EXCLUSION – CONTINUED

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

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

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

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

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

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

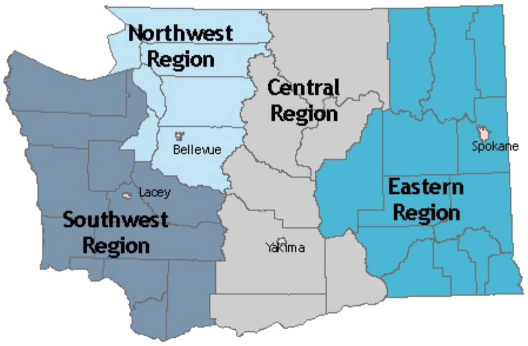
8-☐ Concentrations of hazardous substances in soil do not exceed background levels as described in WAC 173-340-709.

Step 3: PROVIDE EXPLANATION FOR EXCLUSION (IF NECESSARY)

Attach additional pages if necessary.

Step 4: SUBMITTAL

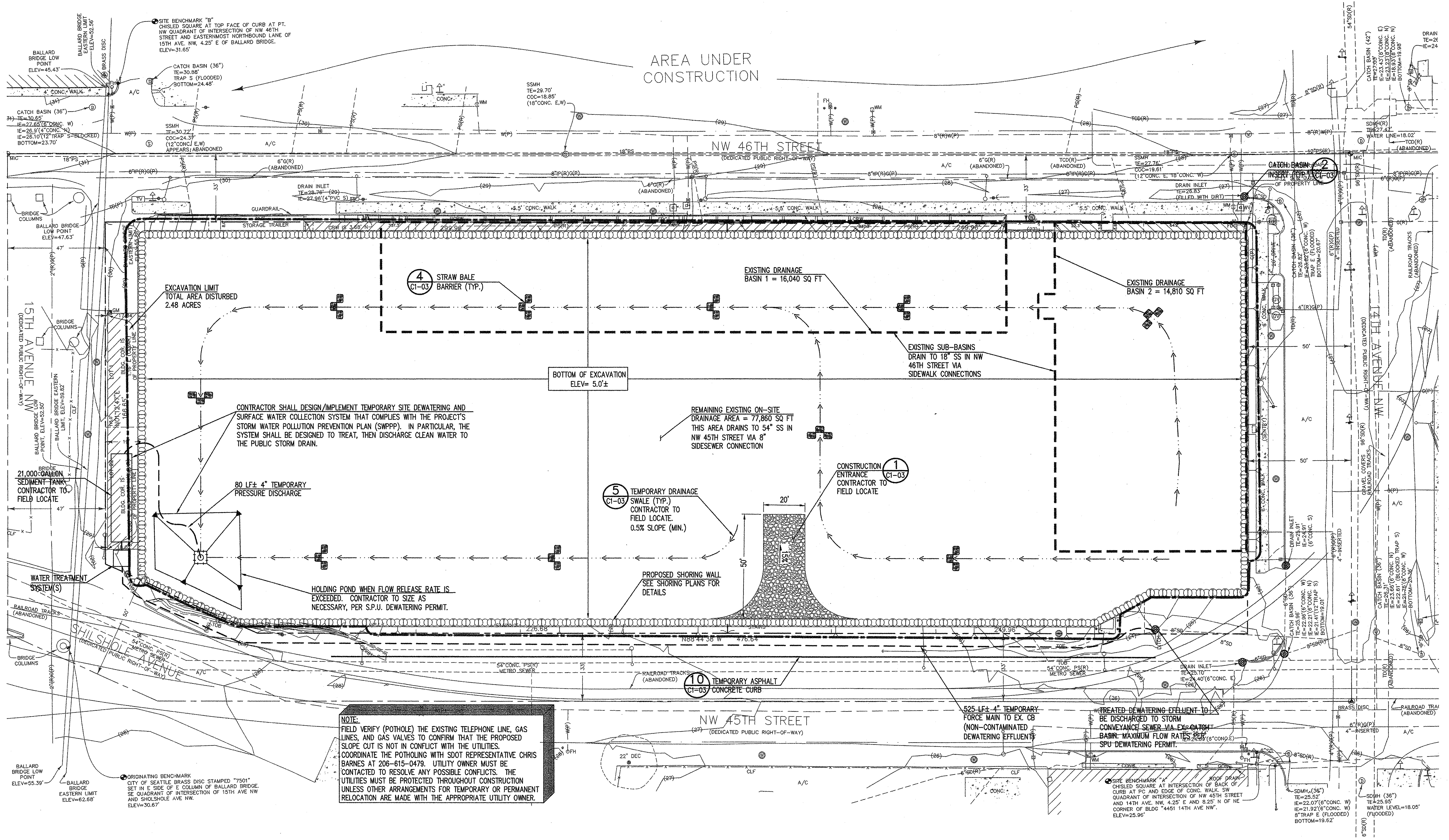
Please mail your completed form to Ecology at the appropriate time, either with your VCP application or with a subsequent request for a written opinion. If you complete the form after you enter the VCP, please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: Dale Myers 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: Mark Dunbar 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: Bob Warren P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Patti Carter N. 4601 Monroe Spokane WA 99205-1295

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

Appendix H
Clark Design Group, PLLC
Selected Sheets from 2008 Construction Plan Set, Revised March 31, 2009



NOTE:
FIELD VERIFY (POTHOLE) THE EXISTING TELEPHONE LINE, GAS LINES, AND GAS VALVES TO CONFIRM THAT THE PROPOSED SLOPE CUT IS NOT IN CONFLICT WITH THE UTILITIES. COORDINATE THE POTHOLING WITH SDOT REPRESENTATIVE CHRIS BARNES AT 206-615-0479. UTILITY OWNER MUST BE CONTACTED TO RESOLVE ANY POSSIBLE CONFLICTS. THE UTILITIES MUST BE PROTECTED THROUGHOUT CONSTRUCTION UNLESS OTHER ARRANGEMENTS FOR TEMPORARY OR PERMANENT RELOCATION ARE MADE WITH THE APPROPRIATE UTILITY OWNER.

TEMPORARY EROSION AND SEDIMENTATION CONTROL (TESC) NOTES:

1. REFER TO SHEET CO-01 FOR ADDITIONAL NOTES, ABBREVIATIONS, AND LEGEND.
2. THE CONTRACTOR SHALL VERIFY THE BOTTOM OF FOOTING ELEVATIONS WITH THE STRUCTURAL ENGINEER PRIOR TO THE START OF EXCAVATION.
3. BOTTOM OF EXCAVATION ELEVATION IS BASED ON ARCHITECTURAL FINISHED FLOOR LESS 4-INCHES SLAB-ON-GRADE AND 4-INCH CAPILLARY BREAK MATERIAL. CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION.
4. THE IMPLEMENTATION, CONSTRUCTION, MAINTENANCE, REPLACEMENT AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS APPROVED.
5. THE ESC FACILITIES SHOWN ON THESE PLANS MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE, ENTER THE DRAINAGE SYSTEM OR VIOLATE APPLICABLE WATER STANDARDS.
6. THE ESC FACILITIES SHOWN ON THESE PLANS ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. THE CONTRACTOR SHALL UPGRADE THE ESC FACILITIES TO ACCOUNT FOR SEVERE STORM EVENTS.
7. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE CONTRACTOR AND MAINTAINED AS NECESSARY OR AS DIRECTED BY THE CITY OF SEATTLE INSPECTOR TO INSURE THEIR CONTINUED FUNCTIONING.
8. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. WATER FROM DISTURBED AREAS SHALL BE DIRECTED TO A SEDIMENT POND VIA SHEET FLOW OR TEMPORARY DRAINAGE DITCHES, CONSTRUCTED AS NEEDED, OR AS DIRECTED BY THE CITY OF SEATTLE INSPECTOR.
10. CONTRACTOR SHALL PROVIDE CONSTRUCTION FENCING AS REQUIRED FOR SAFETY AND AS DIRECTED BY THE CITY INSPECTOR.
11. THE CONTRACTOR SHALL PROVIDE BACKUP PUMPS WITH SUFFICIENT HORSEPOWER TO DELIVER STORM WATER INTO SEDIMENT TANK AS SHOWN ON THE PLANS.
12. APPROVAL OF THE DRAINAGE AND TEMPORARY EROSION CONTROL PLANS DOES NOT INCLUDE APPROVAL OF THE GRADING SHOWN HEREIN. GRADING ACTIVITIES WITHIN THE RIGHT-OF-WAY REQUIRE A STREET USE PERMIT FROM SDOT. GRADING ACTIVITIES ON ADJACENT PROPERTIES REQUIRE WRITTEN APPROVAL BY THE ADJACENT PROPERTY OWNER.
13. CATCH BASINS IN THE STREET SHALL BE INSPECTED DAILY BY THE CONTRACTOR. WATER LEAVING THE SITE DURING CONSTRUCTION, INCLUDING WATER CARRIED BY TRUCK TIRES, SHALL BE CLEAN. THE CONTRACTOR SHALL CLEAN CATCH BASINS AND IMPLEMENT EXTRA SEDIMENTATION CONTROL METHODS IF NECESSARY AND AS DIRECTED BY THE CITY OF SEATTLE INSPECTOR.
14. CONTRACTOR SHALL PREVENT ON-SITE EROSION BY STABILIZING ALL SOILS, INCLUDING STOCK PILES, THAT ARE TEMPORARILY EXPOSED. GRADING MUST BE STABILIZED BY OCTOBER 31, AND NO EXCAVATION SHALL BE PERFORMED BETWEEN OCTOBER 31 AND APRIL 1 WITHOUT AN APPROVED DRY SEASON GRADING EXTENSION LETTER FROM DPD.
15. NO SEDIMENT SHALL BE TRACKED INTO THE STREET OR ONTO PAVED SURFACES. SEDIMENT SHALL BE REMOVED FROM TRUCKS AND EQUIPMENT PRIOR TO LEAVING THE SITE. CONTRACTOR SHALL MAKE PROVISIONS TO WASH VEHICLE TIRES, WHEELS, AND EXTERIORS BEFORE LEAVING SITE. IN THE EVENT OF FAILURE OF THE EROSION CONTROL SYSTEM RESULTING IN SEDIMENT BEING TRACKED ONTO PAVED SURFACES, THE CONTRACTOR SHALL IMMEDIATELY IMPLEMENT MEASURES TO CORRECT THE SITUATION, AND STREET SWEEPING SHALL BE EMPLOYED ON AN EMERGENCY BASIS. IF STREET SWEEPING VEHICLES ARE UTILIZED, THEY SHALL BE OF THE TYPE THAT ACTUALLY REMOVES THE SEDIMENT FROM THE PAVEMENT.
16. CONTRACTOR SHALL IMPLEMENT A DUST CONTROL STRATEGY.
17. ALL NOTES FOUND ON THE CITY'S TESC STANDARD PLANS SHALL APPLY TO THIS PROJECT.
18. FOR CONSTRUCTION INGRESS/EGRESS, CONTRACTOR WILL PRODUCE A CONSTRUCTION TRAFFIC PLAN FOR RIGHT-OF-WAY USE PERMIT.
19. FORCE MAIN SHOWN ON PLAN IS SCHEMATIC IN NATURE. FORCE MAIN SHALL BE LOCATED WITHIN THE PROPERTY LINE AND SHALL BE PROTECTED BY FENCING OR ANOTHER APPROVED METHOD.

LEGEND

PROPERTY LINE	——— — — ———
EXCAVATION LIMITS	━━ ▬ ━━ ▬ ━━
DRAINAGE BASIN LIMITS	▬ ▬ ▬ ▬ ▬
TEMPORARY DRAINAGE SWALE	—>· · ·—>· · ·—
TEMPORARY ASPHALT CURB	————

GRAPHIC SCALE
0 10 20 40
1 inch = 20 ft.

SEE SHEET C1.01A FOR ADDITIONAL TESC NOTES

CLARK
DESIGN GROUP PLLC
169 Western Avenue W
Seattle, Washington 98119
Tel 206 782 8208 Fax 206 782 7818

1451 / 1401 NW 46TH STREET
SEATTLE, WA 98107

TITLE:	TESC PLAN
SCALE:	AS NOTED
DATE:	08/01/08
DWN BY:	MSM,WAB,LHT
CHK BY:	SSM,MFC
DPD NO.	6156775/6156774
JOB NO.	107440.2
MUP	10/31/07
PERMIT	11/14/07
PERMIT REV 1	05/19/08
COORD. SET	08/01/08
CONSTR. SET	10/15/08
CONSTR. REV 1	03/31/09

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MARTIN F. CHASE
28482

SHEET NO:
C1-01

SOURCE CONTROL BMP NOTES:

PROVIDE SOURCE CONTROL BMP'S PER SWPPP INCLUDING BUT NOT LIMITED TO:

1. DISPOSE OF ALL CONSTRUCTION DEBRIS IN THE APPROPRIATE UPLAND FACILITIES
2. CONTRACTOR SHALL IMPLEMENT A SPILL PREVENTION CONTROL AND CONTAINMENT PLAN PER THE SEATTLE SOURCE CONTROL TECHNICAL REQUIREMENTS MANUAL AND ENSURE THAN AN EMERGENCY SPILL-CONTAINMENT KIT IS ON HAND TO CONTAIN ANY HYDRAULIC FLUID OR OTHER PETROLEUM PRODUCTS SHOULD ANY DISCHARGE INTO THE WATER OCCUR.
3. CHECK EQUIPMENT USING OIL, GASOLINE, OR DIESEL USED ON SITE FOR EVIDENCE OF LEAKAGE, DAILY, IF EVIDENCE OF LEAKAGE IS FOUND THE FURTHER USE OF SUCH EQUIPMENT SHALL BE SUSPENDED UNTIL THE DEFICIENCY HAS BEEN SATISFACTORILY CORRECTED.
4. INSTALL A SILT CURTAIN AROUND THE WORK AREAS.
5. IF FLOATING DEBRIS ENTERS THE WATER DURING THE PROPOSED WORK THIS DEBRIS SHALL BE REMOVED IMMEDIATELY AND STORED UNTIL IT CAN BE DISPOSED OF AT AN APPROPRIATE UPLAND FACILITY.
6. IF HEAVY (SINKING) DEBRIS ENTERS THE WATER DURING THE PROPOSED WORK, THE LOCATION OF THE DEBRIS SHALL BE DOCUMENTED. WHEN CONSTRUCTION IS COMPLETE, A DIVER SHALL RETRIEVE ALL DEBRIS THAT HAS ENTERED THE WATER AND SUNK DURING THE PROPOSED WORK.

DEWATERING NOTES:

1. SOIL AND GROUNDWATER CONTAMINATION HAS BEEN IDENTIFIED DURING THIS PROJECT'S PRELIMINARY FIELD INVESTIGATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO: PETROLEUM HYDROCARBONS (AS DIESEL-RANGE); BENZENE, TOLUENE, ETHYL BENZENE AND XYLENES (BTEX); METHYL TERTIARY BUTYL ETHER (MTBE) AND METALS (SEE PROJECT'S ENVIRONMENTAL REPORTS). THE PROJECT TEAM ESTIMATES AN INITIAL DRAWDOWN OF APPROXIMATELY 1.8 MILLION GALLONS TO OCCUR OVER 35 DAYS. POST DRAWDOWN, APPROX. 17,000 GALLONS PER DAY (GPD) OF COMBINED GROUNDWATER (FROM DEWATERING) PLUS STORMWATER MAY OCCUR UNTIL THE SECANT PILE SHORING WALL AREA IS CONSTRUCTED. REMAINING SEEPS ARE ESTIMATED AT A MAXIMUM OF 600 GPD. THE DEWATERING ACTIVITIES REQUIRE DISCHARGE FROM THE SITE DURING CONSTRUCTION. TEMPORARY SUMPS SHALL BE EMPLOYED TO RECOVER CONSTRUCTION--RELATED GROUNDWATER AND STORMWATER AS SPECIFIED ON THE TEMPORARY EROSION AND SEDIMENTATION CONTROL PLAN (TESC).
2. ALL SITE DRAINAGE AND GROUNDWATER (DURING CONSTRUCTION) SHALL BE TREATED THEN DISCHARGED TO THE EXISTING STORM CONVEYANCE SYSTEM IN 14TH AVE NW, WHICH DISCHARGES TO SALMON BAY. ALL DISCHARGES MUST MEET STATE WATER QUALITY REQUIREMENTS FOR ALL REGULATED PARAMETERS, INCLUDING, BUT NOT LIMITED TO: TURBIDITY (REPORTED AS NTU), TEMPERATURE, DISSOLVED OXYGEN, PH AND OTHER REGULATED CONTAMINANTS INCLUDING THOSE LISTED ABOVE). MAXIMUM LEVELS AND THRESHOLDS FOR THESE PARAMETERS ARE GENERALLY REGULATED BY WASHINGTON STATE DEPARTMENT OF ECOLOGY'S SURFACE WATER QUALITY STANDARDS FOR FRESH WATERS UNDER 173-201A WAC. FOR CONTAMINANTS THAT DO NOT HAVE SURFACE WATER QUALITY STANDARDS, MAXIMUM LEVELS IN SITE DISCHARGES SHALL NOT EXCEED ECOLOGY'S MODEL TOXIC CONTROL ACT (MTCA) METHOD A CLEANUP LEVELS FOR GROUND WATER UNDER WAC 173-340-900, TABLE 720-1.
3. TABLE 1, SHEET C1-03, PROVIDES A BEST ESTIMATE OF THE ANTICIPATED INFLUENT CONSTRUCTION WATER QUALITY BASED ON GROUNDWATER QUALITY ANALYSIS CONDUCTED TO DATE, AND PROVIDES THE RESPECTIVE ANTICIPATED DISCHARGE WATER QUALITY STANDARDS. NOTE THAT THE INFLUENT CONSTRUCTION WATER QUALITY CANNOT BE CONFIRMED UNTIL WATER IS RECOVERED DURING CONSTRUCTION. NEVERTHELESS, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE APPROPRIATE TREATMENT EQUIPMENT TO ACHIEVE EACH DISCHARGE STANDARD. THE ANTICIPATED MINIMUM REQUIRED TREATMENT TECHNOLOGIES ARE SOLIDS REMOVAL EQUIPMENT (MEDIA FILTRATION OR BAG FILTERS) TO ADDRESS THE TURBIDITY AND METALS DISCHARGE LIMIT, AND LIQUID-PHASE GRANULAR ACTIVATED CARBON FOR THE TREATMENT OF DISSOLVED PETROLEUM-RELATED ORGANIC CONTAMINANTS (GRPH, DRPH, BTEX) AND TRACE DISSOLVED METALS. THE CONTRACTOR MAY PROVIDE ALTERNATIVE TECHNOLOGIES TO ACHIEVE THE REQUIRED DISCHARGE LIMITS. IT IS THE OWNER'S RESPONSIBILITY TO SAMPLE, PERFORM TESTING, AND MONITOR ALL SITE DISCHARGES TO ENSURE THAT STATE WATER QUALITY REQUIREMENTS ARE MET FOR ALL CONSTRUCTION DISCHARGES. IF THE OWNER DETERMINES THAT THE CONTRACTOR'S TREATMENT EQUIPMENT IS NOT MEETING STATE WATER QUALITY REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY CEASE DISCHARGE AND CONSULT WITH THE OWNER IN ORDER TO PROCURE AND INSTALL THE TREATMENT EQUIPMENT NECESSARY TO ACHIEVE THE DISCHARGE STANDARDS. DISCHARGE FROM THE SITE SHALL NOT COMMENCE UNTIL THE OWNER'S SAMPLES INDICATE COMPLIANCE WITH THE DISCHARGE LIMITS.
4. THE POINT OF DISCHARGE FOR THE PROJECT SHALL BE TO THE EXISTING STORM CONVEYANCE SYSTEM IN 14TH AVE NW. ADDITIONAL TEMPORARY CONNECTIONS TO PUBLIC UTILITY STRUCTURES (SUCH AS MAINTENANCE HOLES AND CATCH BASINS) ARE EXPRESSLY PROHIBITED. DISCHARGE TO THE RIGHT-OF-WAY (ROW) OR PUBLIC PLACE (SUCH AS CURB DISCHARGES) IS ALSO NOT PERMITTED WITHOUT APPROVAL BY SPU, DPD AND SEATTLE DEPARTMENT OF TRANSPORTATION (SDOT).
5. DURING EXCAVATION OF CONTAMINATED SOIL, SOUND ENVIRONMENTAL STRATEGIES SHALL BE THE DESIGNATED ORGANIZATION RESPONSIBLE FOR OVERSIGHT OF THE TESC/CONTAMINATION CLEANUP. SEE EMERGENCY CONTACT INFORMATION.

DISCHARGE STANDARDS:

TABLE 1

PARAMETER	ANTICIPATED AVE. INFLUENT QUALITY	DISCHARGE STANDARD	SOURCE OF STANDARD
TURBIDITY	5.0- >200 NTU	5 NTU OVER BACKGROUND WHEN BACKGROUND IS <50; A 10% INCREASE WHEN BACKGROUND IS > 50 NTU	WAC 173-201A-200 TABLE 200 (1) (E)
pH	6.5-8.5	6.5-8.5	WAC 173-201A-200 TABLE 200 (1) (G)
ARSENIC	<1.0 - 1,170 μg/L	190 μg/L	WAC 173-201A-240; TABLE 240 (3); FRESH WATER CHRONIC CRITERIA (SEE TABLE FOOTNOTES IN WAC)
CHROMIUM (TRI) *	7.0-64.0 μg/L	50 μg/L	METHOD A CLEANUP LEVELS FOR GROUND WATER UNDER WAC 173-340-900, TABLE 720-1 *DISCHARGE STANDARD BASED ON WATER HARDNESS- MAY BE RECALCULATED WITH ADDITIONAL WATER TESTING DATA
LEAD *	<1.0 - 77.4 μg/L	15 μg/L	METHOD A CLEANUP LEVELS FOR GROUND WATER UNDER WAC 173-340-900, TABLE 720-1 *DISCHARGE STANDARD BASED ON WATER HARDNESS- MAY BE RECALCULATED WITH ADDITIONAL WATER TESTING DATA
DIESEL-RANGE PETROLEUM HYDROCARBONS	<50.0 - 520.0 μg/L	500 μg/L	METHOD A CLEANUP LEVELS FOR GROUND WATER UNDER WAC 173-340-900, TABLE 720-1
NAPHTHALENE	<1.0- 170 μg/L	160 μg/L	METHOD A CLEANUP LEVELS FOR GROUND WATER UNDER WAC 173-340-900, TABLE 720-1

SEE SHEET C1.01 FOR TESC PLAN

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1451 / 1401 NW 46TH STREET
SEATTLE, WA 98107

©CDG

TITLE:	TESC NOTES
SCALE:	AS NOTED
DATE:	08/01/08
DWN BY:	MSM,WAB,LHT
CHK BY:	SSM,MFC
DPD NO.	6156775/6156774
JOB NO.	107440.2
MUP	10/31/07
PERMIT	11/14/07
PERMIT REV 1	05/19/08
COORD. SET	08/01/08
CONSTR. SET	10/15/08
CONSTR. REV 1	03/31/09

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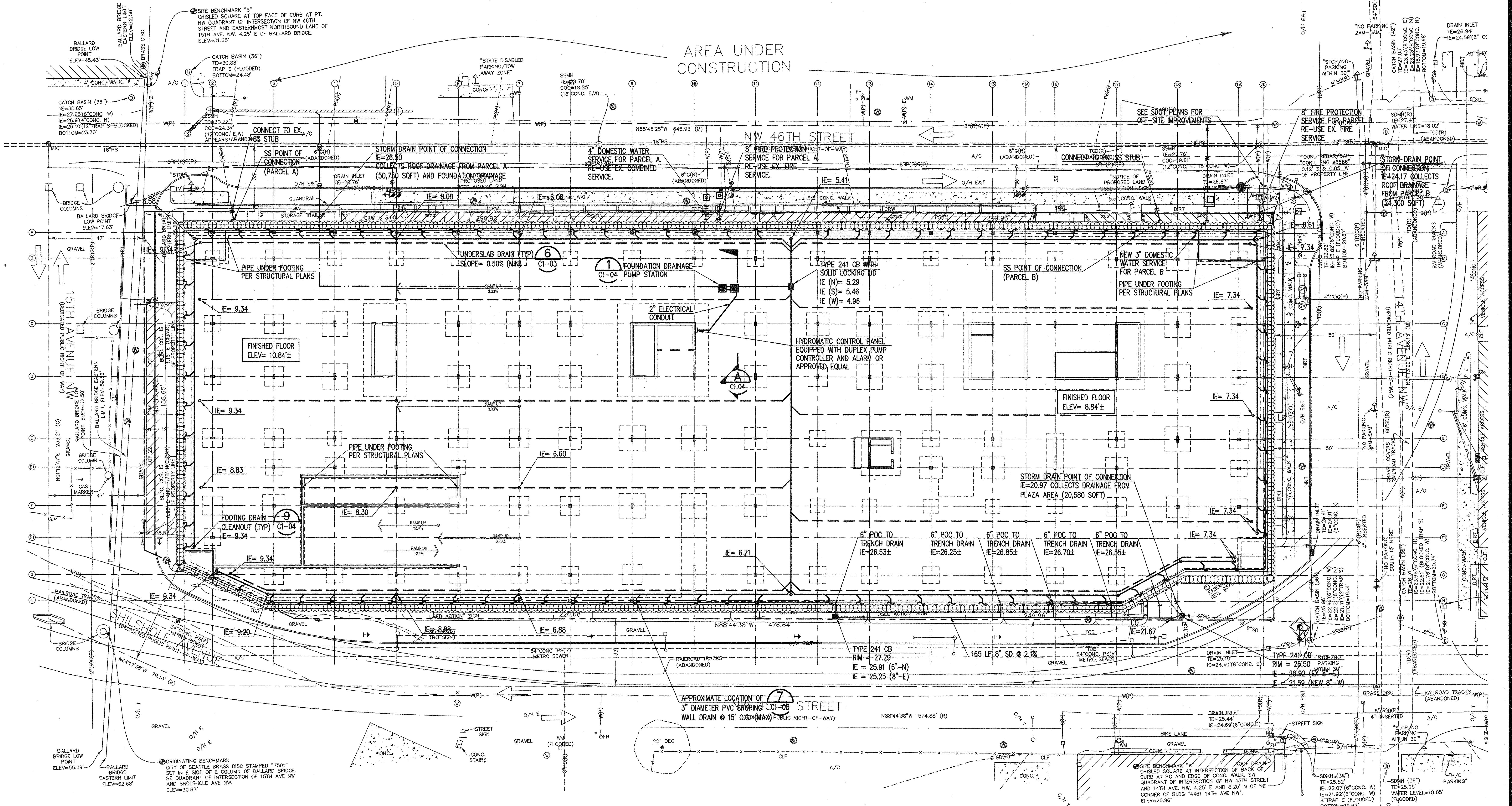
MARTIN F. CHASE
28482

SHEET NO:

C1-01A



FOUNDATION DRAINAGE NOTES

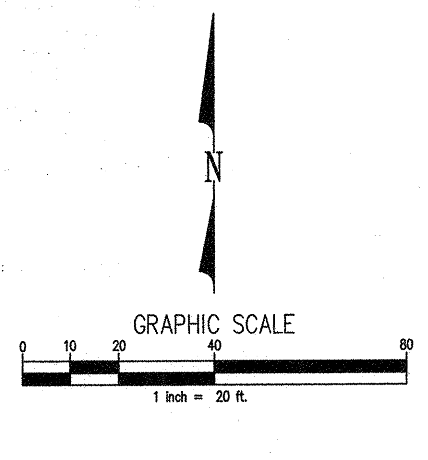
1. SEE SHEET C0-01 FOR ADDITIONAL NOTES, LEGEND, AND ABBREVIATIONS.
2. FOOTING DRAIN CLEANOUT INVERTS SHALL BE SET A MINIMUM OF 1.33 FEET BELOW CONCRETE SLAB FINISHED FLOOR ELEVATION, UNLESS OTHERWISE NOTED ON THE PLANS.
3. PERIMETER DRAINS, WALL CONNECTIONS, AND UNDERSLAB DRAINS ARE SHOWN FOR GRAPHIC REPRESENTATION ONLY, AND MEET THE MINIMUM REQUIREMENTS FOR GROUNDWATER CONTROL. THE CONTRACTOR SHALL VERIFY THEIR LOCATIONS WITH THE OWNER'S GEOTECHNICAL REPRESENTATIVE IN THE FIELD, AND ADJUST THEM TO OBTAIN FULL COVERAGE FOR GROUNDWATER CONTROL.
4. SHORING WALL, FOUNDATIONS, AND FOOTINGS ARE SHOWN FOR INFORMATION ONLY. SEE STRUCTURAL PLANS FOR CONSTRUCTION.
5. FINISHED FLOOR SLAB ELEVATIONS VARY. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR SLAB ELEVATIONS.
6. SEE SHEET C1-03 FOR FOUNDATION DRAINAGE DETAILS.
7. PIPE ENCASED WITHIN THE FOUNDATION SHALL HAVE PIPE CASING SURROUNDING IT TO PROVIDE SEPARATION BETWEEN PIPE AND FOUNDATION.

LEGEND

— — — — — —	4" PVC PERFORATED FOOTING DRAIN PIPE
———————	4" PVC SOLID WALL PIPE
⌐	CLEANOUT
⌐	WYE CONNECTION
⊢	3" WALL DRAIN CONNECTION
—··—··—	2" HDPE FORCE MAIN

UTILITY NOTES

1. CONNECTIONS TO EXISTING WATER MAINS TO BE PERFORMED BY SEATTLE PUBLIC UTILITIES (SPU). THE NEW SERVICE LINES WILL BE EXTENDED TO 2' OUTSIDE OF METER BOX BY SPU AND WILL INCLUDE METER INSTALLATION, EXCAVATION, BACKFILL, AND PAVEMENT RESTORATION.
2. CONTRACTOR SHALL LOCATE AND VERIFY SIZE AND CONDITION OF SIDE SEWERS WITH CITY OF SEATTLE INSPECTOR PRIOR TO CONNECTION.



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SEATTLE, WA 98107

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TITLE:	DRAINAGE AND UTILITY PLAN
SCALE:	AS NOTED
DATE:	08/01/08
DWN BY:	MSM,WAB,LHT
CHK BY:	SSM,MFC
DPD NO.	6156775/6156774
JOB NO.	107440.2
MUP	10/31/07
PERMIT	11/14/07
PERMIT REV ▷1	05/19/08
COORD. SET	08/01/08
CONSTR. SET	10/15/08
CONSTR. REV ▷1	03/31/09

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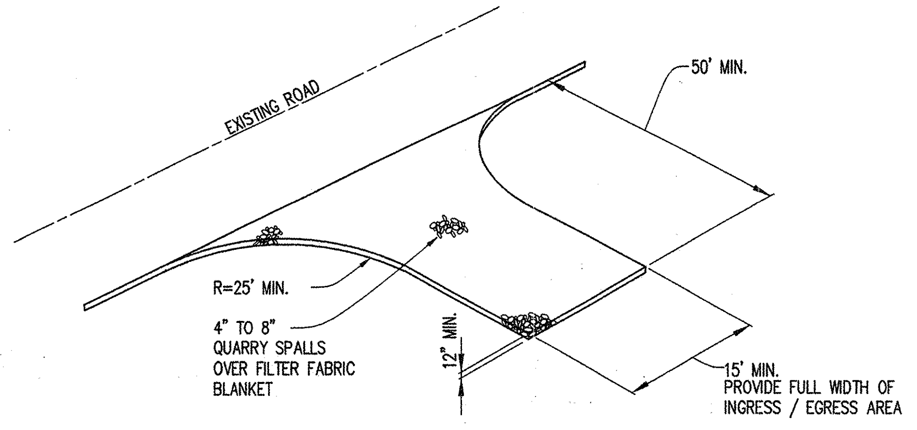
MARTIN F. CHASE
28482

SHEET NO:

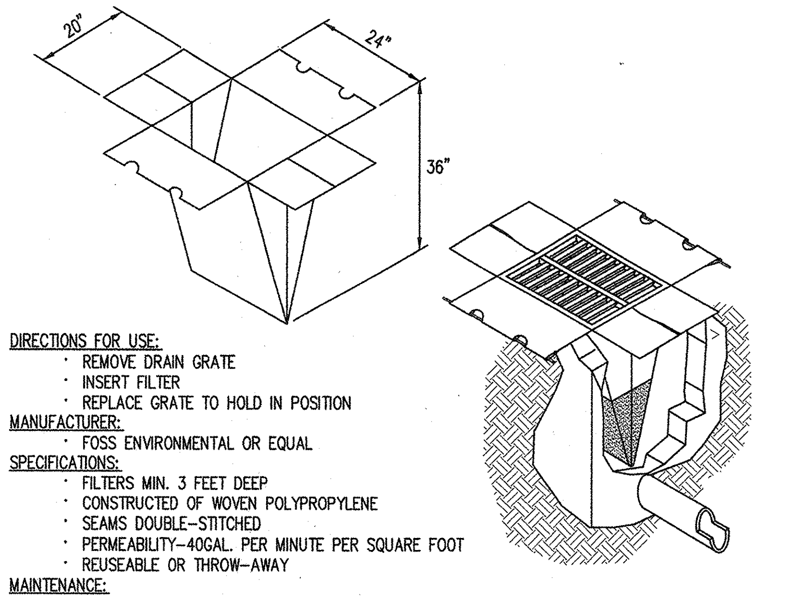
C1-02



CONSTRUCTION ENTRANCE DETAIL

NTS

1
C1-01



<u>DIRECTIONS FOR USE:</u>
- REMOVE DRAIN GRATE
- INSERT FILTER
- REPLACE GRATE TO HOLD IN POSITION

<u>MANUFACTURER:</u>
- FOSS ENVIRONMENTAL OR EQUAL

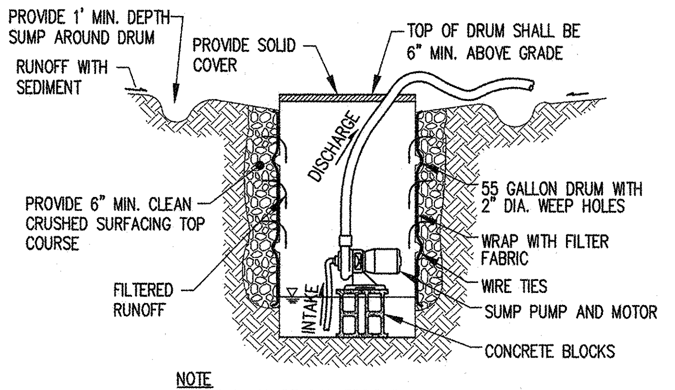
<u>SPECIFICATIONS:</u>
- FILTERS MIN. 3 FEET DEEP
- CONSTRUCTED OF WOVEN POLYPROPYLENE
- SEAMS DOUBLE-STITCHED
- PERMEABILITY-40GAL. PER MINUTE PER SQUARE FOOT
- REUSEABLE OR THROW-AWAY

<u>MAINTENANCE:</u>
- REMOVE WHEN FILLED TO HALF-WAY MARK (USE FRONT-LOADER OR OTHER EQUIPMENT FOR REMOVAL)
- CLEAN AND RE-USE, OR REPLACE

CATCH BASIN INSERT DETAIL

NTS

2
C1-01

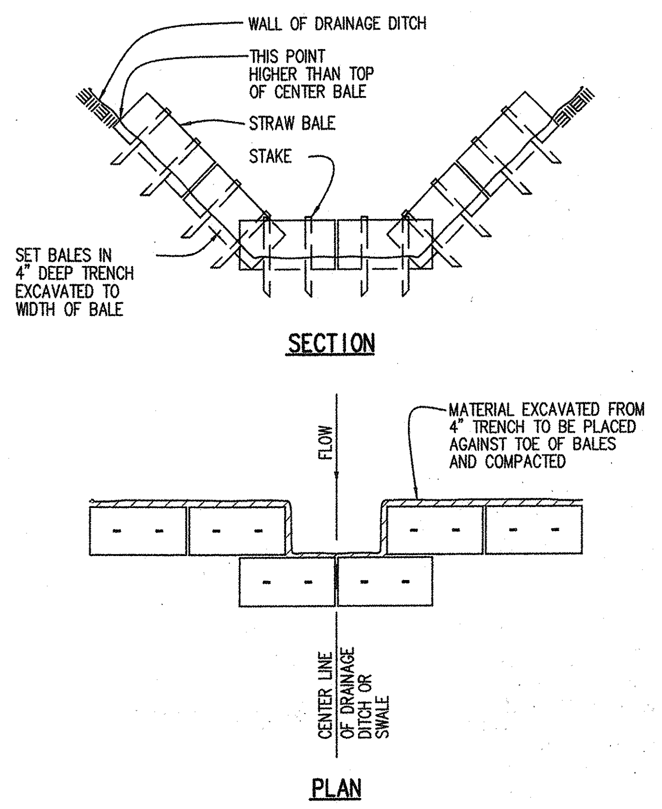


<u>NOTE</u>
PUMPS SHALL BE SUBMERSIBLE, AND HAVE A CAPACITY OF 0.35 CFS (160 GPM).

MOBILE 55 GALLON DRUM WITH PUMP DETAIL

NTS

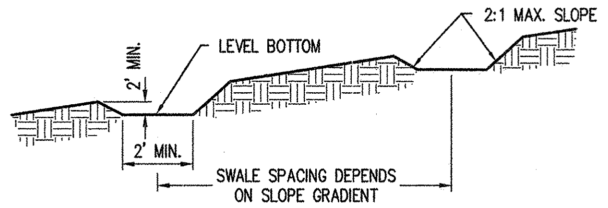
3
C1-01



STRAW BALE BARRIER

NTS

4
C1-01



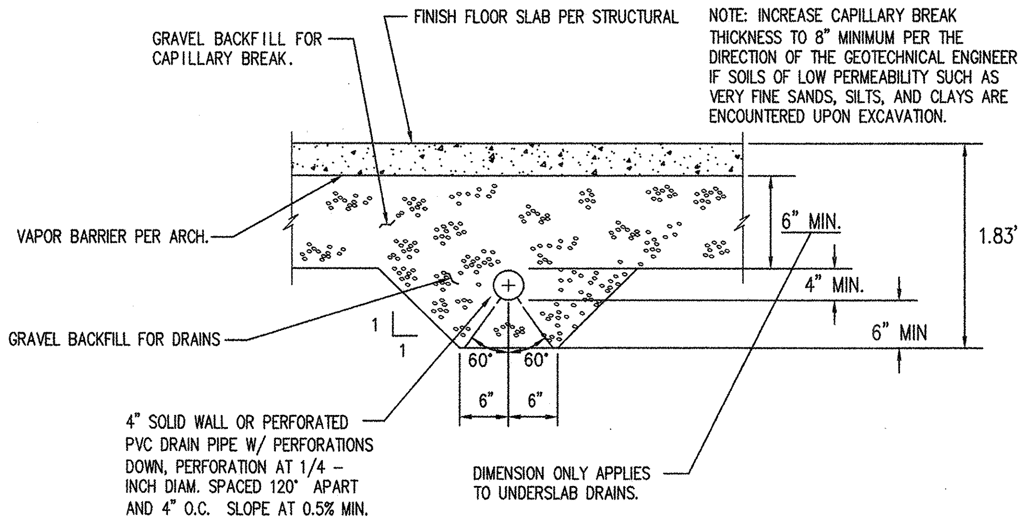
<u>MAINTENANCE STANDARDS</u>

1. DAMAGE RESULTING FROM RUNOFF OR CONSTRUCTION ACTIVITY SHALL BE REPAIRED IMMEDIATELY.
2. IF THE FACILITIES DO NOT REGULARLY RETAIN STORM RUNOFF, THE CAPACITY AND/OR FREQUENCY OF THE DIKES/SWALES SHALL BE INCREASED.

TEMPORARY DRAINAGE SWALE

NTS

5
C1-01

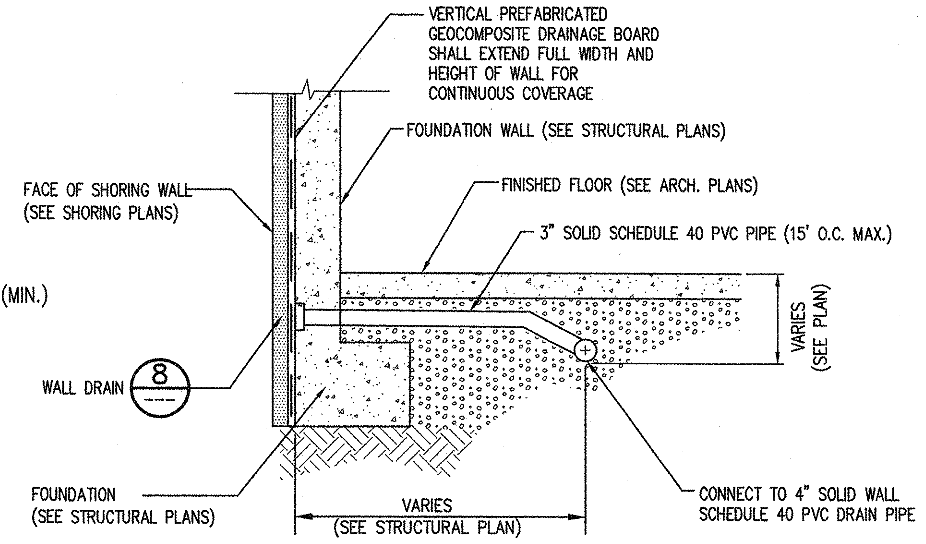


NOTE: INCREASE CAPILLARY BREAK THICKNESS TO 8" MINIMUM PER THE DIRECTION OF THE GEOTECHNICAL ENGINEER IF SOILS OF LOW PERMEABILITY SUCH AS VERY FINE SANDS, SILTS, AND CLAYS ARE ENCOUNTERED UPON EXCAVATION.

FOUNDATION DRAIN SECTION

NTS

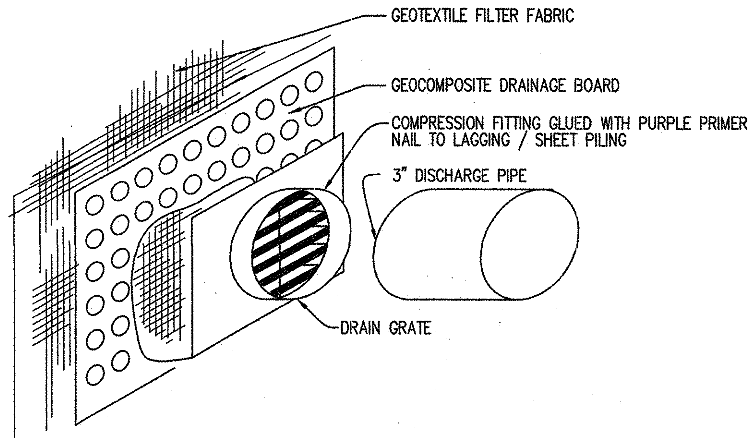
6
C1-02



WALL DRAIN CONNECTION SECTION

NTS

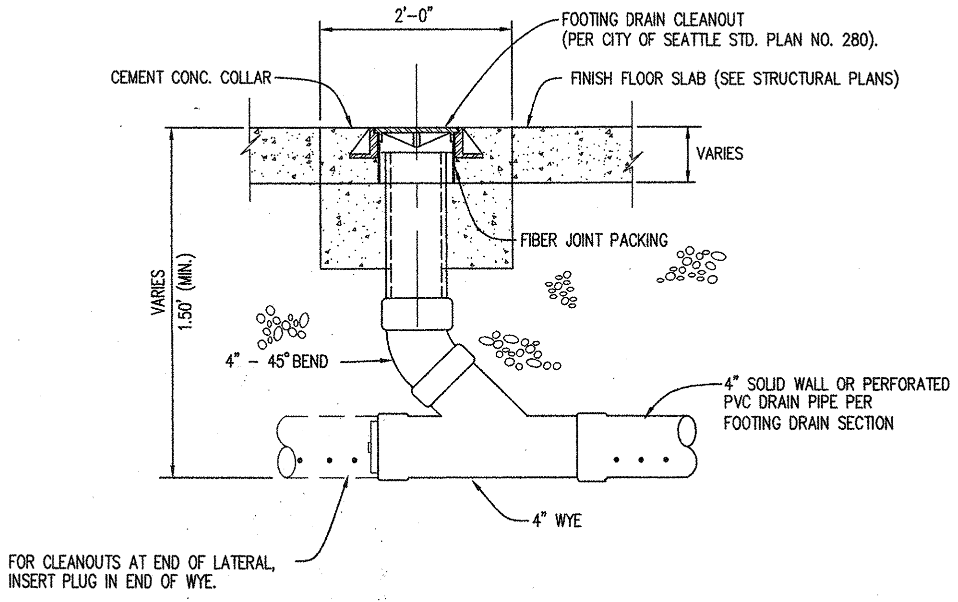
7
C1-02



WALL DRAIN DETAIL

NTS

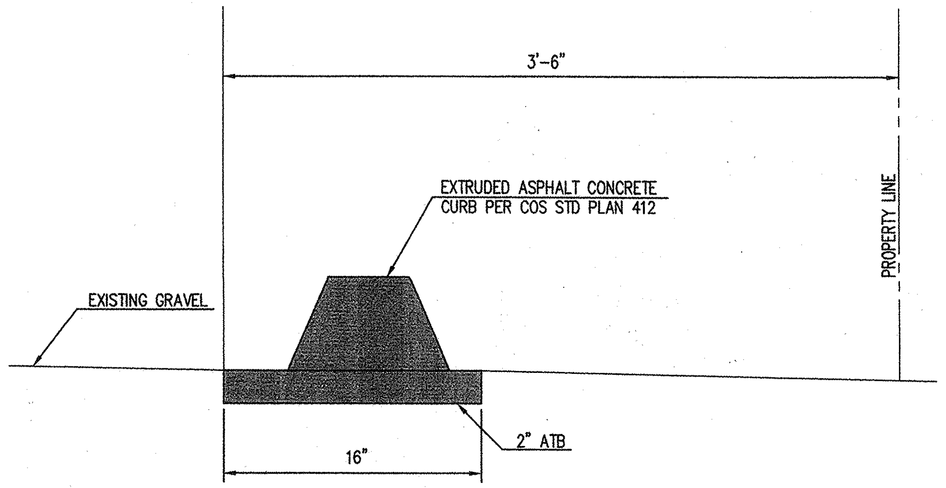
8



FOOTING DRAIN CLEANOUT DETAIL

NTS

9
C1-02



TEMPORARY ASPHALT CONCRETE CURB DETAIL

NTS

10
C1-01

NOTES

1. SEE SHEET C0-01 FOR ADDITIONAL NOTES, ABBREVIATIONS, AND LEGEND.

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TESC & FOUNDATION
TITLE: DRAINAGE DETAILS
SCALE: AS NOTED
DATE: 08/01/08
DWN BY: MSM,WAB,LHT
CHK BY: SSM,MFC
DPD NO. 6156775/6156774
JOB NO. 107440.2
MUP 10/31/07
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CONSTR. REV 1 03/31/09

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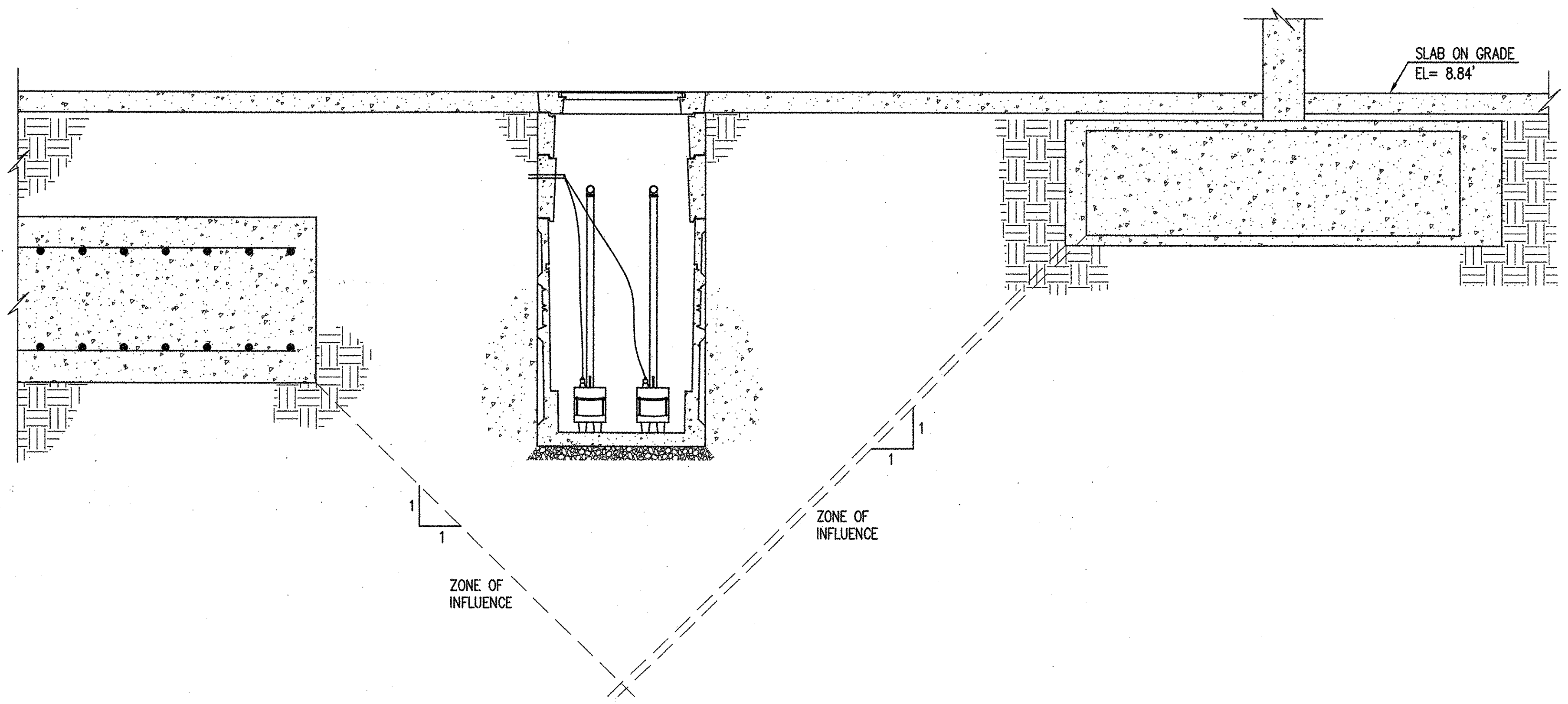
SHEET NO:
C1-03

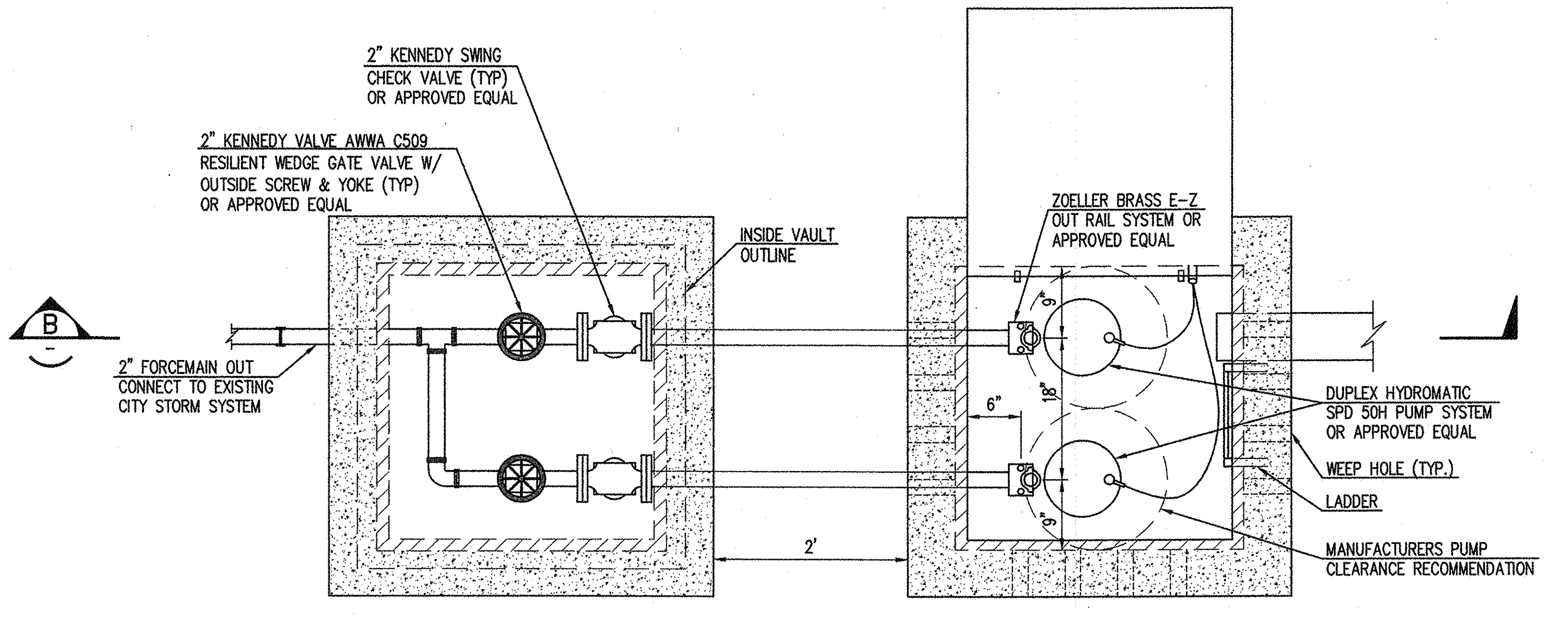
Apr 01, 2009 3:19pm scottm X:\107251-107500\107440 (Ballard Blocks II)\CADD\Design\ON SITE\BBII C1-03 TESC & FD DT.dwg C1-03

NOTES

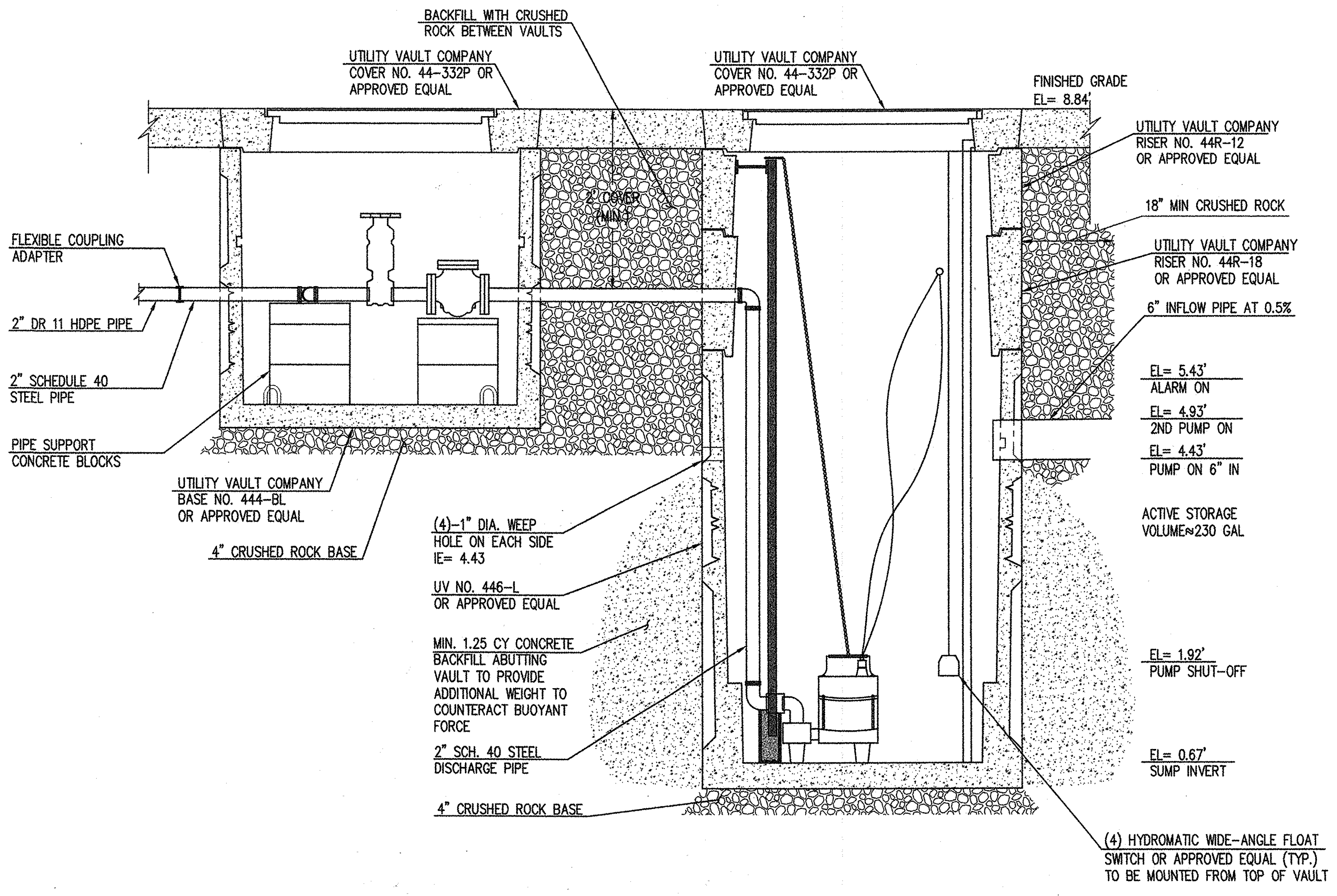
1. SEE SHEET C0-01 FOR ADDITIONAL NOTES, ABBREVIATIONS, AND LEGEND.



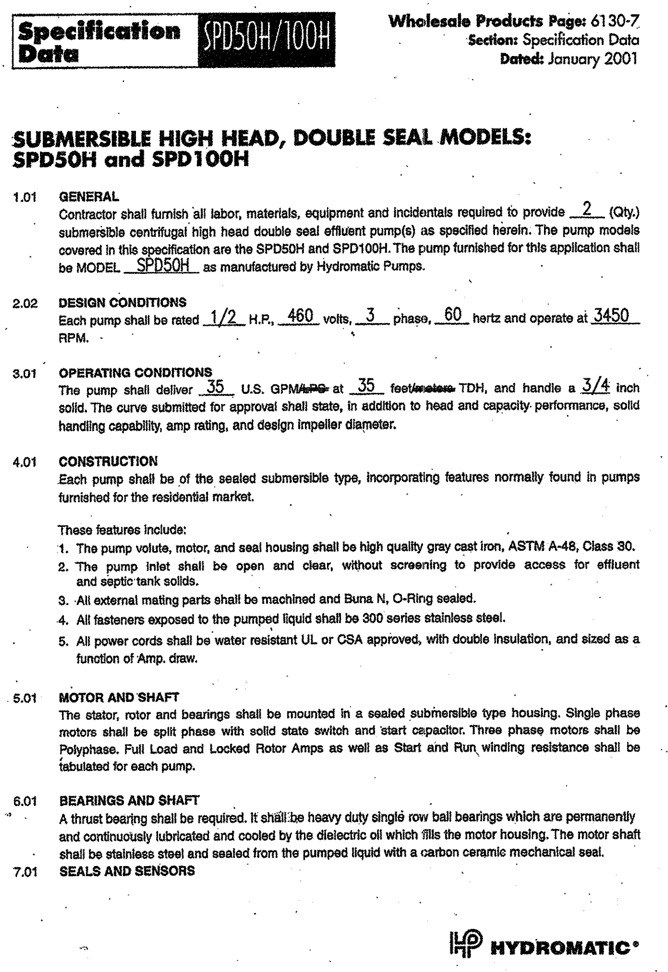
SECTION A / C1-02
1"=2'



FOUNDATION DRAINAGE PUMP STATION DETAIL 1 / C1-02
1"=1'



PUMP STATION SECTION B / –
1"=1'



Specification Data SPD50H/100H

Wholesale Products Page: 6130-7
Section: Specification Data
Dated: January 2001

SUBMERSIBLE HIGH HEAD, DOUBLE SEAL MODELS: SPD50H and SPD100H

1.01 **GENERAL**
Contractor shall furnish all labor, materials, equipment and incidentals required to provide 2 (Qty.) submersible centrifugal high head double seal effluent pump(s) as specified herein. The pump models covered in this specification are the SPD50H and SPD100H. The pump furnished for this application shall be MODEL SPD50H as manufactured by Hydromatic Pumps.

2.02 **DESIGN CONDITIONS**
Each pump shall be rated 1/2 H.P., 460 volts, 3 phase, 60 hertz and operate at 3450 RPM.

3.01 **OPERATING CONDITIONS**
The pump shall deliver 35 U.S. GPM~~/LPS~~ at 35 feet~~/meters~~ TDH, and handle a 3/4 inch solid. The curve submitted for approval shall state, in addition to head and capacity performance, solid handling capability, amp rating, and design impeller diameter.

4.01 **CONSTRUCTION**
Each pump shall be of the sealed submersible type, incorporating features normally found in pumps furnished for the residential market.

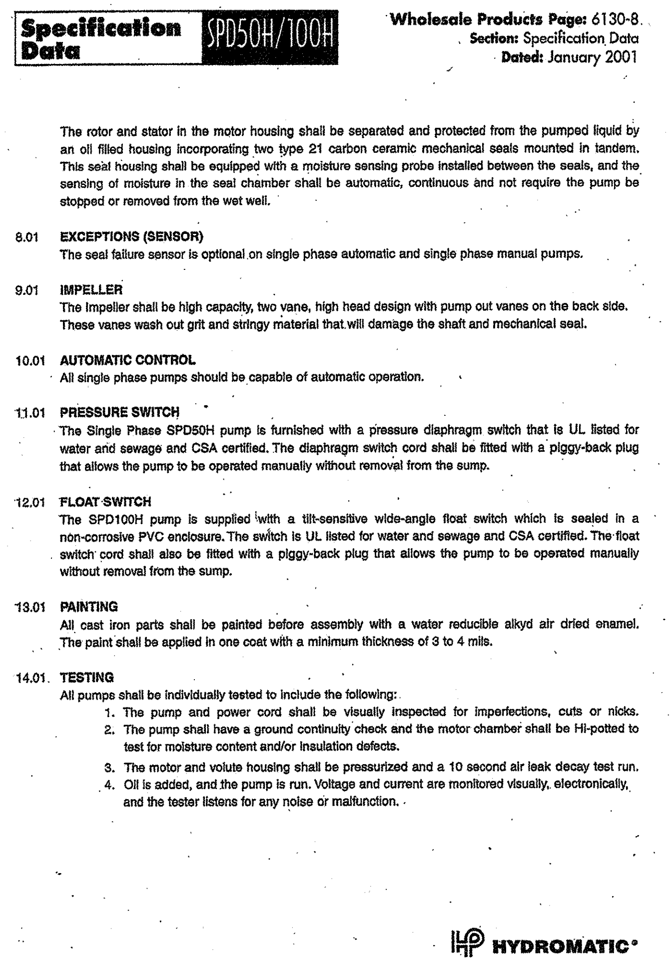
These features include:
1. The pump volute, motor, and seal housing shall be high quality gray cast iron, ASTM A-48, Class 30.
2. The pump inlet shall be open and clear, without screening to provide access for effluent and septic tank solids.
3. All external mating parts shall be machined and Buna N, O-Ring sealed.
4. All fasteners exposed to the pumped liquid shall be 300 series stainless steel.
5. All power cords shall be water resistant UL or CSA approved, with double insulation, and sized as a function of Amp. draw.

5.01 **MOTOR AND SHAFT**
The stator, rotor and bearings shall be mounted in a sealed submersible type housing. Single phase motors shall be split phase with solid state switch and start capacitor. Three phase motors shall be Polyphase. Full Load and Locked Rotor Amps as well as Start and Run winding resistance shall be tabulated for each pump.

6.01 **BEARINGS AND SHAFT**
A thrust bearing shall be required. It shall be heavy duty single row ball bearings which are permanently and continuously lubricated and cooled by the dielectric oil which fills the motor housing. The motor shaft shall be stainless steel and sealed from the pumped liquid with a carbon ceramic mechanical seal.

7.01 **SEALS AND SENSORS**

HYDROMATIC®



Specification Data SPD50H/100H

Wholesale Products Page: 6130-8
Section: Specification Data
Dated: January 2001

The rotor and stator in the motor housing shall be separated and protected from the pumped liquid by an oil filled housing incorporating two type 21 carbon ceramic mechanical seals mounted in tandem. This seal housing shall be equipped with a moisture sensing probe installed between the seals, and the sensing of moisture in the seal chamber shall be automatic, continuous and not require the pump be stopped or removed from the wet well.

8.01 **EXCEPTIONS (SENSOR)**
The seal failure sensor is optional on single phase automatic and single phase manual pumps.

9.01 **IMPELLER**
The impeller shall be high capacity, two vane, high head design with pump out vanes on the back side. These vanes wash out grit and stringy material that will damage the shaft and mechanical seal.

10.01 **AUTOMATIC CONTROL**
All single phase pumps should be capable of automatic operation.

11.01 **PRESSURE SWITCH**
The Single Phase SPD50H pump is furnished with a pressure diaphragm switch that is UL listed for water and sewage and CSA certified. The diaphragm switch cord shall be fitted with a piggy-back plug that allows the pump to be operated manually without removal from the sump.

12.01 **FLOAT SWITCH**
The SPD100H pump is supplied with a tilt-sensitive wide-angle float switch which is sealed in a non-corrosive PVC enclosure. The switch is UL listed for water and sewage and CSA certified. The float switch cord shall also be fitted with a piggy-back plug that allows the pump to be operated manually without removal from the sump.

13.01 **PAINTING**
All cast iron parts shall be painted before assembly with a water reducible alkyd air dried enamel. The paint shall be applied in one coat with a minimum thickness of 3 to 4 mils.

14.01 **TESTING**
All pumps shall be individually tested to include the following:
1. The pump and power cord shall be visually inspected for imperfections, cuts or nicks.
2. The pump shall have a ground continuity check and the motor chamber shall be Hi-potted to test for moisture content and/or insulation defects.
3. The motor and volute housing shall be pressurized and a 10 second air leak decay test run.
4. Oil is added, and the pump is run. Voltage and current are monitored visually, electronically, and the tester listens for any noise or malfunction.

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PUMP SYSTEM SPECIFICATIONS

Apr 01, 2009 3:19pm scottm X:\107251-107500\107440 (Ballard Blocks II)\CADD\Design\ON SITE\BBII C1-03 TESC & FD DT.dwg C1-04

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TITLE: PUMP DETAILS
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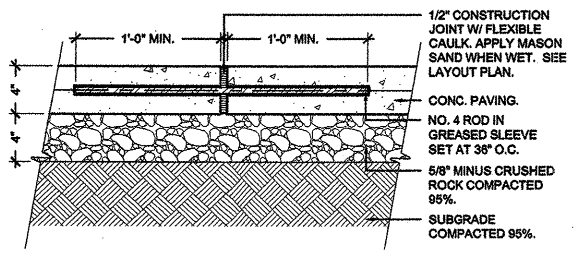
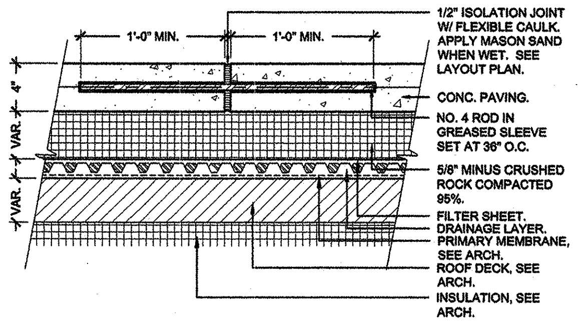
SHEET NO:
C1-04



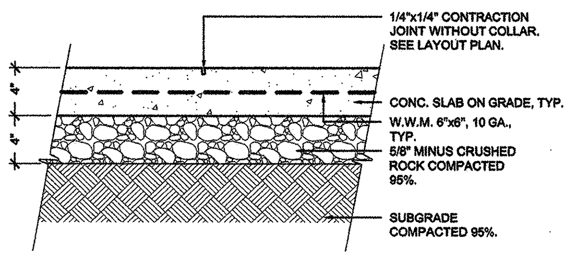
NOTE:
1. TOPPING SLAB TO BE FINISHED WITH A MEDIUM BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW.

1 CONCRETE ISOLATION JOINT ON GRADE
1 1/2" = 1'-0" 32 1313-06



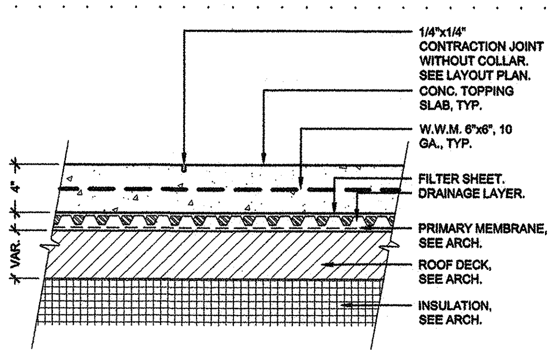
NOTE:
1. TOPPING SLAB TO BE FINISHED WITH A MEDIUM BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW.

2 CONC. ISOLATION JOINT ON STRUC.
1 1/2" = 1'-0" 32 1313.16-10



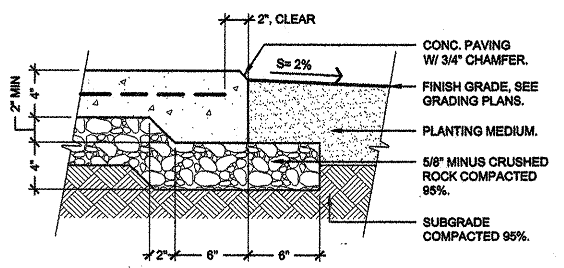
NOTE:
1. TOPPING SLAB TO BE FINISHED WITH A MEDIUM BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW.

3 CONCRETE SLAB ON GRADE
1 1/2" = 1'-0" BB2-07.015-0306



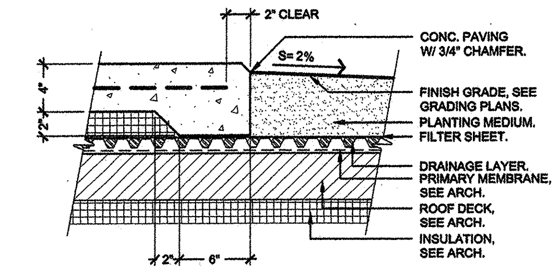
NOTE:
1. TOPPING SLAB TO BE FINISHED WITH A MEDIUM BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW.

4 CONC. TOPPING SLAB ON STRUC.
1 1/2" = 1'-0" BB2-07.015-0305



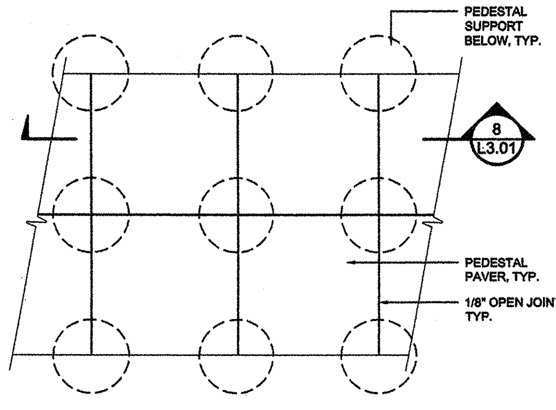
NOTE:
1. CHAMFER SHALL ONLY BE USED IN LOCATIONS WHERE CONCRETE ABUTS PLANTING BEDS, TYP.
2. TOPPING SLAB TO BE FINISHED WITH A MEDIUM BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW.

5 REINFORCED SLAB EDGE ON GRADE
1 1/2" = 1'-0" 32 1313.16-10

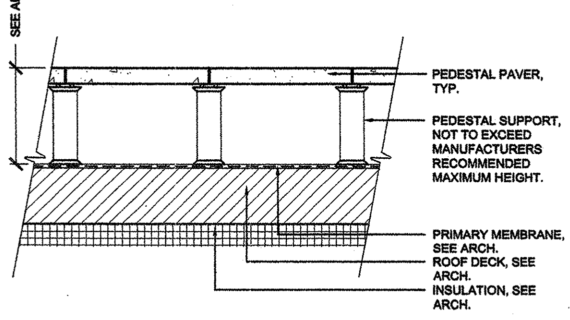


NOTE:
1. CHAMFER SHALL ONLY BE USED IN LOCATIONS WHERE CONCRETE ABUTS PLANTING BEDS, TYP.
2. TOPPING SLAB TO BE FINISHED WITH A MEDIUM BROOM FINISH PERPENDICULAR TO TRAFFIC FLOW.

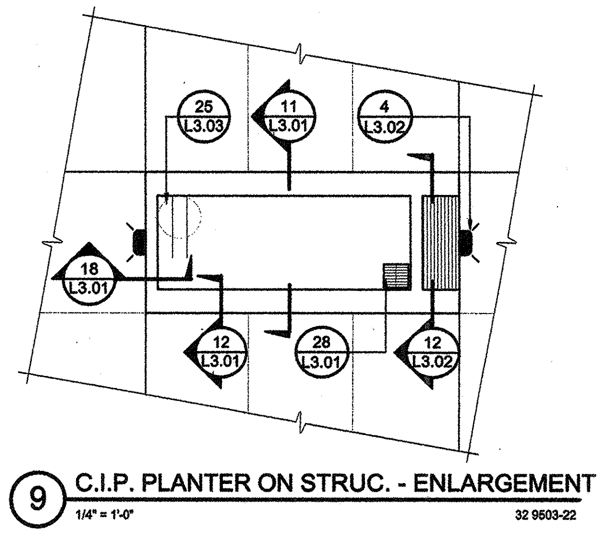
6 REINFORCED SLAB EDGE ON STRUC.
1 1/2" = 1'-0" 32 1313.16-10



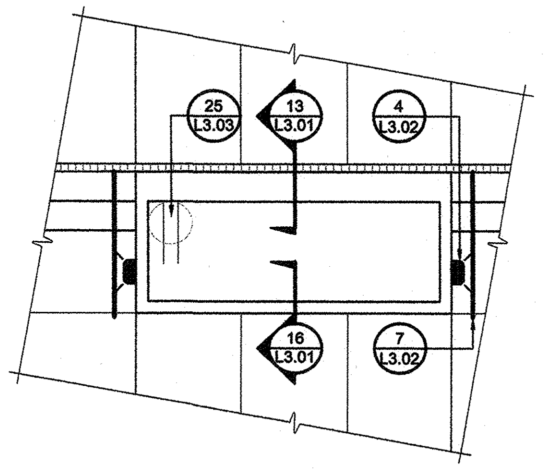
7 PEDESTAL PAVERS
1" = 1'-0" PEDP-GRRF-3212



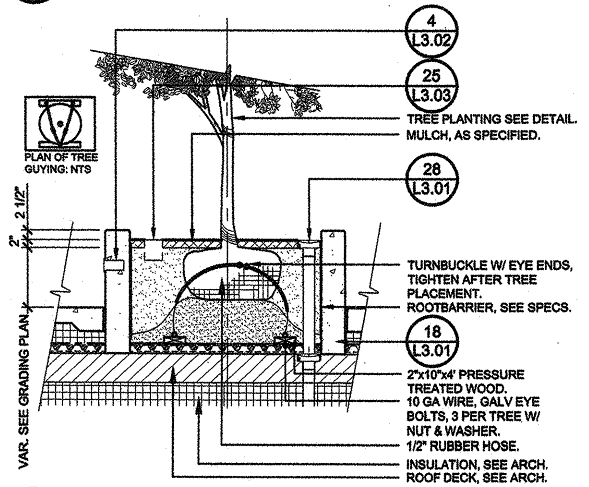
8 PEDESTAL PAVERS - SECTION
1" = 1'-0" BB2-07.015-0306



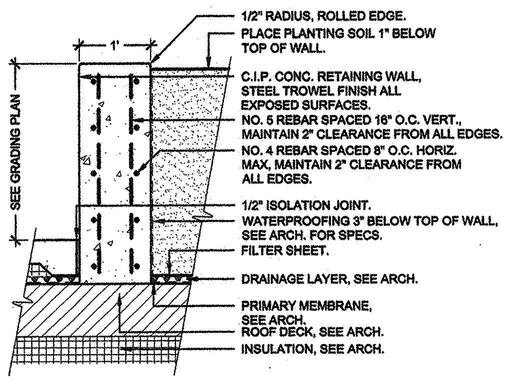
9 C.I.P. PLANTER ON STRUC. - ENLARGEMENT
1/4" = 1'-0" 32 9503-22



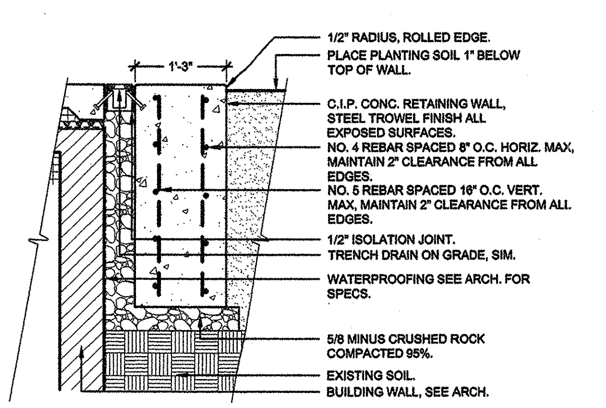
10 C.I.P. PLANTER ON GRADE - ENLARGEMENT
1/4" = 1'-0" 32 9503-22



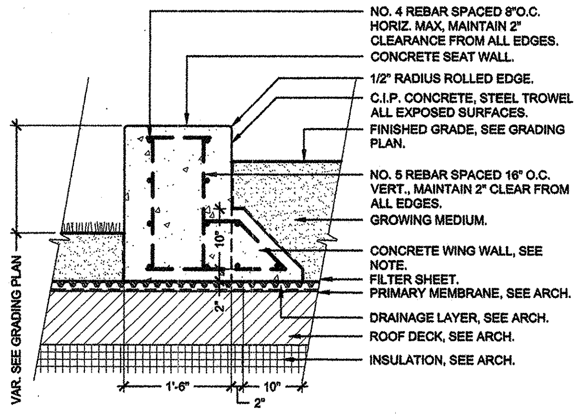
11 DEC. TREE PLANTER W/LIGHT
1/2" = 1'-0" 32 9503-22



12 12" THICK C.I.P PLANTER ON STRUC., TYP.
3/4" = 1'-0" BB2-07.015-0302

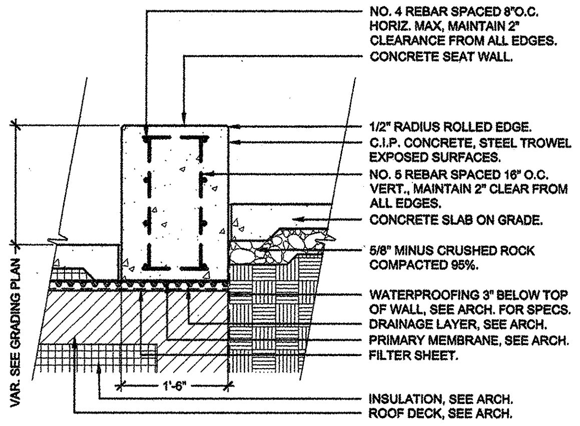


13 15" THICK C.I.P PLANTER ON GRADE
3/4" = 1'-0" 32 9503-22

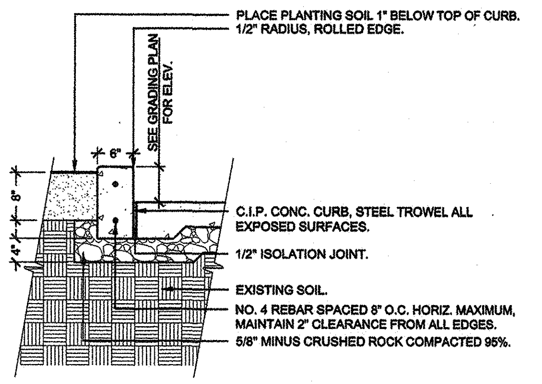


NOTE:
WHEN WALL HEIGHT EXCEEDS 12", INSTALL A 12"x12"x6" REINFORCED WING WALL AT 8' O.C. ON BACK SIDE OF WALL.

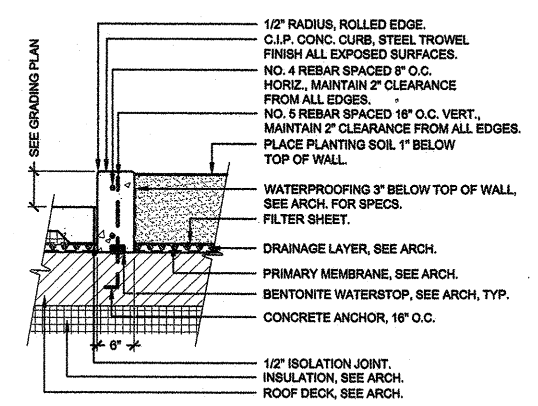
14 C.I.P CONCRETE SEAT WALL
3/4" = 1'-0" BB2-07.015-0303



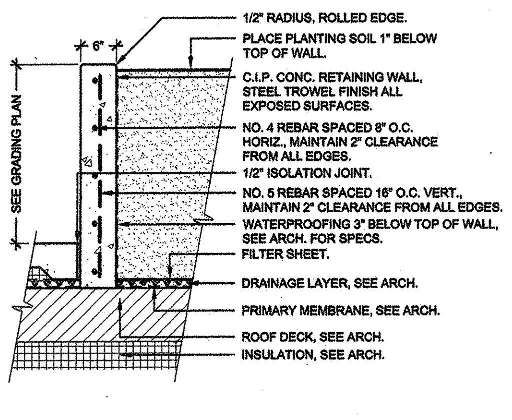
15 C.I.P CONCRETE SEAT WALL - PLAZA.
3/4" = 1'-0" 32 9503-22



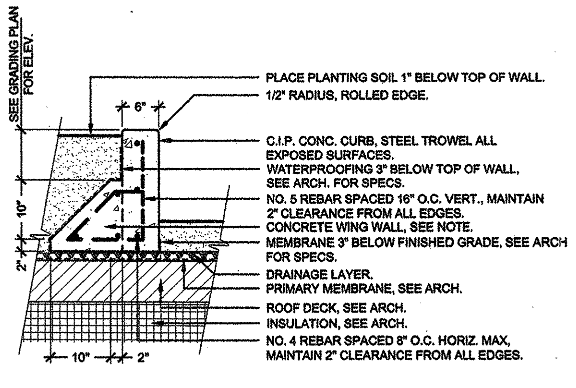
16 6" THICK C.I.P. CURB ON GRADE
3/4" = 1'-0" BB2-07.015-0307



17 6" THICK C.I.P CURB ON STRUC., TYP.
3/4" = 1'-0" 32 9503-22

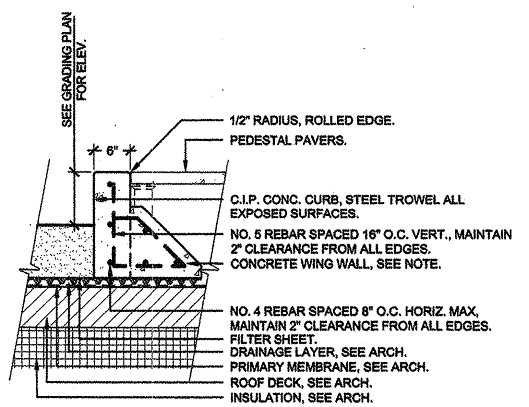


18 6" THICK C.I.P PLANTER ON STRUC., TYP.
3/4" = 1'-0" BB2-07.015-0301



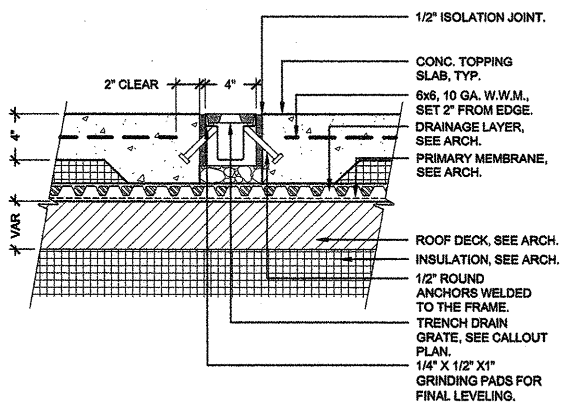
NOTE:
WHEN WALL HEIGHT EXCEEDS 12", INSTALL A 12"x12"x6" REINFORCED WING WALL AT 8' O.C. ON BACK SIDE OF WALL.

19 6" THICK C.I.P CURB ON STRUC.
3/4" = 1'-0" 03 3379.13-03

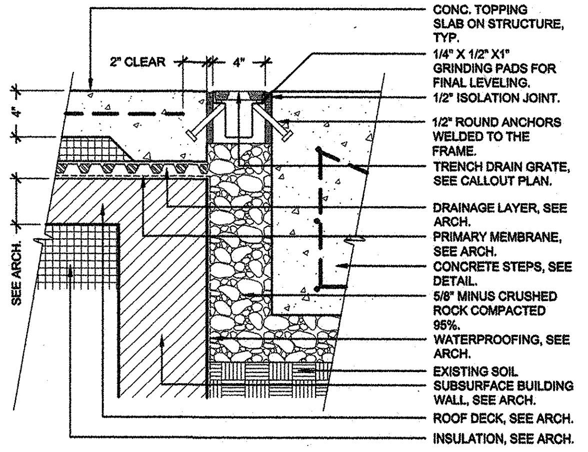


NOTE:
WHEN WALL HEIGHT EXCEEDS 12", INSTALL A 12"x12"x6" REINFORCED WING WALL AT 8' O.C. ON BACK SIDE OF WALL. STAGGER WING WALLS AND PEDESTALS TO AVOID CONFLICTS.

20 6" THICK C.I.P. CURB ADJ. TO PAVERS
3/4" = 1'-0" 03 3379.13-05

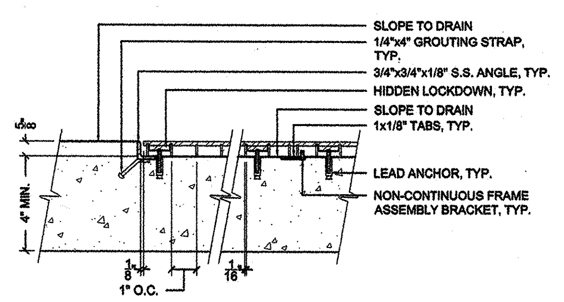


21 TRENCH DRAIN ON STRUCTURE
1 1/2" = 1'-0" BB2-07.015-1202

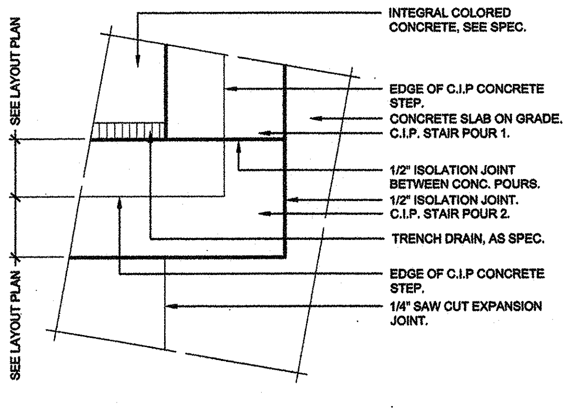


22 TRENCH DRAIN ON GRADE
1 1/2" = 1'-0" BB2-07.015-1201

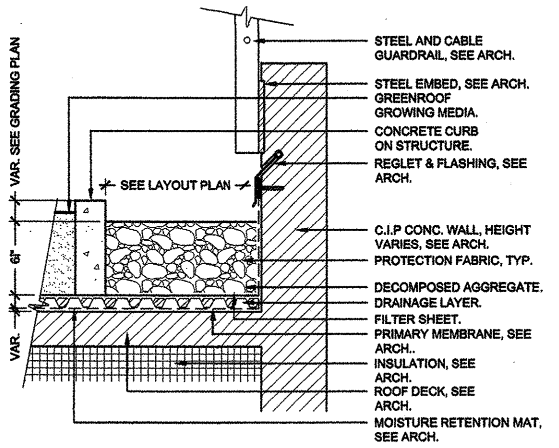
NOTE:
1. INSTALL PER MANUFACTURERS RECOMMENDATIONS.
2. INSTALL AREA DRAIN PER CIVIL PLANS.



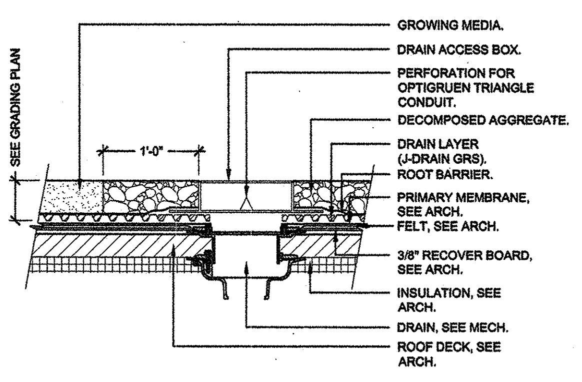
23 WALK OFF GRATE
3" = 1'-0" 32 9503-22



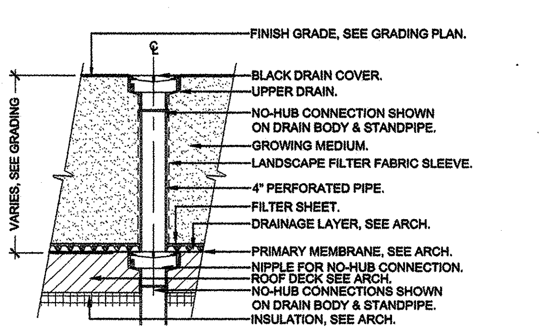
24 CONCRETE STAIRS - ENLARGEMENT
1/2" = 1'-0" BB2-07.015-0308



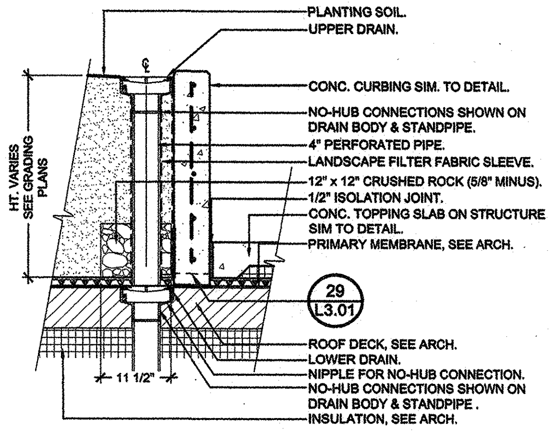
25 GREENROOF ASSEMBLY EDGE
1 1/2" = 1'-0" 32 9503-22



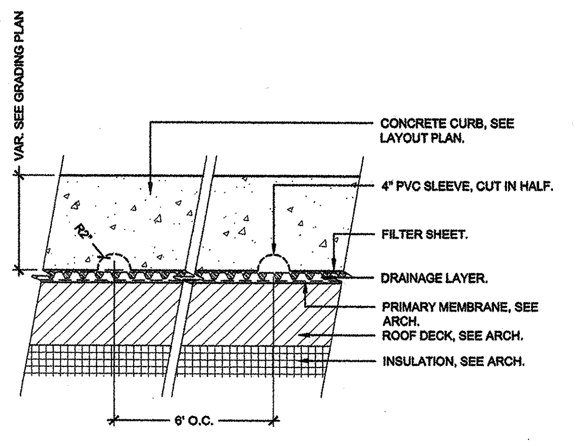
26 GREENROOF ASSEMBLY - DRAIN B
1" = 1'-0" 32 9503-22



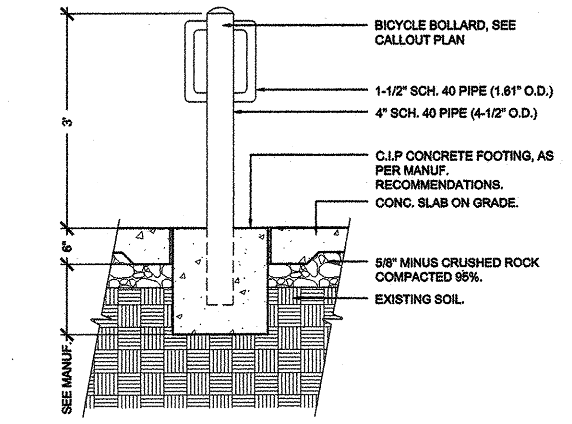
27 DECK DRAIN ON STRUCTURE
3/4" = 1'-0" 32 9503-22



28 DOUBLE DECK DRAIN ON CURB EDGE
3/4" = 1'-0" 32 9503-22



29 CONCRETE WEEP HOLES
1" = 1'-0" 32 9503-22



31 BICYCLE BOLLARD
3/4" = 1'-0" 32 9503-22

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CHK BY:	AMC
DPD NO.	6156775/ 6156774
JOB NO.	07-015
MUP	10/31/07
PERMIT	11/14/07
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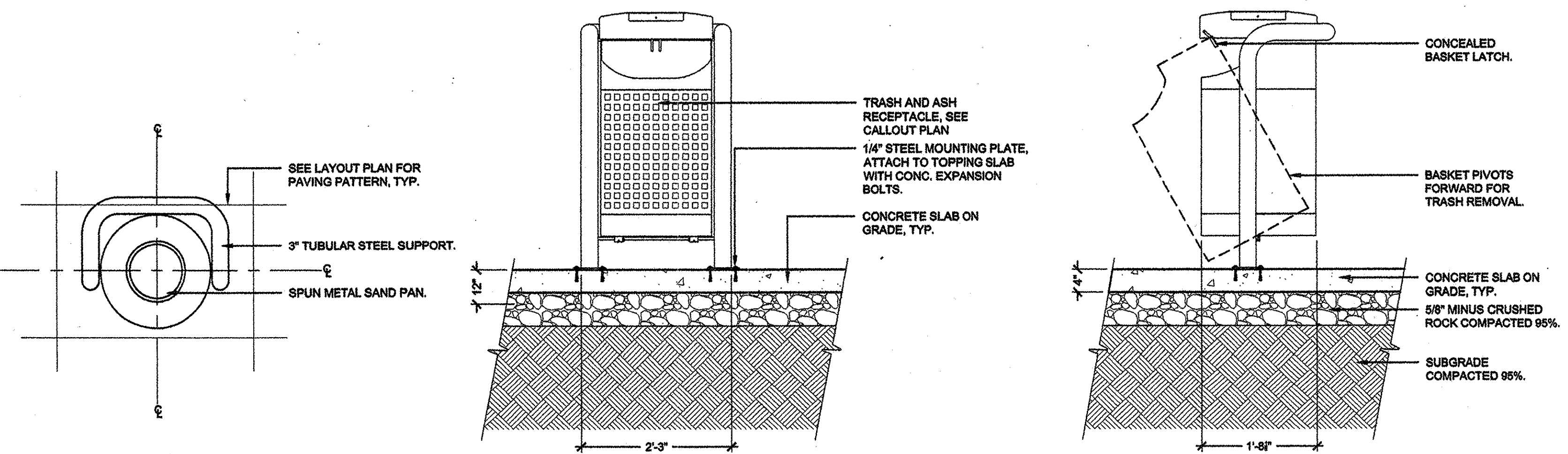
STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
ALAN R. MCWAIN
CERTIFICATE NO. 1036

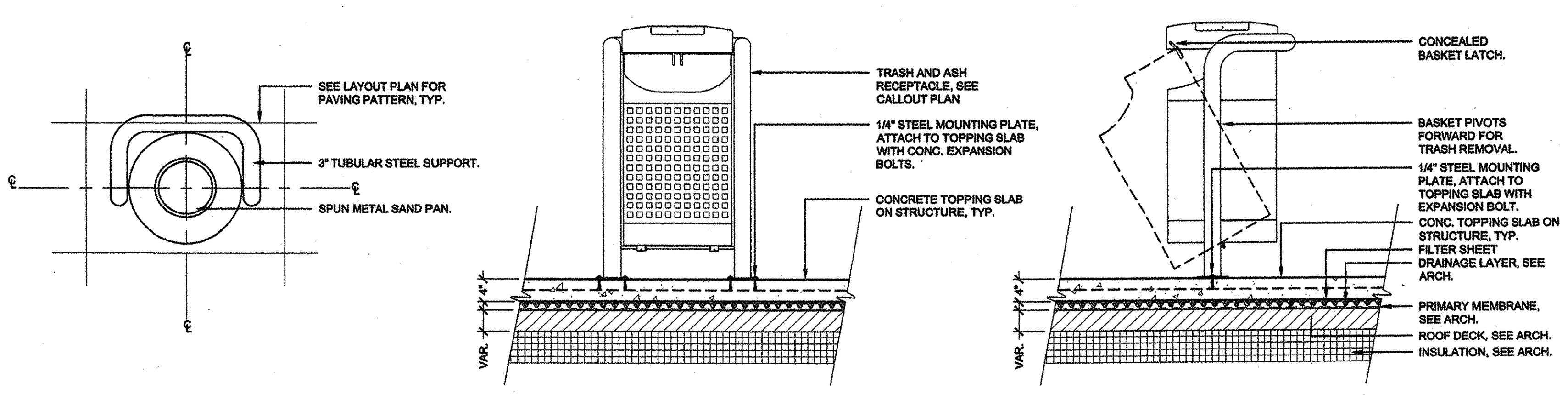
SHEET NO:
L3.01



1 TRASH AND ASH RECEPTACLE

3/4" = 1'-0"

12 9323-03

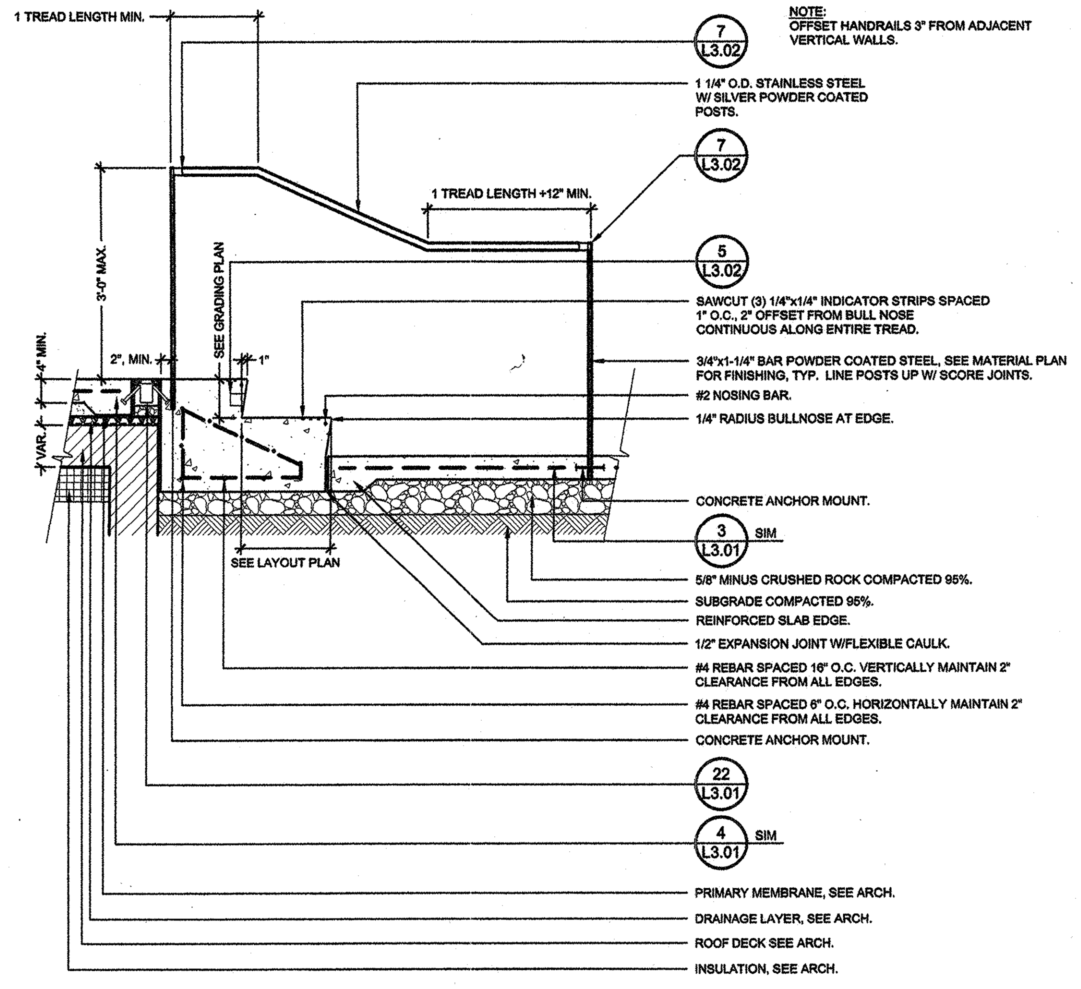


2 TRASH AND ASH RECEPTACLE ON STRUCTURE

3/4" = 1'-0"

12 9323-05

NOTE:
OFFSET HANDRAILS 3" FROM ADJACENT VERTICAL WALLS.

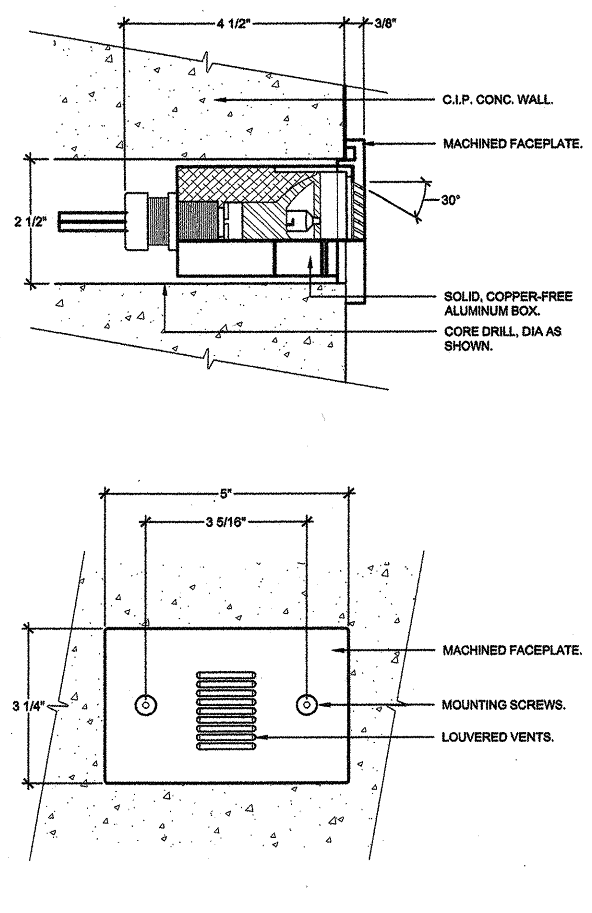


3 CONC. STEPS W/HANDRAIL AND LIGHT

3/4" = 1'-0"

BB2-07.015-3230

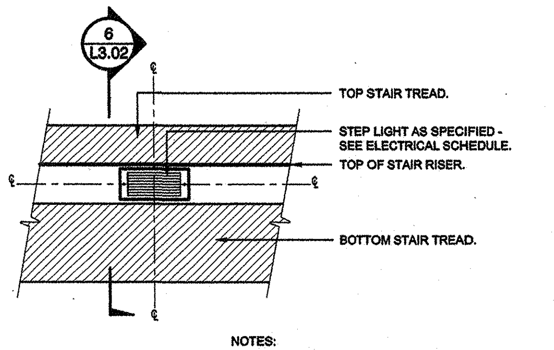
NOTE:
BK LIGHTING, LOUVERED 'BRICK STAR' LIGHT. CORE DRILL CONCRETE WALL AND INSTALL AS PER MANUF. RECOMMENDATIONS.



4 WALL LIGHT

6" = 1'-0"

BB2-07.015-2636

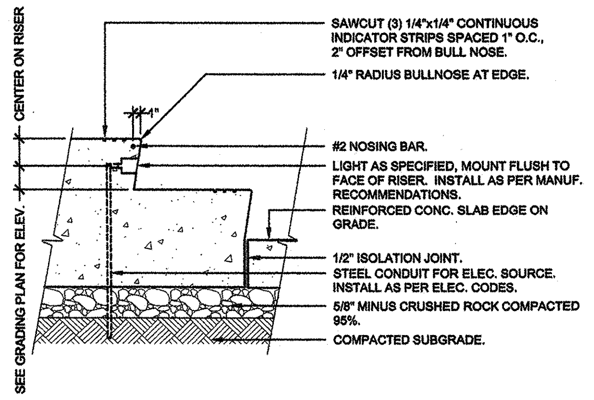


NOTES:
1. PLACE LIGHT CENTERED IN RISER.
2. MOUNT LIGHT FLUSH WITH FACE OF RISER.
3. PLACE LIGHT AT CENTER OF STEPS AS SHOWN.

5 STAIR LIGHT - ELEVATION

1" = 1'-0"

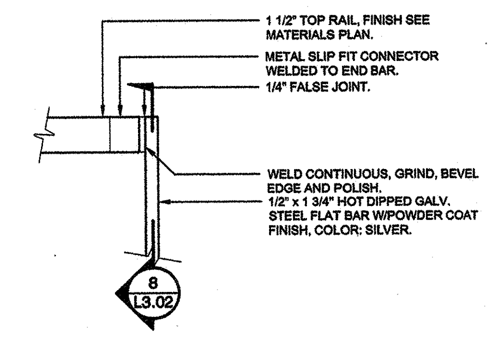
BB2-07.015-2633



6 STAIR LIGHT - SECTION

1" = 1'-0"

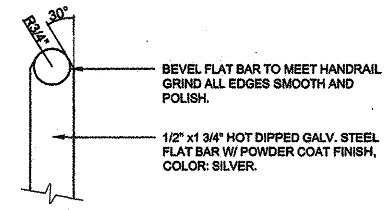
BB2-07.015-2634



7 HANRAIL END SUPPORT

3" = 1'-0"

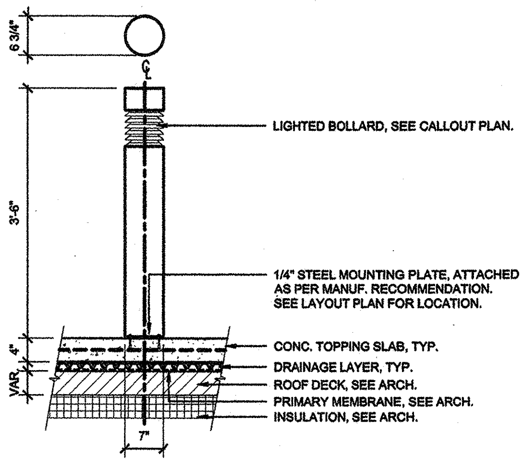
BB2-07.015-3231



8 HANDRAIL END SUPPORT - SECTION

3" = 1'-0"

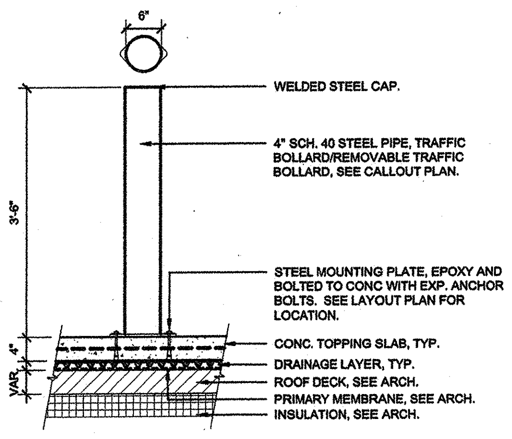
BB2-07.015-3232



9 LIGHTED BOLLARD ON STRUC.

3/4" = 1'-0"

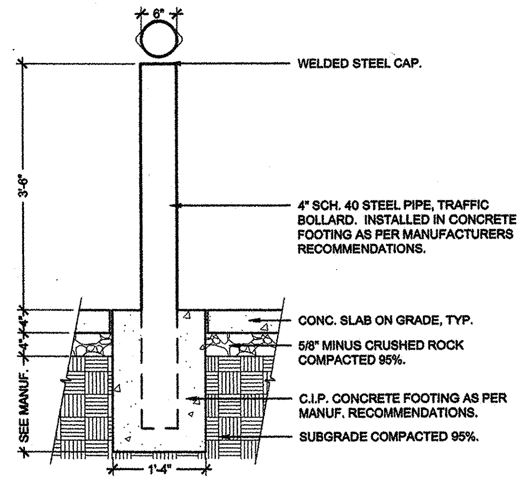
26 5613-15



10 BOLLARD ON STRUCTURE

3/4" = 1'-0"

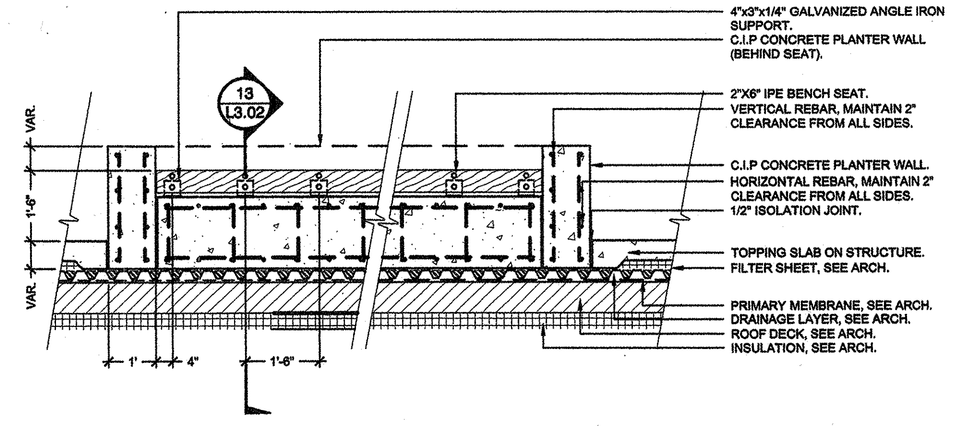
26 5613-09



11 C.I.P. TRAFFIC BOLLARD ON GRADE

3/4" = 1'-0"

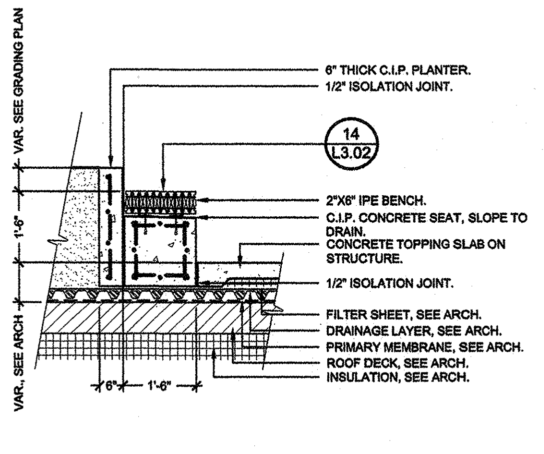
26 5613-09



12 IPE PLANTER BENCH - SECTION

1/2" = 1'-0"

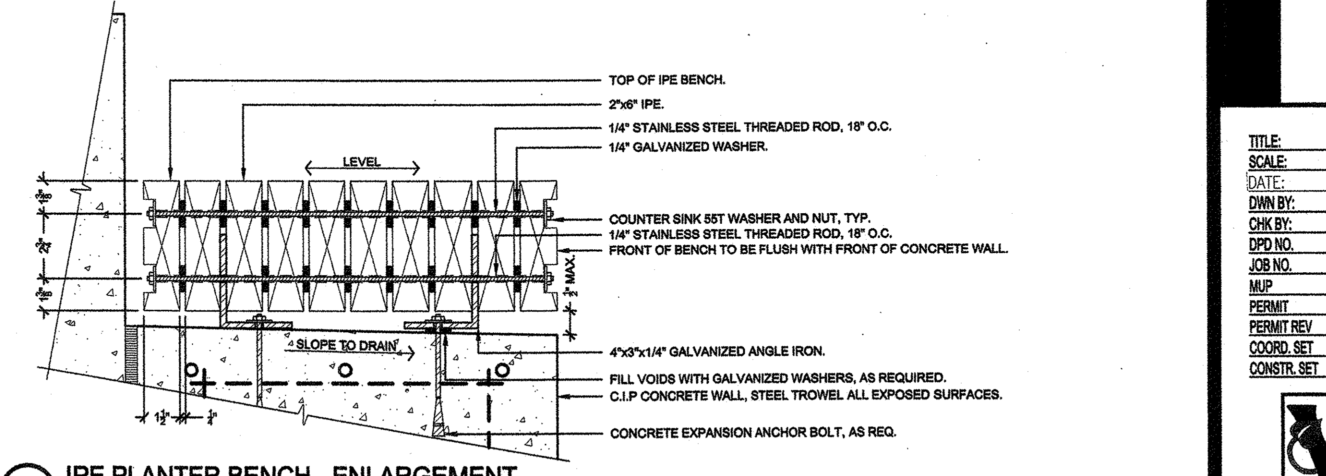
26 5613-09



13 IPE PLANTER BENCH - SECTION

1/2" = 1'-0"

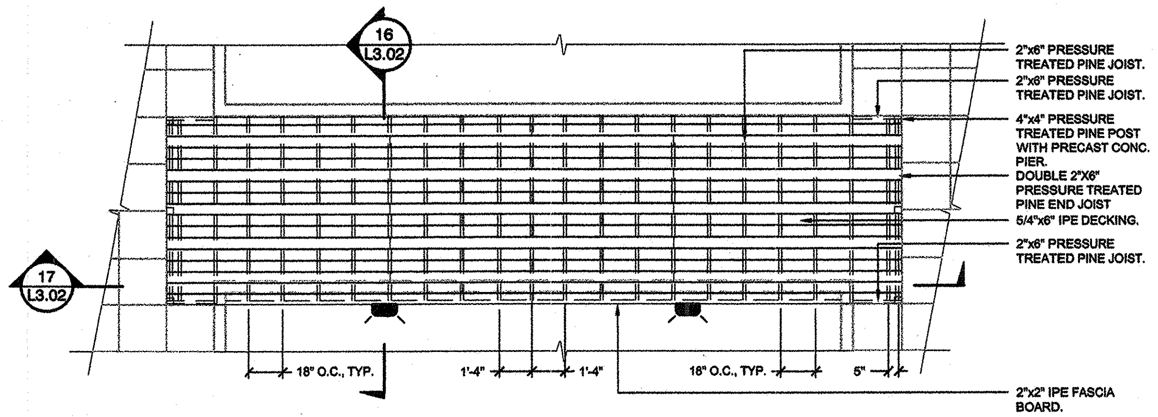
26 5613-09



14 IPE PLANTER BENCH - ENLARGEMENT

3" = 1'-0"

26 5613-09

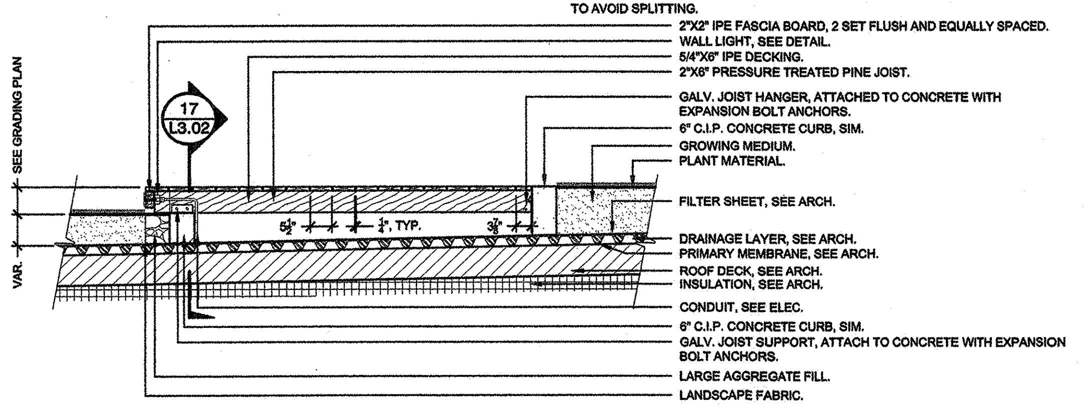


15 IPE WOOD DECK - ENLARGEMENT

1/4" = 1'-0"

26 5613-09

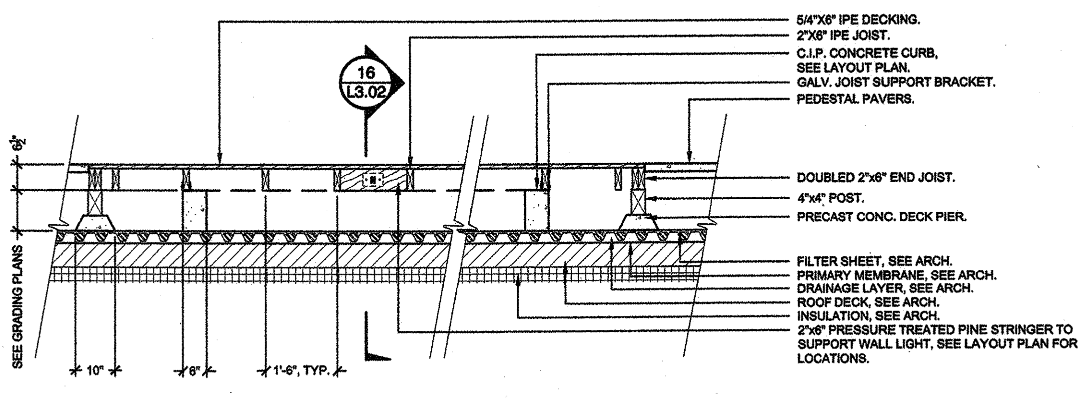
NOTE:
ATTACH ALL WOOD MEMBERS WITH APPROPRIATE LENGTH STAINLESS STEEL TORQUE HEAD SCREWS. COUNTER SINK ALL SCREWS. PRE-DRILL TO AVOID SPLITTING.



16 IPE WOOD DECK - SECTION

1/2" = 1'-0"

26 5613-09



17 IPE WOOD DECK - SECTION

1/2" = 1'-0"

26 5613-09

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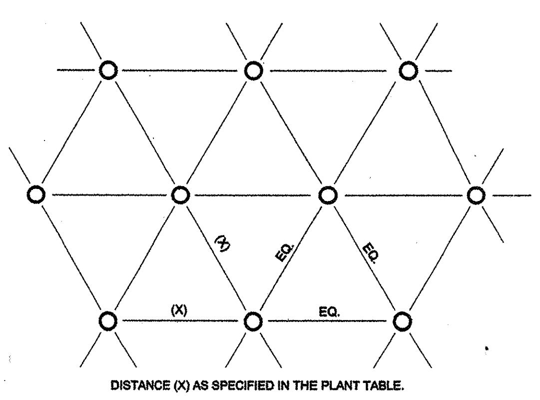
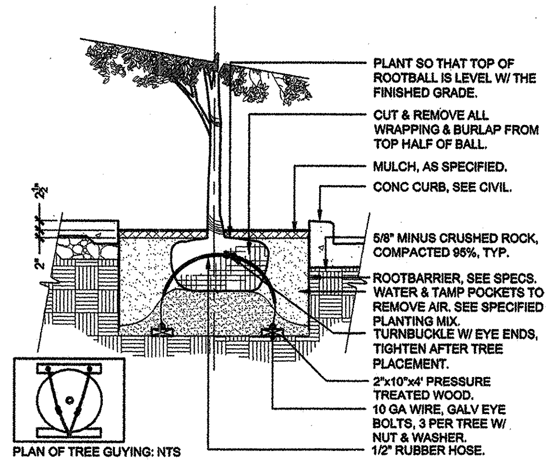
STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
ALAN R. MCWAIN
CERTIFICATE NO. 1036

SHEET NO:

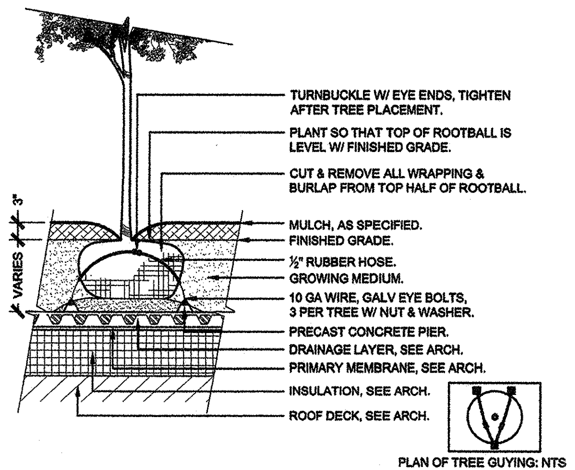
L3.02



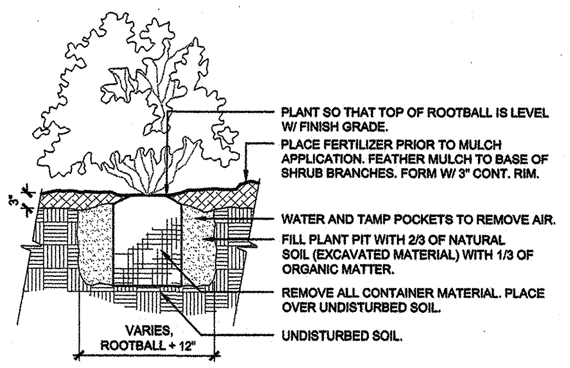
① PLANT SPACING
1" = 1'-0" 32 9333.16-09



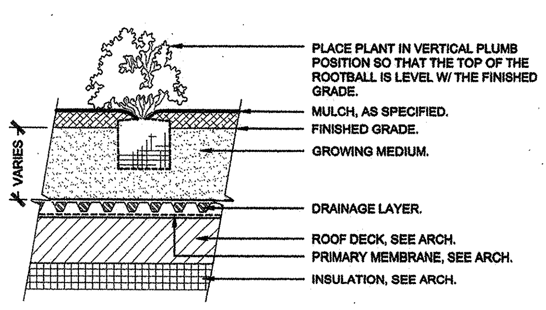
② DECIDUOUS TREE PLANTING PIT
1/2" = 1'-0" 32 9343.59-10



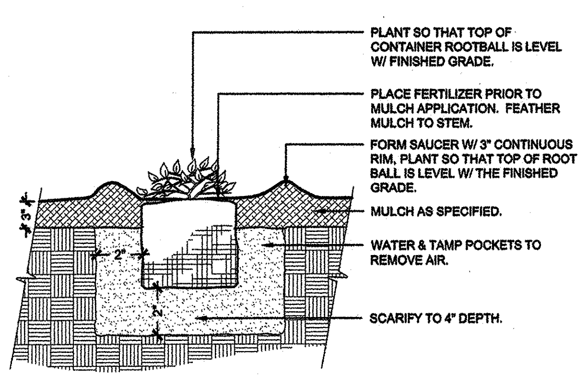
③ TREE PLANTING ON STRUCTURE
3/4" = 1'-0" 32 8409.76-15



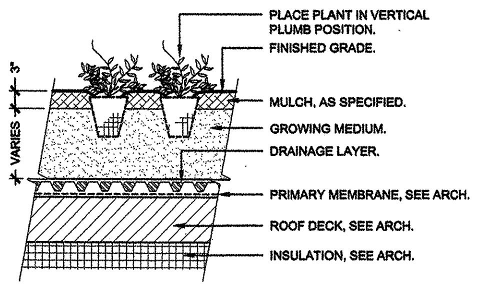
④ SHRUB PLANTING
1 1/2" = 1'-0" 32 9333.13-10



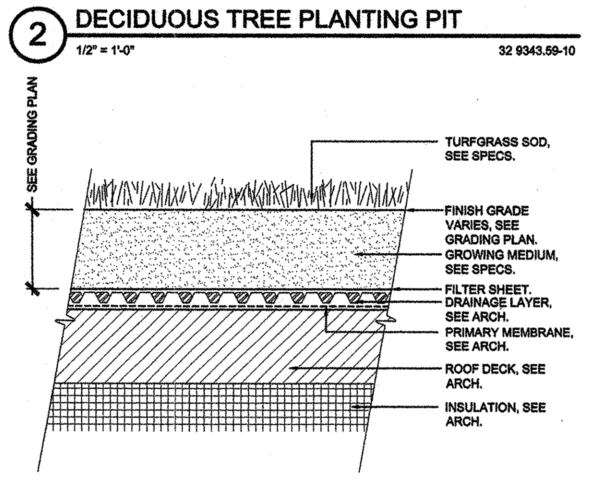
⑤ SHRUB PLANTING ON STRUCTURE
3/4" = 1'-0" 32 9333-09



⑥ GROUND COVER PLANTING
3" = 1'-0" 32 9333-09



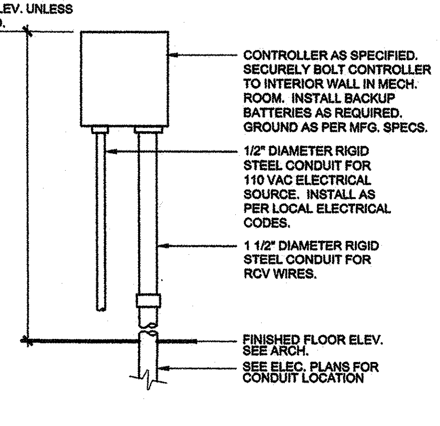
⑦ GROUND COVER ON STRUCTURE
3/4" = 1'-0" 32 9333.93-06



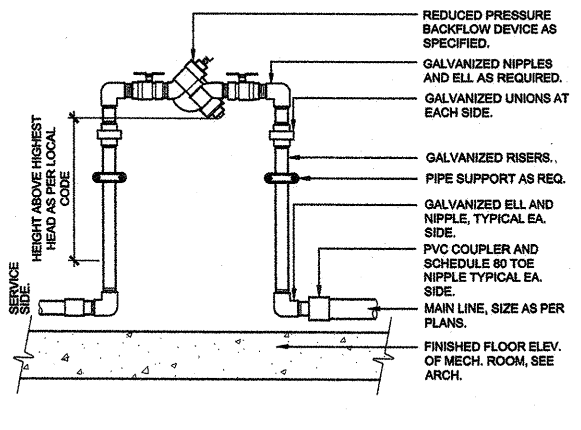
NOTE:
1. GRADE PLANTING AREAS TO A SMOOTH, UNIFORM SURFACE PLANE WITH LOOSE, UNIFORMLY FINE TEXTURE. GRADE TO WITHIN PLUS OR MINUS 1/2 INCH (13 MM) OF FINISH ELEVATION. ROLL AND RAKE, REMOVE RIDGES, AND FILL DEPRESSIONS TO MEET FINISH GRADES.
2. TURFGRASS SPECIES: KENTUCKY BLUEGRASS (POA PRATENSIS), A MINIMUM OF THREE CULTIVARS, WITH NOT LESS THAN 95 PERCENT GERMINATION, NOT LESS THAN 85 PERCENT PURE SEED, AND NOT MORE THAN 0.5 PERCENT WEED SEED.
3. LAY SOD WITHIN 24 HOURS OF HARVESTING. DO NOT LAY SOD IF DORMANT OR IF GROUND IS FROZEN OR MUDDY.
4. LAY SOD TO FORM A SOLID MASS WITH TIGHTLY FITTED JOINTS. BUTT ENDS AND SIDES OF SOD; DO NOT STRETCH OR OVERLAP. STAGGER SOD STRIPS OR PADS TO OFFSET JOINTS IN ADJACENT COURSES.
5. SATURATE SOD WITH FINE WATER SPRAY WITHIN TWO HOURS OF PLANTING. DURING FIRST WEEK AFTER PLANTING, WATER DAILY OR MORE FREQUENTLY AS NECESSARY TO MAINTAIN MOIST SOIL TO A MINIMUM DEPTH OF 1-1/2 INCHES (38 MM) BELOW SOD.
7. MOW TURF AS SOON AS TOP GROWTH IS TALL ENOUGH TO CUT. REPEAT MOWING TO MAINTAIN SPECIFIED HEIGHT WITHOUT CUTTING MORE THAN 1/3 OF GRASS HEIGHT.
8. TURF POST FERTILIZATION: APPLY FERTILIZER AFTER INITIAL MOWING AND WHEN GRASS IS DRY. USE FERTILIZER THAT WILL PROVIDE ACTUAL NITROGEN OF AT LEAST 1 LB/1000 SQ. FT. (0.45 KG/92.9 SQ. M).
9. SATISFACTORY SODDED TURF: AT END OF MAINTENANCE PERIOD, A HEALTHY, WELL-ROOTED, EVEN-COLORED, VIABLE TURF HAS BEEN ESTABLISHED, FREE OF WEEDS, OPEN JOINTS, BARE AREAS, AND SURFACE IRREGULARITIES.
10. USE SPECIFIED MATERIALS TO REESTABLISH TURF THAT DOES NOT COMPLY WITH REQUIREMENTS AND CONTINUE MAINTENANCE UNTIL TURF IS SATISFACTORY.

⑧ TURFGRASS SOD
1" = 1'-0" 32 8409.76-15

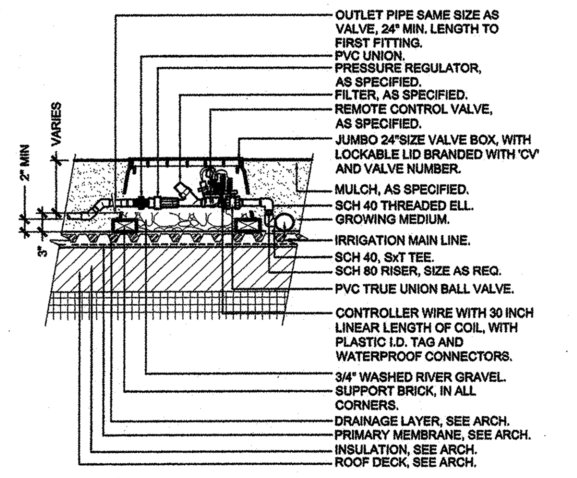
SET CONTROLLER 60" ABOVE FINISHED FLOOR ELEV. UNLESS OTHERWISE NOTED.



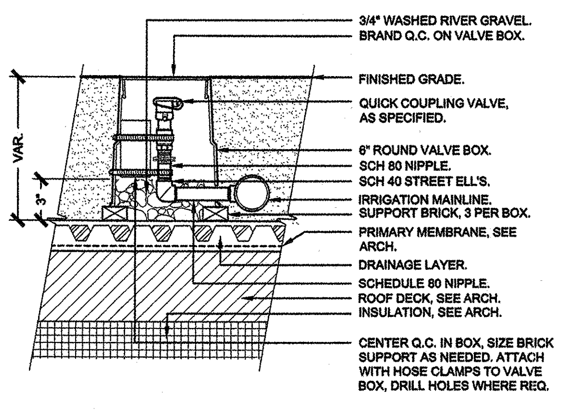
⑨ WALL MOUNT CONTROLLER
1" = 1'-0" 32 9333.93-06



⑩ RP BACKFLOW DEVICE IN MECH. ROOM
1" = 1'-0" 32 9333.93-06

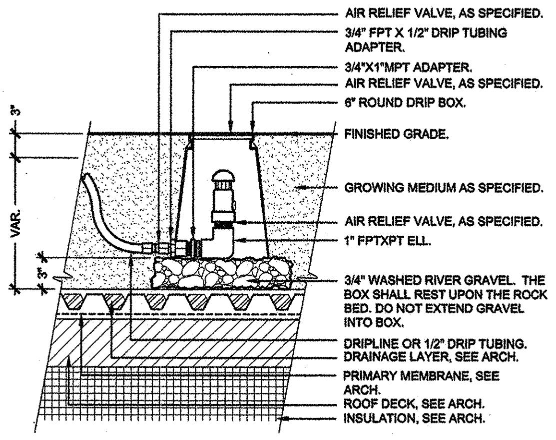


⑪ DRIP CONTROL VALVE KIT ON STRUCTURE
3/4" = 1'-0" 32 8413.76-12

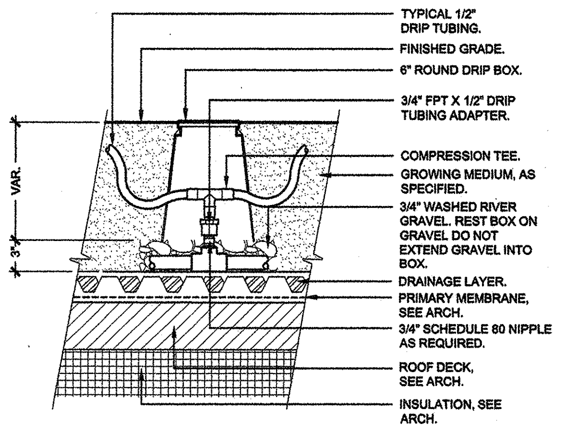


NOTE: FURNISH FITTINGS AND PIPING SIZED IDENTICALLY TO QUICK COUPLING VALVE INLET SIZE

⑫ QUICK COUPLER VALVE ON STRUCTURE
1 1/2" = 1'-0" 32 8409.76-15

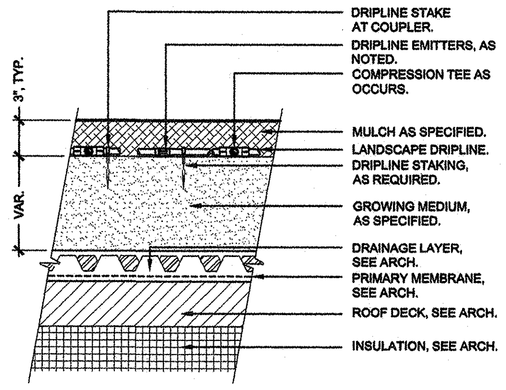


⑬ AIR RELIEF VALVE ON STRUCTURE
1 1/2" = 1'-0" 32 8413.76-12



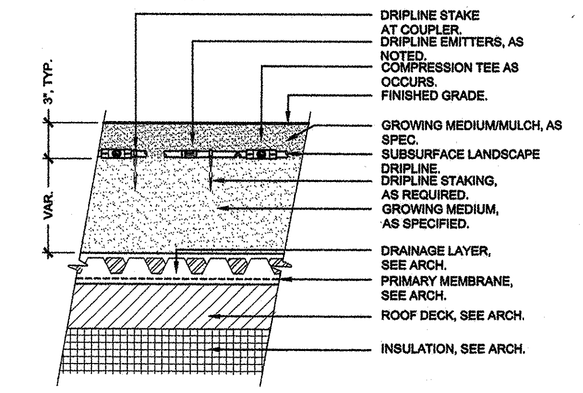
⑭ DRIP ZONE CONTROL ON STRUCTURE
1" = 1'-0" 32 8413.76-12

NOTE:
SEE TYPICAL DRIPLINE LAYOUT REQUIREMENTS FOR LAYOUT AND INSTALLATION INFORMATION.

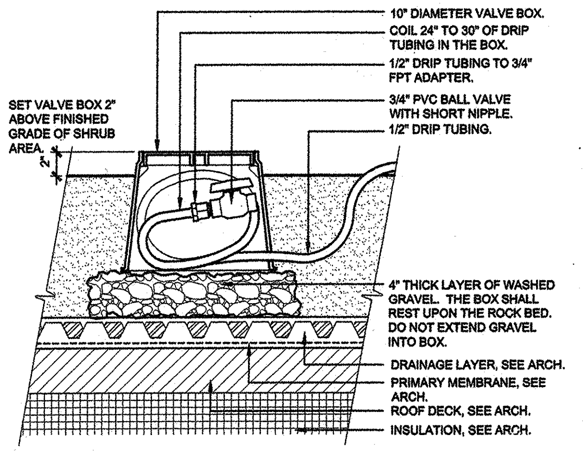


⑮ DRIPLINE ON STRUCTURE
1 1/2" = 1'-0" 32 8409.76-15

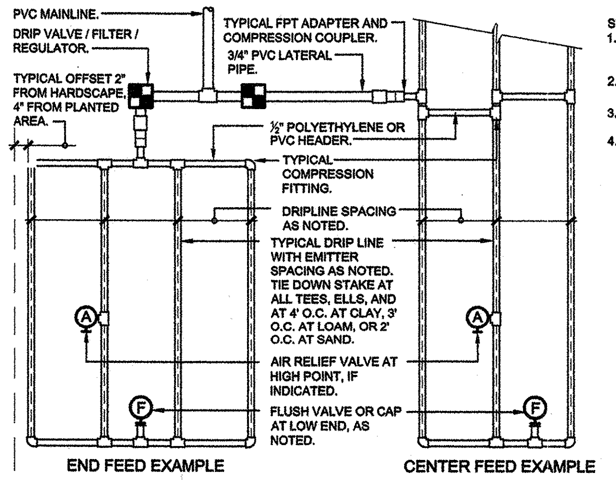
NOTE:
SEE TYPICAL DRIPLINE LAYOUT REQUIREMENTS FOR LAYOUT AND INSTALLATION INFORMATION.



⑯ DRIPLINE ON STRUCTURE
1 1/2" = 1'-0" 32 8413.56-04



⑰ DRIP FLUSH VALVE ON STRUCTURE
1 1/2" = 1'-0" 32 8413.56-04



SLOPED CONDITION NOTE:
1. INSTALL AIR RELIEF VALVE AT HIGHEST POINT.
2. SPACING AS NOTED ON TOP ⅔ OF SLOPE.
3. SPACING AT BOTTOM ⅓ AS NOTED PLUS 25%.
4. WHEN ELEVATION CHANGE IS 10 FT OR MORE, ZONE BOTTOM ⅓ SEPARATELY.

MAXIMUM LATERAL LENGTH (FEET)

PSI	EMITTER FLOW RATE GPH 12" SPACING 0.6	12" SPACING 0.9	18" SPACING 0.6	18" SPACING 0.9	24" SPACING 0.6	24" SPACING 0.9
10	125	96	175	135	218	171
20	249	191	350	171	442	340
30	307	236	434	333	550	422
40	350	268	495	380	627	171
50	125	96	175	135	218	171
60	125	96	175	135	218	171

GRID PRECIPITATION RATES (IN/HR)

EMITTER SPACING	LATERAL SPACING	EMITTER FLOW RATE 0.6	0.9
12	12	0.96	1.44
18	18	0.69	1.03
24	24	0.28	0.41

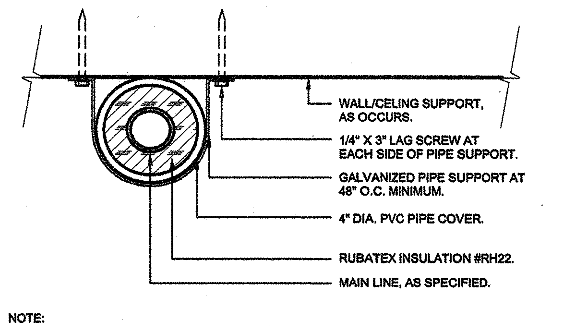
LATERAL FLOW PER 100 FT (GPM)

EMITTER FLOW	12" SPACING	18" SPACING	24" SPACING
0.6 GPH	1.00 GPM	0.67 GPM	0.50 GPM
0.9 GPH	1.50 GPM	1.00 GPM	0.75 GPM

MAXIMUM FLOW PER ZONE

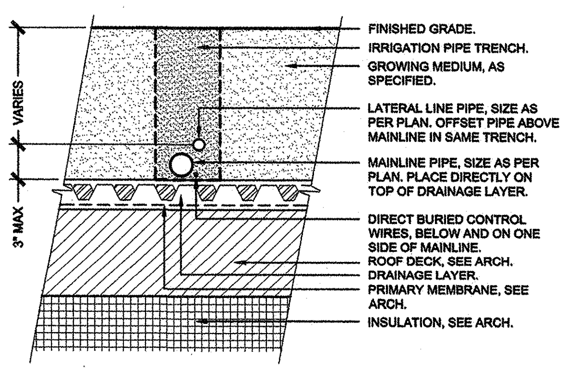
	MAX GPM	PSI LOSS
SCHEDULE 40 PVC HEADER SIZE		
1/2"	4.7 GPM	7.7 PSI
3/4"	8.3 GPM	5.6 PSI
1"	13.5 GPM	4.2 PSI
1-1/2"	33.9 GPM	2.9 PSI
2"	52.4 GPM	1.9 PSI
POLY PIPE HEADER SIZE		
1/2"	4.7 GPM	8.8 PSI
3/4"	8.3 GPM	6.3 PSI
1"	13.5 GPM	4.8 PSI
1-1/2"	31.8 GPM	2.9 PSI
2"	52.4 GPM	2.2 PSI

⑱ TYPICAL DRIPLINE LAYOUT REQUIREMENTS
3" = 1'-0" 32 8413.56-04

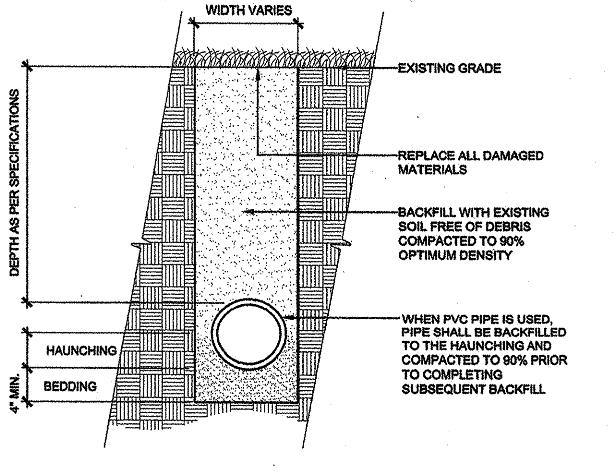


NOTE:
AT ELBOWS, SPLIT THE PVC ELL COVER, ASSEMBLE THE UNIT, AND USE PIPE STRAPS TO INSTALL PVC ELL COVER AROUND MAIN LINE ELL.

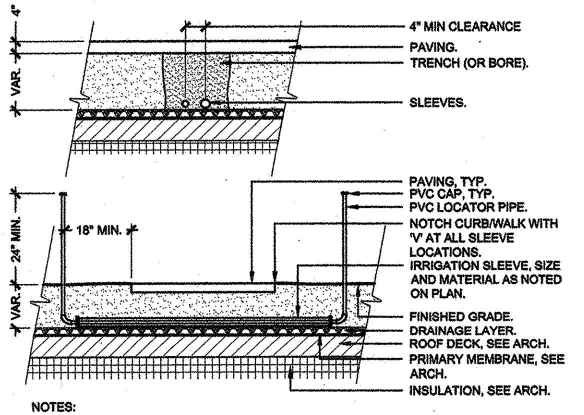
⑲ INS. EX. PIPE SUPPORT IN MECH. RM.
3" = 1'-0" 32 8409.76-15



⑳ PIPE ON STRUCTURE
1 1/2" = 1'-0" 32 8409.76-15

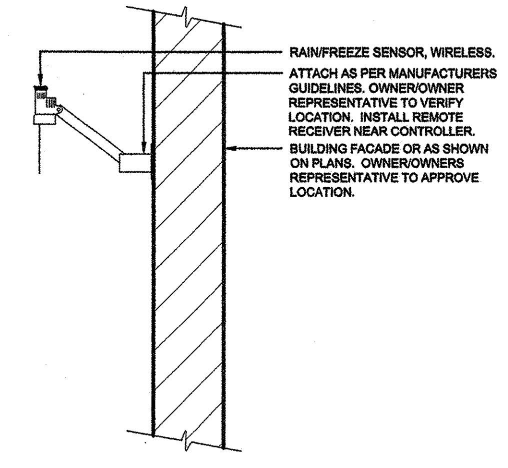


㉑ TRENCH DETAIL
1 1/2" = 1'-0" 32 8409.76-06

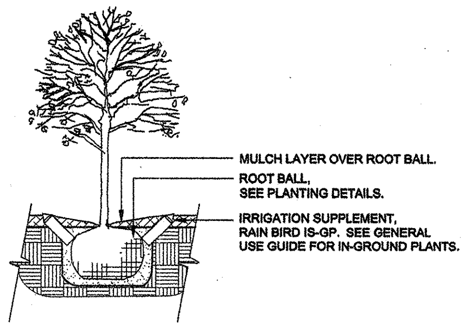


NOTES:
1. ALL IRRIGATION SLEEVES ARE TO BE MATERIAL AND SIZE SPECIFIED ON PLAN.
2. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
3. MECHANICALLY TAMP TO 95% PROCTOR.

㉒ SLEEVING ON STRUCTURE
3/8" = 1'-0" 32 8409.76-15



㉓ RAIN SENSOR
3/4" = 1'-0" 32 8409.76-15

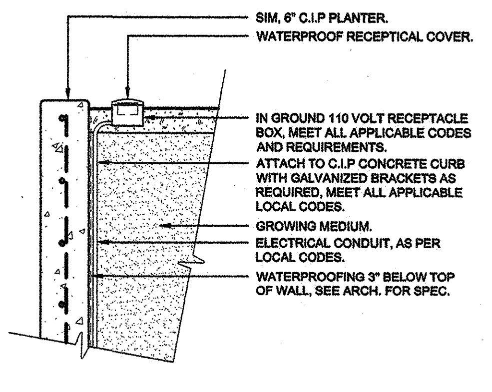


GENERAL USE GUIDE FOR IN-GROUND PLANTS (UNITS PER PLANT)

CONTAINER SIZE	HEIGHT	30-DAY PRODUCT	90-DAY PRODUCT	IN GROUND ADDITIONAL WATERING
1 GALLON	1'-0"	1	1	
	2'-0"	1	2	
5 GALLON	2'-3'	2	4	
	4'-5'	2	5	
10 GALLON	5'-6'	3	5	
	7'-8'	4	7	
24"	8'-9'	4	8	*
	10'-11'	5	12	*
32"	12'-13'	6	14	**
48"	14'-15'	7	15	***
* EVERY 45 DAYS				
** EVERY 30 DAYS				
*** EVERY 21 DAYS				

NOTE:
1. THE RATE AT WHICH PRODUCT LIQUEFIES VARIES BASED ON SEVERAL FACTORS RESULTING IN USAGE LIFE THAT MAY BE SHORTER THAN 30 OR 90 DAYS. USERS ARE ADVISED TO CHECK PRODUCT AT TWO WEEKS PRIOR TO THE SPECIFIED APPLICATION TIME.
2. THE RECOMMENDED NUMBER OF UNITS IS BASED ON AVERAGE NEEDS OF MEDIUM WATER USE PLANT MATERIAL.
3. THE AMOUNT OF UNITS USED CAN BE ADJUSTED FOR EXTREME DRY OR WET CLIMATE CONDITIONS.
4. EXCESSIVE HEAT, WIND AND PLANTS WITH EXTENSIVE FOLIAGE OR FRUIT WILL REQUIRE ADDITIONAL WATERING.

㉔ RAIN BIRD IRRIGATION SUPPLEMENT: IS - GP
6" = 1'-0" 32 8409.76-15



㉕ 110 V RECEPTACLE IN PLANTER
1" = 1'-0" BB2-07.015-2635

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169 Western Avenue W
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1451 / 1401 NW 46TH STREET
SEATTLE, WA 98107

©CDG

TITLE:	SITE DETAILS
SCALE:	SEE DETAILS
DATE:	03/31/09
DWN BY:	AMC, PMC
CHK BY:	AMC
DPD NO.	6156775/ 6156774
JOB NO.	07-015
MUP	10/31/07
PERMIT	11/14/07
PERMIT REV △	05/19/08
COORD. SET	08/01/08
CONSTR. SET	10/15/08

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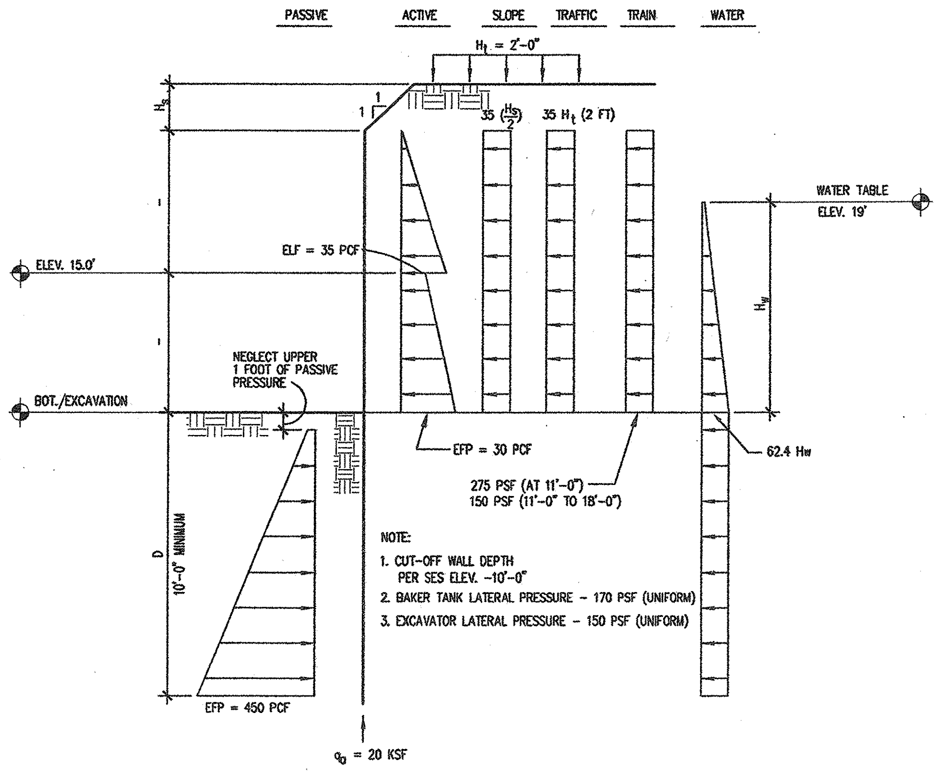
STATE OF WASHINGTON REGISTERED LANDSCAPE ARCHITECT
ALAN R. MCWAIN
CERTIFICATE NO. 1036

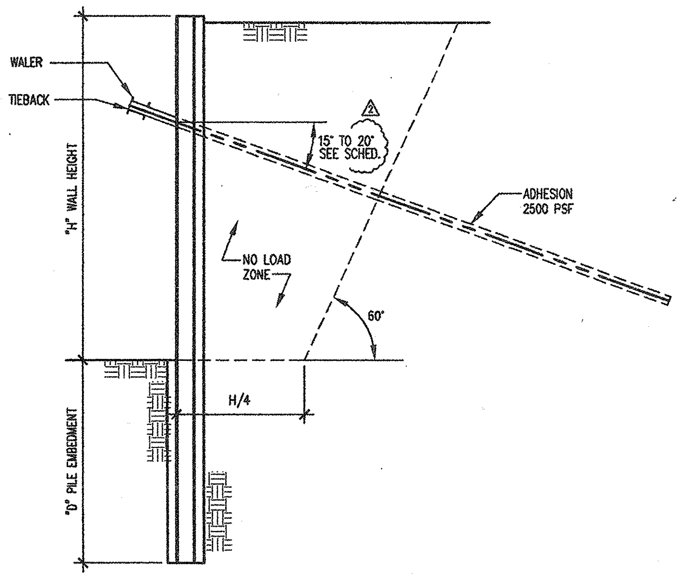
SHEET NO:
L3.03

STRUCTURAL DRAWING SHEET INDEX

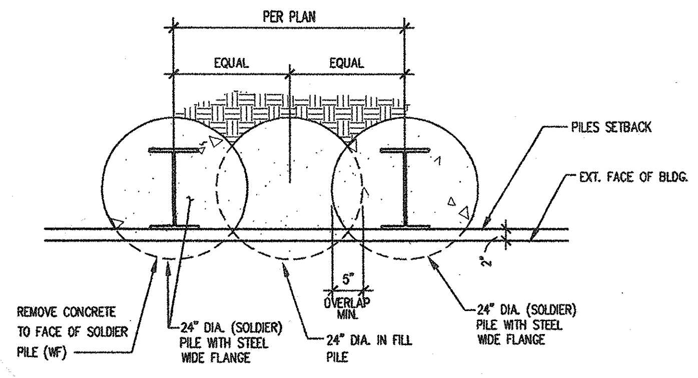


NOTE:
1. CUT-OFF WALL DEPTH PER SES ELEV. -10'-0"
2. BAKER TANK LATERAL PRESSURE - 170 PSF (UNIFORM)
3. EXCAVATOR LATERAL PRESSURE - 150 PSF (UNIFORM)

(SECANT WALL)
1/SS1 LATERAL EARTH PRESSURE
SCALE: NONE



(SECANT WALL)
2/SS1 TIEBACK DIAGRAM
SCALE: 3/16" = 1' - 0"



3/SS1 TYPICAL PILE PLAN
SCALE: 3/4" = 1' - 0"

STRUCTURAL NOTES

CODE REQUIREMENTS

ALL DESIGN & CONSTRUCTION SHALL CONFORM TO THE INTERNATIONAL BUILDING CODE, 2006 EDITION, AS AMENDED BY THE CITY OF SEATTLE.

ALL PILES, CONCRETE & TIMBER LAGGING WITHIN THE RIGHT-OF-WAY SHALL BE REMOVED TO A DEPTH OF 4 FEET BELOW THE FINISH GRADE AFTER COMPLETION OF THE BUILDING CONSTRUCTION.

DESIGN LOADS

DESIGN LOADS FOR THE SHORING DESIGN (TIEBACKED SECANT PILES) ARE AS SPECIFIED BY EARTH SOLUTIONS NW, LLC. IN THE GEOTECHNICAL MEMO DATED JUNE 25, 2008 AND AS INDICATED BELOW. THE SHORING SYSTEM IS TEMPORARY.

CONSTRUCTION VECHILES, EQUIPMENT, AND MATERIAL STORAGE SHALL MAINTAIN A DISTANCE OF AT LEAST FIVE FEET FROM THE TOP OF THE 1H:1V TEMPORARY SLOPES AND SIX FEET FROM THE BACK OF THE SHORING WALL.

TIEBACKS ARE TEMPORARY AND ARE TO BE DE-TENSIONED ONCE THE CONCRETE WALLS AND SLABS ARE COMPLETE AND HAVE REACHED THEIR DESIGN STRENGTH. DETENSIONING TIMING AND SEQUENCING SHALL BE APPROVED BY THE BUILDING STRUCTURAL ENGINEER. (1&2/SS1)

CONCRETE

CONCRETE SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE STANDARD ACI 301 "SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS". CEMENT AND CONCRETE SHALL CONFORM TO ASTM C33, C94, AND C150 & C618. CONCRETE SHALL CONSIST OF A MIXTURE OF CEMENT, POZZOLANIC MATERIAL, FLUIDFIER, AGGREGATE AND WATER PROPORTIONED AND MIXED TO PRODUCE A CONCRETE CAPABLE OF BEING PUMPED AND PLACED.

LEAN MIX CONCRETE	F'c = 1500 PSI FLUID SECANT PILE (1 1/2 SACK PLUS FLY ASH)
STRUCTURAL GROUT	F"c = 3000 PSI (@ 5 DAYS), 9 SACK MIN. PUMPABLE 8" SLUMP

PLACE LEAN MIX CONCRETE FROM BOTTOM OF THE SHAFT TO THE TOP BY UTILIZING A HOLLOW STEM AUGER AND/OR A CONCRETE PUMP TO TREMIE CONCRETE. THE AMOUNT OF CONCRETE DEPOSITED SHALL BE REGULATED AND MEASURED.

STRUCTURAL STEEL

MATERIALS SHALL BE IN ACCORDANCE WITH THE FOLLOWING:

STRUCTURAL STEEL	ASTM A 992 FY = 50 KSI
CHANNEL SHAPES	ASTM A 36 FY =36 KSI
CONNECTION MATERIAL	ASTM A 36 FY = 36 KSI
STRUCTRAL PIPE	ASTM A 501 FY = 36 KSI
STRUCTURAL BOLTS	ASTM A 325-N

DESIGN, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE 13TH EDITION OF THE AISC "STEEL CONSTRUCTION MANUAL AND THE SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS", AISC 360-05.

WELDING

WELDING SHALL CONFORM TO AWS D1-04 "STRUCTURAL WELDING CODE". WELDING ELECTRODES SHALL BE E70XX. ALL WELDING SHALL BE PERFORMED BY WABO AND AWS CERTIFIED WELDERS. ALL COMPLETE PENETRATION WELDS (CP) SHALL BE ULTRASONIC TESTED. ALL FILLET WELDS SHALL BE VISUALLY INSPECTED. MINIMUM WELD SIZE IS ¼" CONTINUOUS FILLET.

UTILITIES & ADJACENT PROPERTIES

STABILITY & EROSION PROTECTION OF EXISTING & CUT SLOPES, AND THE COORDINATION OF THE EXCAVATION, SHORING & OTHER WORK WITH ALL UTILITIES AND ADJACENT PROPERTIES IS THE RESPONSIBILITY OF THE CONTRACTOR. LOCATE & PLUG ALL SIDE SEWERS PRIOR TO DRILLING AND EXCAVATION. LOCATE & DISCONNECT ALL UNDERGROUND POWER & COMMUNICATION LINES PRIOR TO DRILLING & EXCAVATION. CONTRACTOR SHALL VERIFY OVERHEAD CLEARANCES PRIOR TO MOBILIZATION AND CONSTRUCTION.

SOLDIER & INFILL PILES

SOLDIER & INFILL PILES SHALL BE DRILLED WITH A CONTINOUS-FLIGHT HOLLOW STEM AUGER (CFA). SOLDIER PILES ARE TO BE INSTALLED IN 24 INCH DIAMETER PREDRILLED HOLES PER PLAN FILLED WITH LEAN MIX CONCRETE. SOLDIER PILES SHALL BE PLUMB AND TRUE IN THE AUGERED HOLE AND IN A CONTINOUS LINE, AND BRACED AGAINST DISPLACEMENT UNTIL THE CONCRETE HARDENS. IN-FILL PILES ARE TO BE 24 INCH DIAMETER HOLES PER PLAN AND FILLED WITH LEAN MIX CONCRETE. ALL HOLES SHALL BE DRILLED IN AN ACCEPTABLE MANNER WITHOUT LOSS OF GROUND AND WITHOUT ENDANGERING PREVIOUSLY INSTALLED PILES TO THE GEOTECHNICAL ENGINEERS SATISFACTION. (3/SS1)

DEBRIS MAY BE ENCOUNTERED IN THE EXCAVATIONS FOR THE SECANT PILES. CAVING IN THE EXISTING FILL SOIL SHOULD BE EXPECTED, PARTICULARLY WHERE GROUNDWATER IS ENCOUNTERED. CASING OF THE PILE EXCAVATION MAY BE NECESSARY. CFA, TEMPORARY CASING OR OTHER APPROVED METHODS SHALL BE USED AS REQUIRED FOR PILE INSTALLATION TO MINIMIZE GROUND LOSS SHOULD CAVING SOIL CONDITIONS BE ENCOUNTERED. WHEN CASING HOLES ARE REQUIRED, THE CASING SHALL BE OF SUFFICIENT STRENGTH AND RIGIDITY TO WITHSTAND ALL INSTALLATION AND REMOVAL STRESSES, TO PREVENT DISTORTION CASUED BY PLACING ADJACENT PILES AND TO PREVENT COLLAPSE DUE TO SOIL OR HYDROSTATIC PRESSURE.

INITIAL DRILLING TO BE EVERY 4TH INFILL PILE UNTIL GROUND CONDITIONS PERMIT CLOSER DRILL SPACING. ALTERNATE PILE PLACEMENT AT LEAST 24 HOURS TO ALLOW CONCRETE TO HARDENED PRIOR TO DRILLING ADJACENT PILES.

INSTALLATION TOLERANCES ARE AS FOLLOWS:

PLAN DIRECTION	3 INCHES PARALLEL TO WALL
	1 INCH PERPENDICULAR TO WALL
VERTICAL DIRECTION	1 1/2% OF TOTAL LENGTH

ALL PILES, CONCRETE & TIMBER LAGGING WITHIN THE RIGHT-OF-WAY SHALL BE REMOVED TO A DEPTH OF 4 FEET BELOW THE FINISH GRADE AFTER COMPLETION OF THE BUILDING CONSTRUCTION.

SLOPE PROTECTION

THE CONTRACTOR SHALL PROTECT CUT SLOPES WITH PLASTIC IF CONSTRUCTION OCCURS DURING WET WEATHER. PLASTIC SHEETING SHALL BE OVERLAPPED AT LEAST 12 INCHES. SURFACE DRAINAGE AROUND THE EXCAVATION SHALL BE CONTROLLED BY THE CONTRACTOR TO PREVENT WATER FROM FLOWING INTO THE EXCAVATION. CUT SLOPES SHALL BE EXCAVATED TO INTERSECT THE BACKSIDE OF THE DRILLED HOLE.

EXCAVATION

AFTER THE INFILL & SOLDIER PILE INSTALLATION IS COMPLETE AND APPROVED BY THE GEOTECH ENGINEER, EXCAVATION OF THE SITE MAY BEGIN. EXCAVATION SHALL PROCEED TO A DEPTH NO GREATER THAN 2'-0" BELOW THE ELEVATION OF ANY TIEBACK BEFORE STRESSING OF THAT AND ADJOINING TIEBACKS TO THE DESIGN LOAD. AFTER INSTALLATION OF ALL THE TIEBACKS THE EXCAVATION SHALL PROCEED TO A DEPTH NO GREATER THAN SHOWN ON THE PLANS. REMOVE LEAN MIX FROM THE PILE TO ALLOW FOR PLACEMENT OF STRUCTURAL CONCRETE ETC. CARE BY THE EXCAVATOR SHALL BE TAKEN TO PREVENT EXCESSIVE POUNDING OR SHAKING OF THE SECANT WALL.

A DEWATERING SYSTEM SHALL BE INSTALLED AND SHALL BE IN OPERATION PRIOR TO EXCAVATION.

TIMBER LAGGING

TIMBER LAGGING SHALL BE HEM-FIR NO. 2 (4 X 12). TIMBER LAGGING SHALL BE PRESERVATIVE TREATED WITH WATER BORNE PRESERVATIVES IN ACCORDANCE WITH AWPA STANDARD P5. ANY SAWN ENDS OF SUCH TREATED LAGGING SHALL BE FIELD TREATED WITH A TWO BRUSHED COATING OF THE SAME PRESERVATIVE.

TIEBACK TENDONS

POST TENSIONING TENDONS SHALL BE 0.6 INCH DIAMETER, 7 WIRE, LOW RELAXATION STRAND FOR PRESTRESS CONCRETE MANUFACTURED IN ACCORDANCE WITH ASTM A416-99 & FREE FROM CORROSION HAVING A GUARANTEED MINIMUM ULTIMATE TENSILE STRENGTH OF 270 KSI.

NOMINAL DIAMETER	0.6 IN.
MODULUS OF ELASTICITY	28,000 KSI
ULTIMATE STRENGTH(GUTS)	270 KSI (FPU)
MAX. TEMPORARY FORCE	46.9 KIPS (80%)
MAX DESIGN LOAD	35.2 KIPS (60%)

NO TENDON SHALL BE STRESSED AT ANY TIME BEYOND 80% OF THE SPECIFIED MINIMUM TENDON STRENGTH (GUTS). THE LOCK-OFF LOAD (DL) SHALL NOT EXCEED 60% OF THE GUTS OF THE TENDON.

ANCHORAGE DEVICES SHALL BE CAPABLE OF DEVELOPING 95% OF THE MINIMUM SPECIFIED TENSILE STRENGTH(0.95FPU) AND CONFORM TO THE "GUIDE SPECIFICATION FOR POST-TENSIONING MATERIALS", PTI. THE BEARING PLATE SHALL BE INSTALLED PERPENDICULAR TO THE TENDON, 3 DEGREES PLUS OR MINUS AND CENTERED ON THE DRILL HOLE, WITHOUT BENDING OR KINKING OF THE PRESTRESSING STEEL ELEMENTS. WEDGE HOLES AND WEDGES SHALL BE FREE OF RUST, GROUT AND DIRT.

WITHIN THE NO LOAD ZONE TENDONS SHALL BE ENCASED IN SLIPPAGE SHEATHING (BONDBREAKER) OF DURABLE WATERPROOF POLYETHYLENE PLASTIC, 40 MILS MINIMUM THICKNESS, CAPABLE OF PREVENTING THE PENETRATION OF CEMENT PASTE AND SHALL CONTAIN A RUST-INHIBITING GREASE COATING. TEARS IN THE SHEATHING GREATER THAN 4" IN LENGTH SHALL BE REPAIRED PRIOR TO PLACING.

TIEBACK INSTALLATION (GROUND ANCHOR) (6" DIA. ASSUMED)

THE DRILLING, INITIAL GROUT PLACEMENT AND POST GROUTING OF THE DRILLHOLE SHALL DONE BY METHOD APPROVED BY THE GEOTECH ENGINEER. THE INTIAL GROUT PLACEMENT SHALL BE PUMPED OR TREMIED IN ONE CONTINUOUS OPERATION FROM THE BOTTOM OF THE DRILLHOLE. THE QUANTITY OF GROUT PLACED SHALL BE RECORDED. THE DRILLHOLE SHALL BE LOCATED SO THE LONGITUDINAL AXIS OF THE DRILLHOLE AND THE LONGITUDINAL AXIS OF THE TIEBACK TENDON ARE PARALLEL. (7/SS7)

TIEBACKS BELOW THE RAILROAD TRACKS AND WITHIN THE 1H:1V ZONE BENEATH THE BALLARD BRIDGE FOOTINGS SHALL BE DRILLED & INSTALLED USING CASING.

THE GROUTING EQUIPMENT SHALL BE A POSITIVE DISPLACEMENT GROUT PUMP. THE PUMP SHALL BE EQUIPPED WITH A PRESSURE GAUGE AND A STROKE COUNTER. THE QUANTITY OF THE GROUT AND GROUT PRESSURES SHALL BE RECORDED.

NO POST-GROUTING SHALL BE DONE UNDER PRESSURE ABOVE THE BOND LENGTH; THE GROUT AT THE TOP OF THE DRILLHOLE SHALL NOT CONTACT THE BACK OF THE SECANT PILE.

SPACERS SHALL BE USED ALONG THE TIEBACK TENDON BOND LENGTH TO SEPARATE EACH OF THE STRANDS SO THAT THEY WILL BOND TO THE GROUT.

CENTRALIZERS SHALL BE PROVIDED TO ALLOW THE GROUT TO FLOW FREELY AND PROVIDE A MINIMUM OF 2 INCHES OF COVER OVER THE TENDON.

AFTER GROUTING, THE TIEBACK SHALL NOT BE LOADED UNTIL THE GROUT HAS REACHED DESIGN STRENGTH.

TIEBACK ANCHOR TESTING

TIEBACK ANCHORS SHALL BE VERIFICATION TESTED AND PROOF TESTED IN GENERAL ACCORDANCE WITH THE "RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" BY THE POST-TENSIONING INSTITUTE, 2004. TWO VERIFICATION TEST ANCHORS SHALL BE INSTALLED AND TESTED TO CONFIRM ANCHOR ADHESION VALUES PRIOR TO THE COMMENCEMENT OF PRODUCTION ANCHOR INSTALLATION.

THE ALIGNMENT LOAD (AL) SHALL BE THE MINIMUM LOAD REQUIRED TO ALIGN THE TESTING APPRATUS AND SHALL NOT EXCEDD 0.05DL. DIAL GAUGES SHALL BE SET AT ZERO AFTER THE ALIGNMENT LOAS HAS BEEN APPLIED.

DURING THE LOAD HOLD PERIODS, THE ANCHOR LOAD SHALL NOT BE ALLOWED TO DEVIATE FROM THE TEST PRESSURE BY MORE THEN 50 PSI. (RE-PUMPING BACK TO TEST LOAD WILL COMNPENSATE FOR SMALL MOVEMENTS, HYDRAULIC OIL SEEPAGE AND CHANGES IN TEMPERATURE OF THE HYDRAULIC OIL). THE LOAD SHALL ALWAYS BE RETURNED TO THE SPECIFIED TEST LOAD PRIOR TO TAKING THE MOVEMENT READING AT THE SPECIFIED INTERVAL. THE TEST LOAD SHALL NOT BE EXCEEDED DURING THE PERIOD OF OBSERVATION.

NO TENDON SHALL BE STRESSED AT ANY TIME BEYOND 80% OF THE SPECIFIED MINIMUM TENDON STRENGTH (FPU).

VERIFICATION TESTING (PERFORMANCE)

1. THERE SHALL BE AT LEAST TWO VERIFICATION TESTS (200 PERCENT OF THE DESIGN LOAD (DL)) FOR EACH WALL FACE, EACH SOIL TYPE AND EACH INSTALLATION METHOD. THE GEOTECHNICAL ENGINEER MAY REQUIRE THAT ADDITIONAL VERIFICATION TESTS ARE REQUIRED.

2. THE VERIFICATION TEST SHALL BE MADE BY INCREMENTALLY LOADING THE TIEBACK ANCHOR IN 0.25 DESIGN LOAD (DL) INCREMENTS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE;

VERIFICATION TEST LOAD

LOAD	HOLD TIME	LOAD	HOLD TIME
AL	1 MINUTE	1.75 DL	UNTIL STABLE
0.25 DL	10 MINUTES	1.50 DL	UNTIL STABLE
0.50 DL	10 MINUTES	1.25 DL	UNTIL STABLE
0.75 DL	10 MINUTES	1.00 DL	UNTIL STABLE
1.00 DL	10 MINUTES	0.75 DL	UNTIL STABLE
1.25 DL	10 MINUTES	0.50 DL	UNTIL STABLE
1.50 DL	10 MINUTES	0.25 DL	UNTIL STABLE
1.75 DL	10 MINUTES	AL	
2.00 DL	60 MINUTES		
ADJUST & LOCK-OFF			

AT THE TEST LOAD, THE LOAD SHALL BE MAINTAINED CONSTANT FOR 60 MINUTES AND TOTAL MOVEMENT READINGS SHALL BE RECORDED AT 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 40, 50 AND 60 MINUTES AFTER REACHING THE TEST LOAD. THE FOLLOWING CRITERIA SHALL BE MET PRIOR TO ACHOR ACCEPTANCE:

1. MOVEMENT OF A LEAST 80% OF THE CALCULATED ELONGATION OF THE ANCHOR TENDON IN THE NO-LOAD ZONE.

2. MOVEMENT SHALL NOT EXCEED 150% OF THE CALCULATED ELONGATION OF THE ANCHOR TENDON IN THE NO-LOAD ZONE.

3. THE CREEP FOR THE 60 MINUTE HOLD SHALL NOT EXCEED 0.08 INCH PER LOG CYCLE OF TIME AND SHALL BE LINEAR OR DECREASING.

3. ANCHORS SHALL BE LOCKED OFF AT 90 TO 100 PERCENT OF THE DESIGN LOAD. THE ADJUST AND LOCK-OFF SHALL BE DONE AFTER THE UNLOADING THE VERIFICATION TIEBACK AT THE END OF THE TEST.

4. THE VERIFICATION TEST ANCHORS CAN BE USED AS PRODUCTION ANCHORS, PROVIDED THE ANCHOR IS SUCESSFULLY TESTED AND IS ACCEPTABLE.

PROOF TESTING (PRODUCTION ANCHORS)

1. ALL TIEBACK ANCHORS SHALL BE PROOF-TESTED TO AT LEAST 130 PERCENT OF THE DESIGN LOAD (TIEBACK FORCE).

2. THE PROOF TEST SHALL BE MADE BY INCREMENTALLY LOADING THE TIEBACK ANCHOR IN 0.25 DESIGN LOAD (DL) INCREMENTS IN ACCORDANCE WITH THE FOLLOWING SCHEDULE. EACH INCREMENT SHALL BE HELD LONG ENOUGH TO OBTAIN A STABLE READING.

PROOF TEST LOAD

LOAD	HOLD TIME
AL	1 MINUTE
0.25 DL	UNTIL STABLE
0.50 DL	UNTIL STABLE
0.75 DL	UNTIL STABLE
1.00 DL	UNTIL STABLE
1.20 DL	UNTIL STABLE
1.30 DL	10 MINUTES (TEST LOAD)
ADJUST & LOCK-OFF	

EACH INCREMENT SHALL BE HELD LONG ENOUGH TO OBTAIN A STABLE READING.

3. AT THE TEST LOAD, THE LOAD SHALL BE MAINTAINED CONSTANT FOR 10 MINUTES AND TOTAL MOVEMENT READINGS SHALL BE RECORDED AT 1, 2, 3, 4, 5, 6 & 10 MINUTES AFTER REACHING THE TEST LOAD. IF THE TOTAL CREEP MOVEMENT BEWEEEN 1 & 10 MINUTES EXCEEDS (0.040 IN.), THE TEST LOAD SHALL BE MAINTAINED FOR AN ADDITIONAL 50 MINUTES AND THE MOVEMENT READINGS SHALL BE RECORDED AT 20, 30, 40, 50 & 60 MINUTES.

4. ANCHORS SHALL BE LOCKED OFF AT 90 TO 100 PERCENT OF THE DESIGN LOAD.

SUBMITTALS

SUBMITTALS FOR THE FOLLOWING ITEMS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND INSTALLATION;
1. CONSTRUCTION SEQUENCE NARRATIVE & DESCRIPTION INCLUDING EQUIPMENT LIST AND KEY PERSONNEL.
2. TIEBACK ANCHOR TESTING EQUIPMENT, AND HYDRAULIC JACK & PUMP EQUIPMENT
3. LEAN CONCRETE MIX DESIGN
4. CERTIFIED STEEL MILL REPORTS
5. ANCHORAGE DEVICES

INSPECTION

FULL-TIME OBSERVATION BY THE GEOTECHNICAL ENGINEER IS REQUIRED FOR DRILLING OF PILE HOLES, INSTALLATION OF SOLDIER PILES & LEAN MIX CONCRETE, DRILLING OF TIEBACKS, INSTALLATION OF ANCHORS, GROUTING OF TIEBACK, TESTING OF TIEBACK ANCHOR AND TIEBACK LOCK-OFF. A COMPLETE & ACCURATE RECORD SHALL BE KEPT OF ALL PILE DEPTHS, QUANTITY OF LEAN MIX PER PILE, DEPTH OF TIEBACKS, QUASNTITY OF STRUCTRAL GROUT, TIEBACK TESTING RESULTS AND ANY UNUSUAL CONDITIONS ENCOUNTERED.

SPECIAL INSPECTION OF STRUCTURAL GROUT PLACEMENT, FIELD WELDING, & HIGH STRENGTH BOLTING SHALL BE PERFORMED BY A QUALIFIED SPECIAL INSPECTOR.

MONITORING AND QUALITY CONTROL

THE OWNER SHALL PROVIDE FULL TIME OBSERVATION MONITORING OF THE SHORING WALLS, ADJACENT GROUND SURFACES AND BUILDING OR STRUCTURES. A LICENSED SURVEYOR SHALL ESTABLISH BENCHMARKS AT THE DIRECTION OF THE GEOTECHNICAL ENGINEER AND SHALL SURVEY THESE MARKS PRIOR TO COMMENCEMENT OF EXCAVATION. ONCE SOLDIER PILES ARE IN PLACE, ESTABLISH MONITORING POINTS IN THE TOP OF EVERY THIRD PILE. SURVEY THE TOP OF EVERY THIRD SOLDIER PILE (VERTICAL AND HORIZONTAL DISPALCEMENT) TWICE WEEKLY DURING THE SHORING INSTALLATION AND EXCAVATION. A LICENSED SURVEYOR (NOT THE CONTRACTOR) MUST DO THE SURVEYING AT LEAST ONCE A WEEK. ESTABLISH SURVEY LINES NEAR THE TOP OF THE WALL AND AT DISTANCES UP TO THE WALL HEIGHT, H, BEHIND THE WALL FACE. THESE POINTS SHOULD BE SPACED NO MORE THAN 50 FEET APART.

ADDITIONAL SURVEY POINTS MUST BE ESTABLISHE ON THE BALLARD BRIDGE COLUMNS BOTH NEAR THE GROUND SURFACE AND NEAR THE BRIDGE DECK, AND NO MORE THAN 50 FEET APART ON OR NEAR THE EXISTING RAILROAD TRACKS.

SURVEY FREQUENCY CAN BE DECREASED AFTER THE SHORING SYSTEM HAS BEEN INSTALLED AND THE EXCAVATION IS COMPLETE IF THE DATA INDICATES NO OR LITTLE ADDITIONAL MOVEMENT. SURVEYING MUST CONTINUE UNTIL THE PERMANENTD STRUCTURE (INCLUDING FLOOR SLABS AS BRACES) IS COMPLETED UP TO STREET GRADES. THE SURVEY FREQUENCY WOULD BE DETERMINED BY THE GEOTECHNICAL ENGINEER AND REVIEWED BY SDOT AND WOULD BE BASED ON THE SHORING PERFORMANCE.

SUBMIT SURVEY DATA TO THE GEOTECHNICAL ENGINEER, STRUCUTRAL ENGINEER, SHORING DESIGNER, DPD, SDOT STREET USE (SHORING), AND SDOT BRIDGE AND STRUCUTRES (JOHN BUSSELL) EACH WEEK. NOTIFY DPD AND SDOT IMMEDIATELY IF ANY UNUSUAL OR SIGNIFICANTLY INCREASED MOVEMENTS OCCUR.

NOTIFY THE GEOTECHNICAL AND STRUCTURAL ENGINEERS, SHORING DESIGNER, DPD, AND SDOT IF 0.5 INCHES OF MOVEMENT OCCURS BETWEEN TWO CONSECUTIVE READINGS. ALSO NOTIFY THEM WHEN TOTAL MOV EMENTS REACH 0.5 INCHES. AT THAT AMOUNT OF MOVEMENT, THE ENGINEERS AND DESIGNER SHOULD DETERMINE THE CAUSE OF DISPLACEMENT AND DEVELOP REMEDIAL MEASURES IF WARRANTED. TEMEDIAL MEASURES WILL BE IMPLEMENTED IF 1 INCH OF DISPLACEMENT OCCURS.

A VISUAL & PHOTOGRAPHIC SURVEY SHALL BE MADE OF ADJACENT BUILDINGS & PAVEMENT PRIOR TO CONSTRUCTION.

PRE-CONSTRUCTION MEETING

A PRE-CONSTRUCTION MEETING WITH SDOT, SEPARATE FROM ANY DPD MEETING, WILL BE REQUIRED PRIOR TO THE START OF SHORING INSTALLATION. ATTENDEES SHALL INCLUDE REPRESENTATIVES OF THE OWNER, GENERAL CONTRACTOR, EXCAVATION AND SHORING SUBCONTRACTORS, THE GEOTECHNICAL ENGINEER, SURVEYORS, SHORING DESIGNERS, SDOT PERSONNEL, ETC.

LEGEND

S62	SOLDIER PILE NUMBER
3/SS1	
TOP/PILE ELEV. 20'-0"	INDICATES TOP OF PILE ELEVATION
BOT/EXCAVATION ELEV. 6'-10"	INDICATES BOTTOM OF EXCAVATION ELEVATION
WTB1	INDICATES TIEBACK ANCHOR SEE SCHEDULE SS2

**CALL 48 HOURS
BEFORE YOU DIG
1-800-424-5555**

Utility Conflict Note

CAUTION:

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CHARLES T GRIFFES JR
16520
9/24/09

CTE JOB NO. 07228C

1451 / 1401 NW 46TH STREET
SEATTLE, WA 98107

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TITLE: SHORING NOTES
SCALE: AS NOTED
DATE: 10/15/08
DWN BY: JTM
CHK BY: PJH
DPD NO. 6156774
JOB NO. 07228C
PERMIT 11/12/07
PERMIT 05/15/08
PERMIT REV 3 06/30/08
COORD. SET 08/01/08
CONSTR. SET 10/15/08
CONSTR. REV 1 03/31/09

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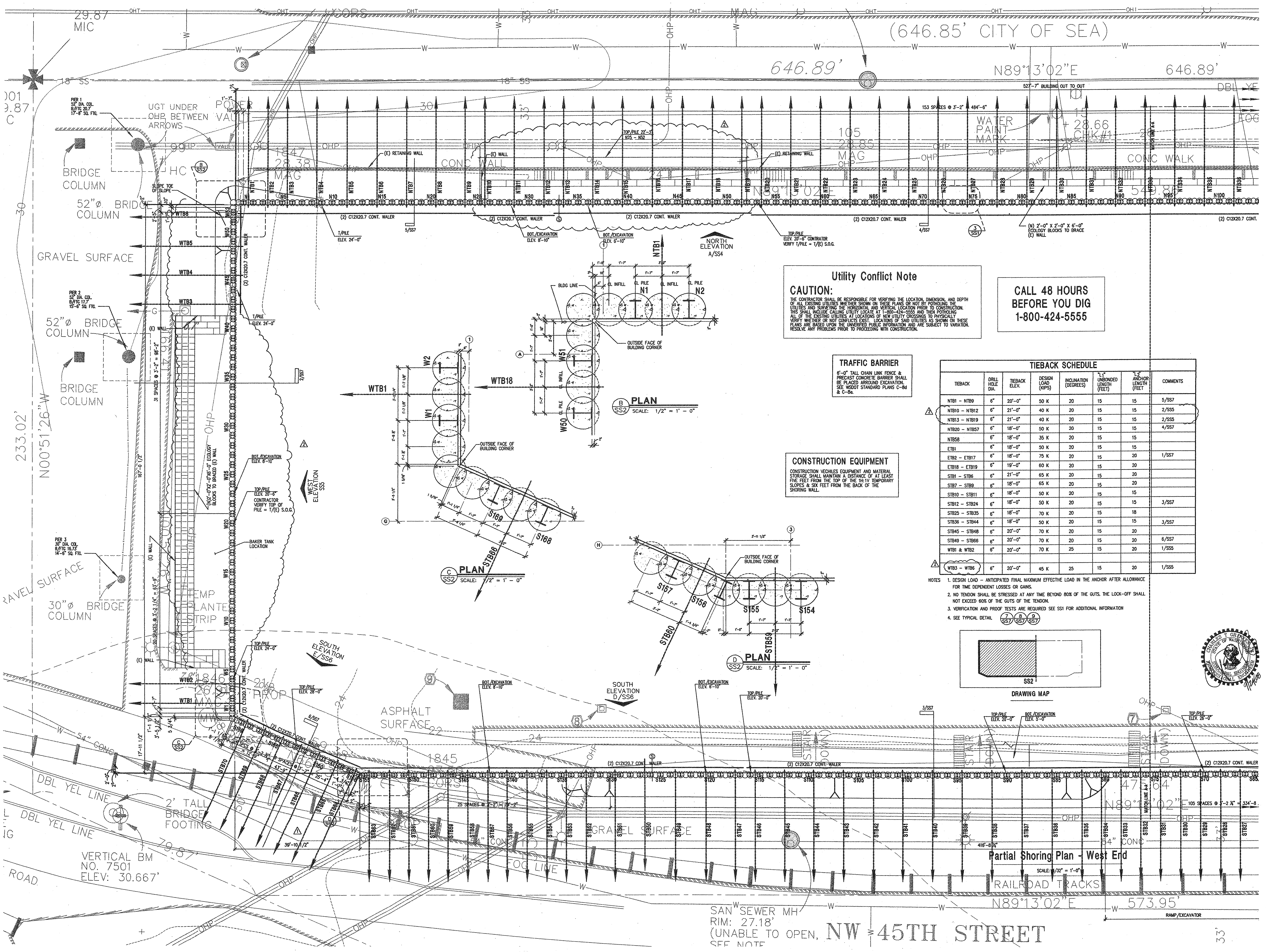
180 Nickerson Street Suite 302
Seattle, WA 98109
206.285.4512 (V) 206.285.0618 (F)

SHEET NO:
SS1



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TRAFFIC BARRIER

6'-0" TALL CHAIN LINK FENCE & PRECAST CONCRETE BARRIER SHALL BE PLACED ARROUND EXCAVATION. SEE WSDOT STANDARD PLANS C-8d & C-8e.

CONSTRUCTION EQUIPMENT

CONSTRUCTION VECHILES EQUIPMENT AND MATERIAL STORAGE SHALL MAINTAIN A DISTANCE OF AT LEAST FIVE FEET FROM THE TOP OF THE 1H:1V TEMPORARY SLOPES & SIX FEET FROM THE BACK OF THE SHORING WALL.

TIEBACK SCHEDULE

TIEBACK	DRILL HOLE DIA.	TIEBACK ELEV.	DESIGN LOAD (KIPS)	INCLINATION (DEGREES)	"L1" UNBONDED LENGTH (FEET)	"L2" ANCHOR LENGTH (FEET	COMMENTS
NTB1 - NTB9	6"	20'-0"	50 K	20	15	15	5/SS7
NTB10 - NTB12	6"	21'-0"	40 K	20	15	15	2/SS5
NTB13 - NTB19	6"	21'-0"	40 K	20	15	15	2/SS5
NTB20 - NTB57	6"	18'-0"	50 K	20	15	15	4/SS7
NTB58	6"	18'-0"	35 K	20	15	15	
ETB1	6"	18'-0"	50 K	20	15	15	
ETB2 - ETB17	6"	18'-0"	75 K	20	15	20	1/SS7
ETB18 - ETB19	6"	19'-0"	60 K	20	15	20	
STB1 - STB6	6"	21'-0"	65 K	20	15	20	
STB7 - STB9	6"	18'-0"	65 K	20	15	20	
STB10 - STB11	6"	18'-0"	50 K	20	15	15	
STB12 - STB24	6"	18'-0"	50 K	20	15	15	3/SS7
STB25 - STB35	6"	18'-0"	70 K	20	15	18	
STB36 - STB44	6"	18'-0"	50 K	20	15	15	3/SS7
STB45 - STB48	6"	20'-0"	70 K	20	15	20	
STB49 - STB66	6"	20'-0"	70 K	20	15	20	6/SS7
WTB1 & WTB2	6"	20'-0"	70 K	25	15	20	1/SS5
WTB3 - WTB6	6"	20'-0"	45 K	25	15	20	1/SS5

NOTES
1. DESIGN LOAD - ANTICIPATED FINAL MAXIMUM EFFECTIVE LOAD IN THE ANCHOR AFTER ALLOWANCE FOR TIME DEPENDENT LOSSES OR GAINS.
2. NO TENDON SHALL BE STRESSED AT ANY TIME BEYOND 80% OF THE GUTS. THE LOCK-OFF SHALL NOT EXCEED 60% OF THE GUTS OF THE TENDON.
3. VERIFICATION AND PROOF TESTS ARE REQUIRED SEE SS1 FOR ADDITIONAL INFORMATION
4. SEE TYPICAL DETAIL 7/SS7 8/SS7 9/SS7

1451 / 1401 NW 46TH STREET
SEATTLE, WA 98107

TITLE: SHORING PLAN (WEST)
SCALE: AS NOTED
DATE: 10/15/08
DWN BY: JTM
CHK BY: PJH
DPD NO. 6156774
JOB NO. 07228C
PERMIT 11/12/07
PERMIT 05/15/08
PERMIT REV 3 06/30/08
COORD. SET 08/01/08
CONSTR. SET 10/15/08
CONSTR. REV 1 03/31/09

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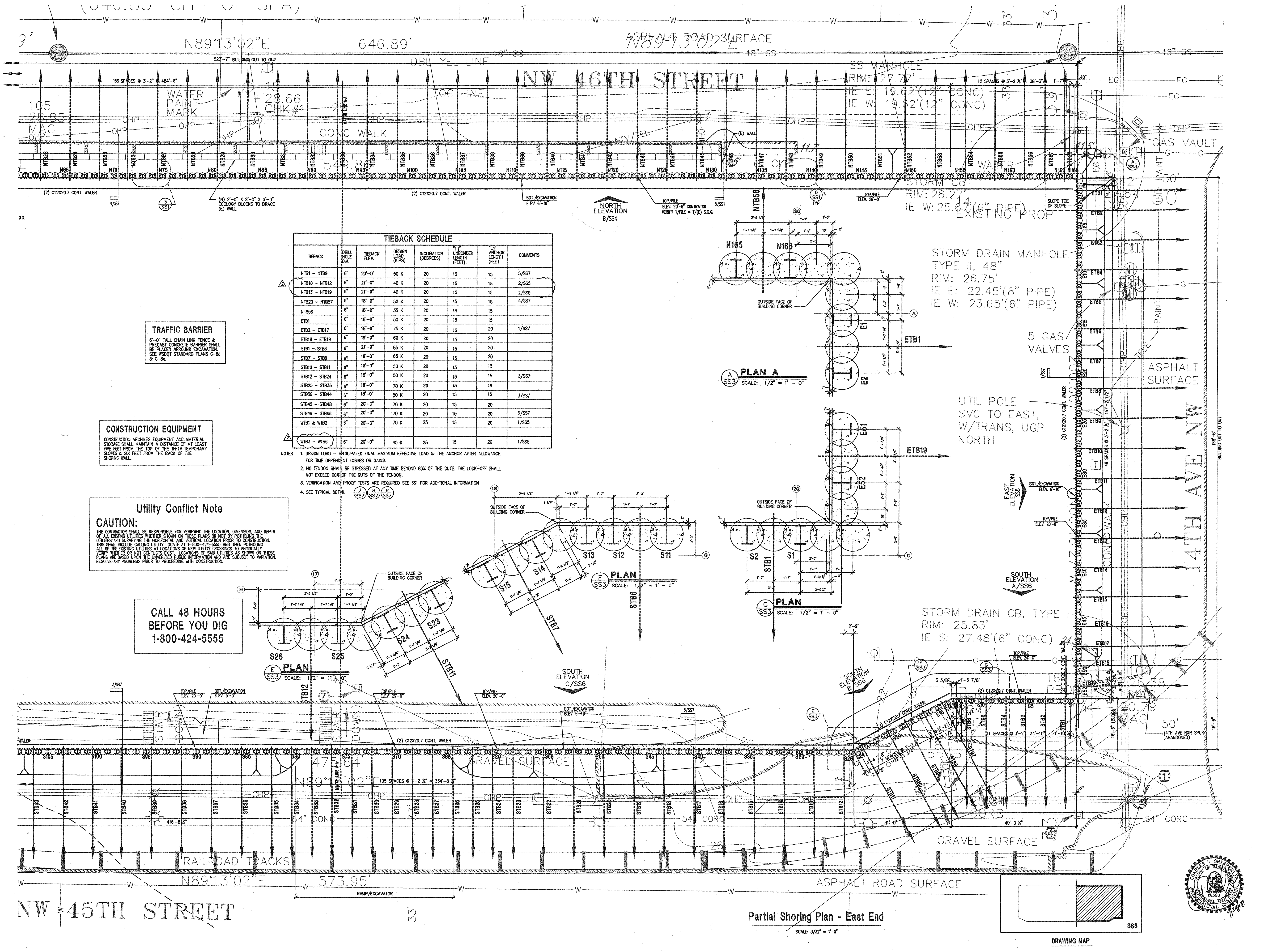
Seattle, WA 98109
206.285.4512 (V) 206.285.0618 (F)

SHEET NO:
SS2



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TIEBACK SCHEDULE

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NTB58	6"	18'-0"	35 K	20	15	15	
ETB1	6"	18'-0"	50 K	20	15	15	
ETB2 – ETB17	6"	18'-0"	75 K	20	15	20	1/SS7
ETB18 – ETB19	6"	19'-0"	60 K	20	15	20	
STB1 – STB6	6"	21'-0"	65 K	20	15	20	
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STB12 – STB24	6"	18'-0"	50 K	20	15	15	3/SS7
STB25 – STB35	6"	18'-0"	70 K	20	15	18	
STB36 – STB44	6"	18'-0"	50 K	20	15	15	3/SS7
STB45 – STB48	6"	20'-0"	70 K	20	15	20	
STB49 – STB66	6"	20'-0"	70 K	20	15	20	6/SS7
WTB1 & WTB2	6"	20'-0"	70 K	25	15	20	1/SS5
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4. SEE TYPICAL DETAIL 7/SS7 8/SS7 9/SS7

Partial Shoring Plan - East End

SCALE: 3/32" = 1'-0"

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TITLE: SHORING PLAN (EAST)
SCALE: AS NOTED
DATE: 10/15/08
DWN BY: JTM
CHK BY: PJH
DPD NO. 6156774
JOB NO. 07228C
PERMIT 11/12/07
PERMIT 05/15/08
PERMIT REV ③ 06/30/08
COORD. SET 08/01/08
CONSTR. SET 10/15/08
CONSTR. REV ① 03/31/09

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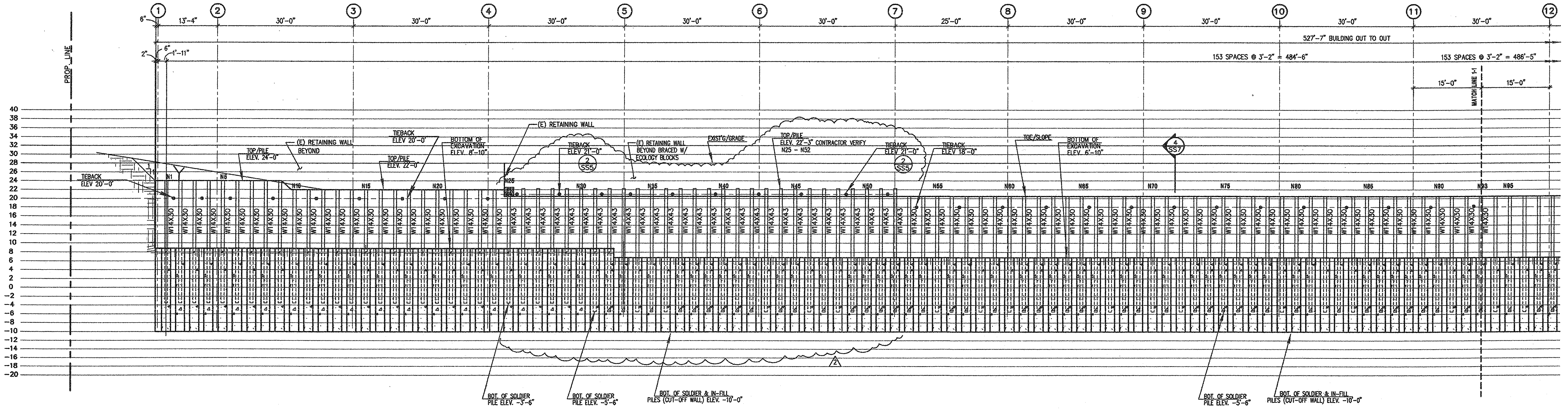
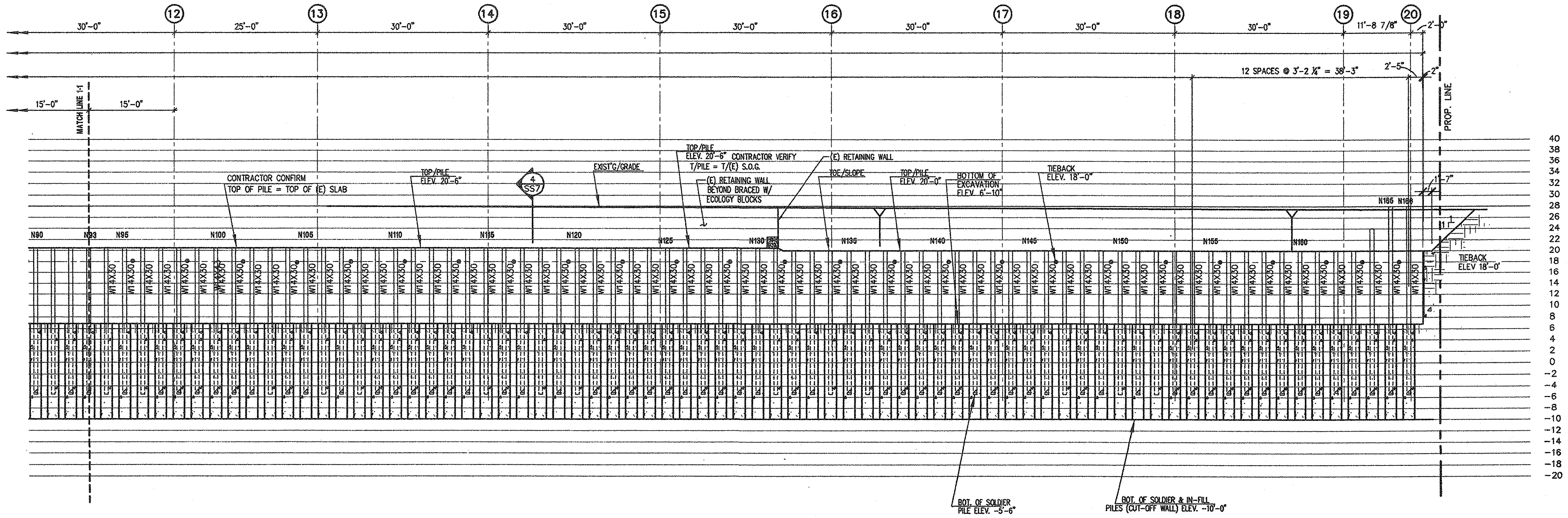
SHEET NO:
SS3

CTE JOB NO. 07228C



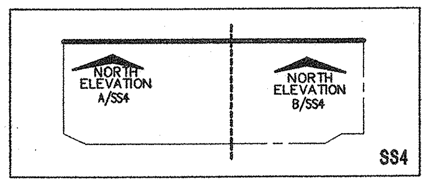
PARTIAL SHORING ELEVATION "A" - NORTH

SCALE: 3/32" = 1' - 0"



PARTIAL SHORING ELEVATION "B" - NORTH

SCALE: 3/32" = 1' - 0"



DRAWING MAP

CTE JOB NO. 07228C

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TITLE: SHORING ELEV (NORTH)	
SCALE:	AS NOTED
DATE:	10/15/08
DWN BY:	JTM
CHK BY:	PJH
DPD NO.	6156774
JOB NO.	07228C
PERMIT	11/12/07
PERMIT	05/15/08
PERMIT REV 3	06/30/08
COORD. SET	08/01/08
CONSTR. SET	10/15/08
CONSTR. REV 1	03/31/09

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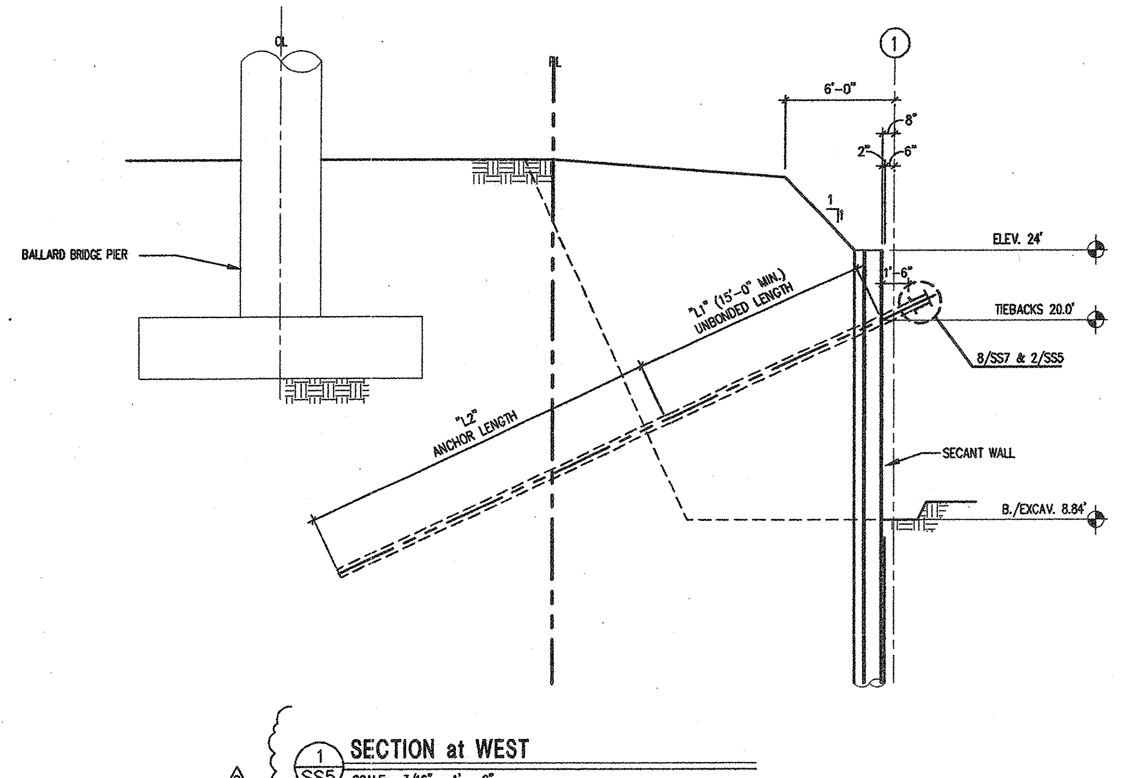
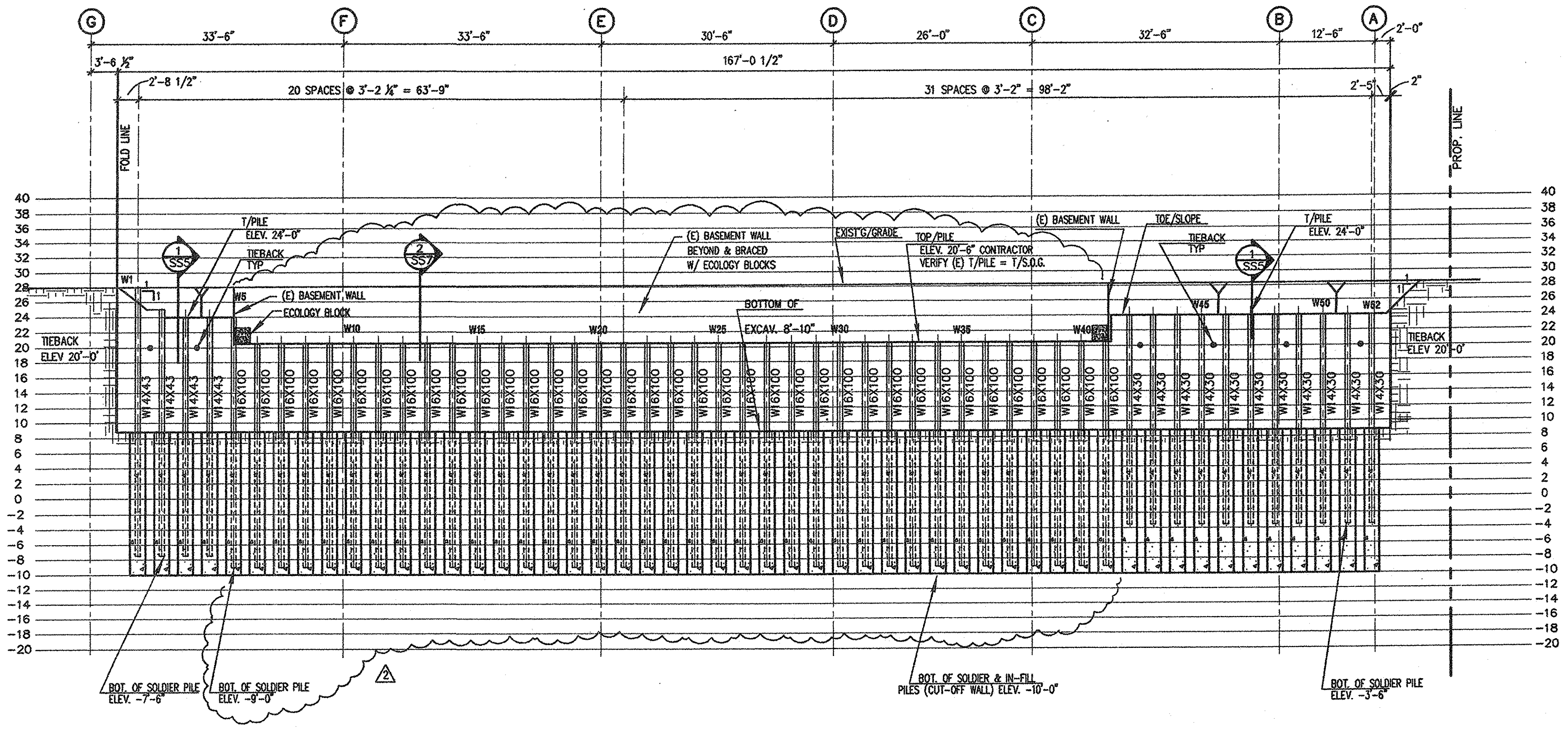
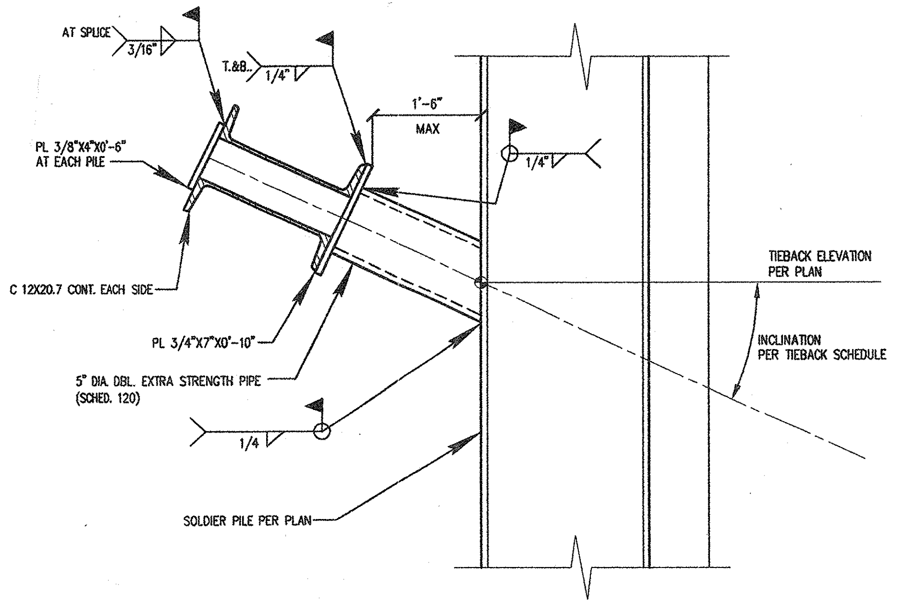
SHEET NO:
SS4



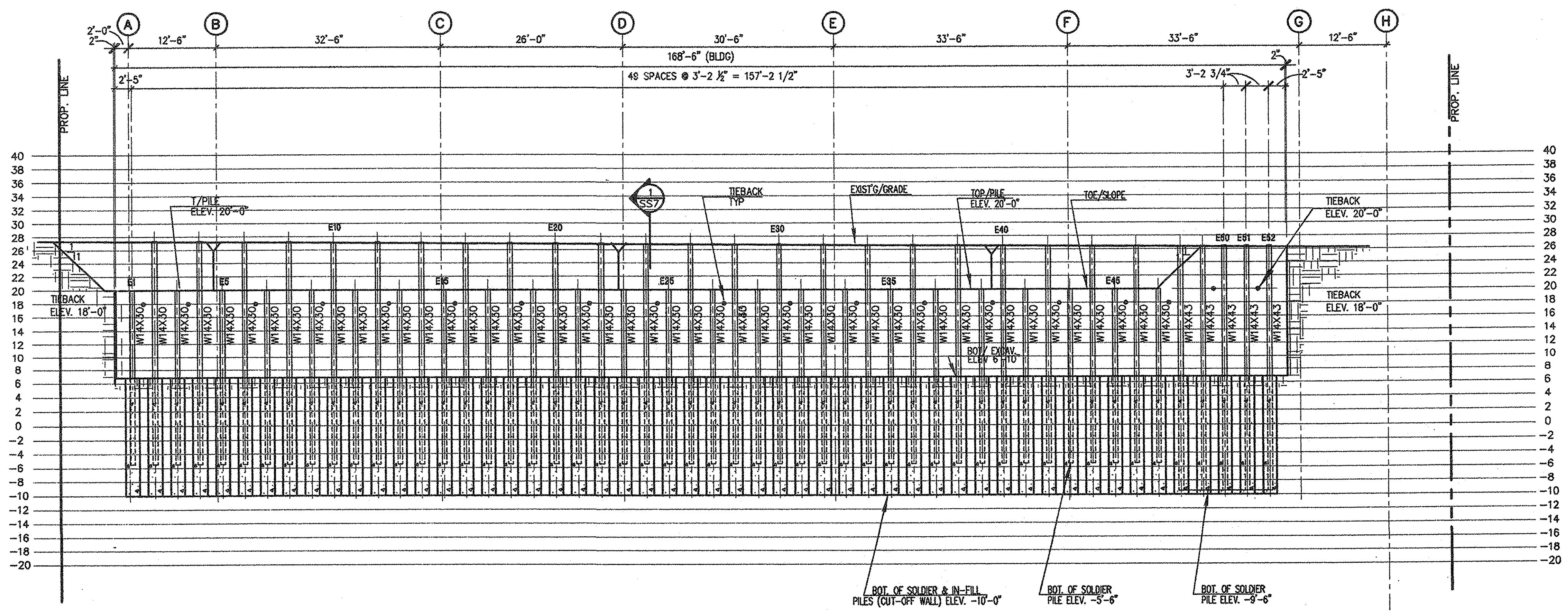
SECTION at WEST
1/SS5 SCALE: 3/16" = 1' - 0"



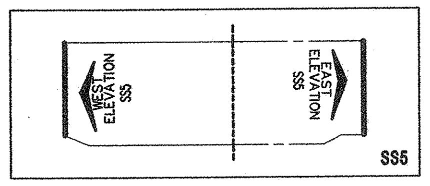
SHORING ELEVATION - WEST
SCALE: 3/32" = 1' - 0"



TIEBACK ANCHOR
2/SS5 SCALE: 1 1/2" = 1' - 0"



SHORING ELEVATION - EAST
SCALE: 3/32" = 1' - 0"



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CTE JOB NO. 07228C

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TITLE: SHORING ELEV (E&W)
SCALE: AS NOTED
DATE: 10/15/08
DWN BY: JTM
CHK BY: PJH
DPD NO. 6156774
JOB NO. 07228C
PERMIT 11/12/07
PERMIT 05/15/08
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COORD. SET 08/01/08
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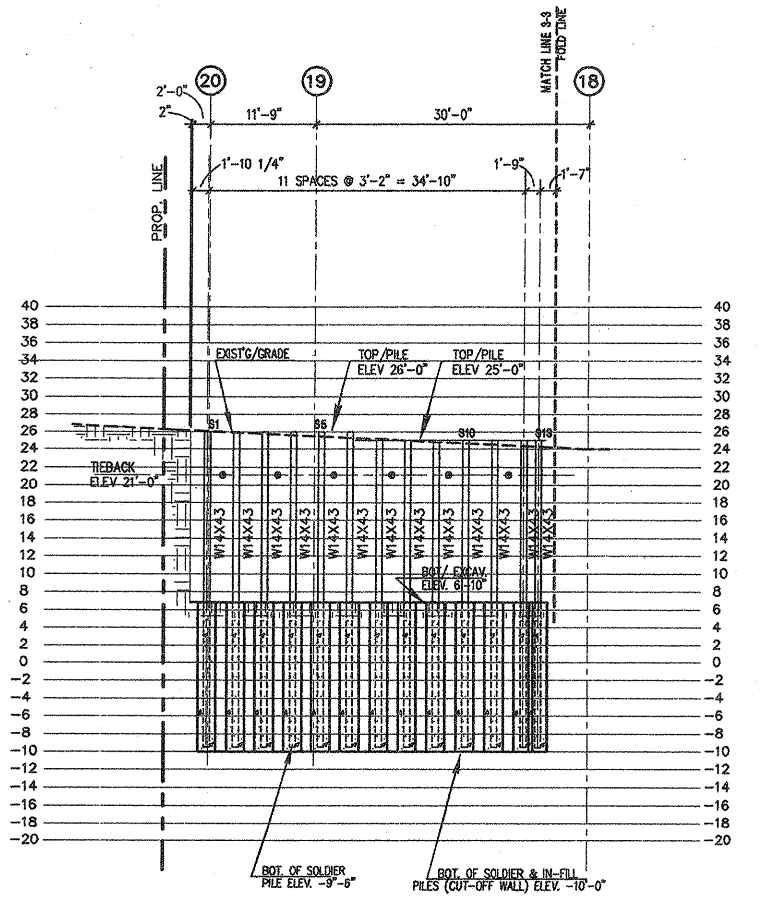
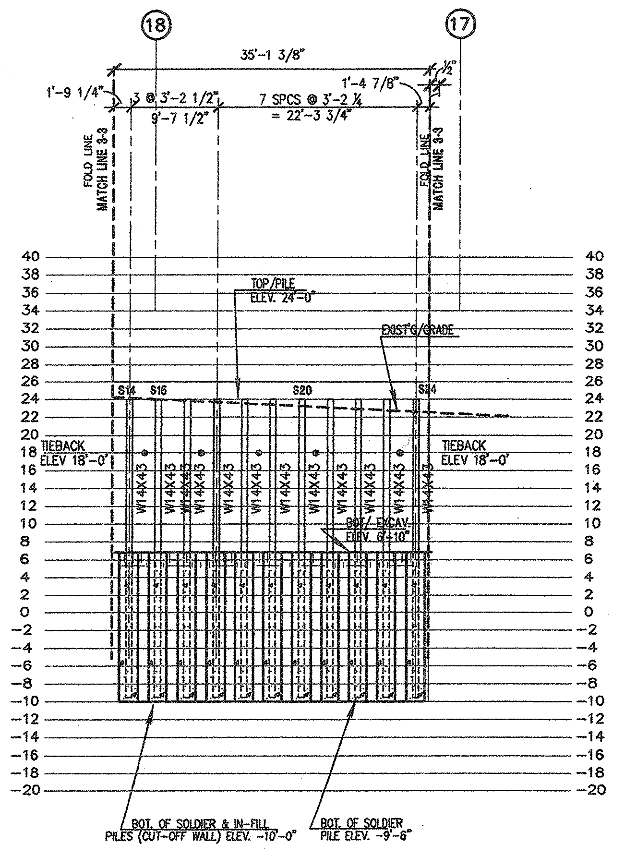
SHEET NO:
SS5



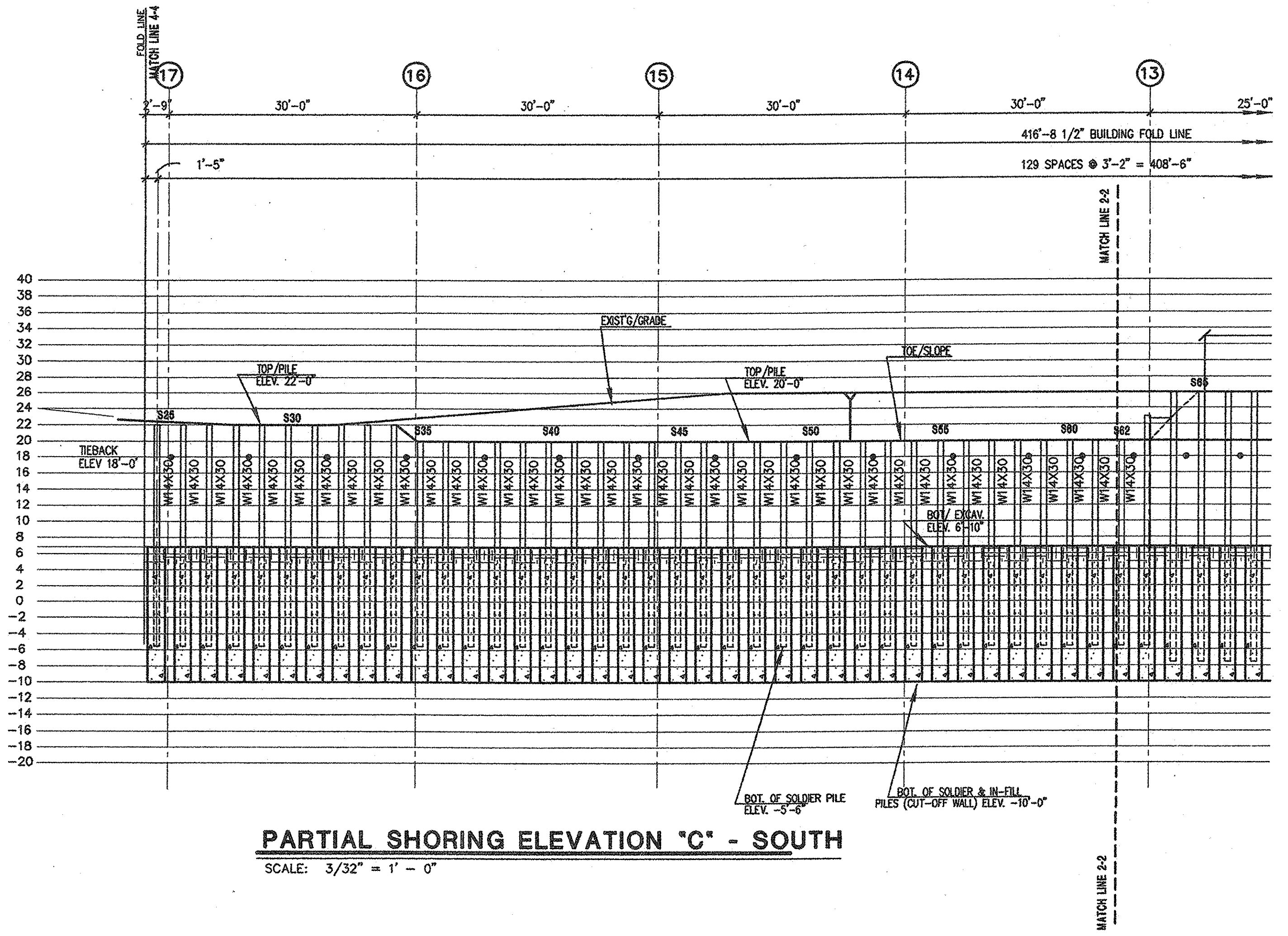
PARTIAL SHORING ELEVATION "A" - SOUTH

SCALE: 3/32" = 1' - 0"



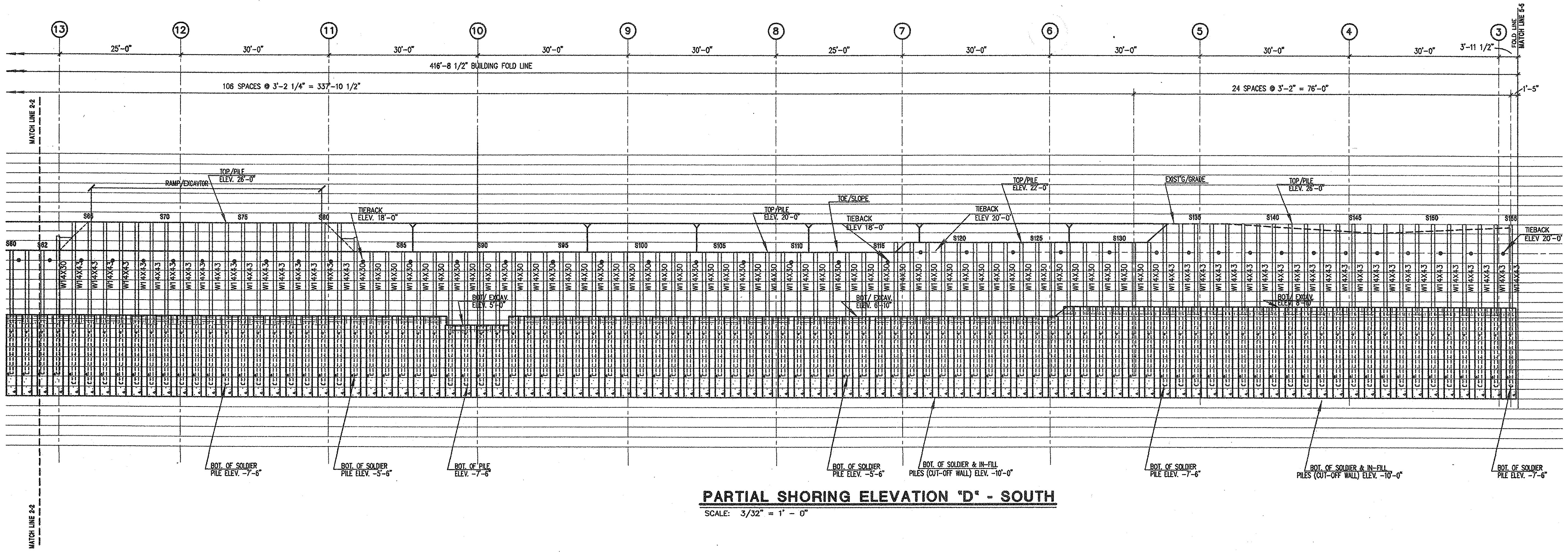
PARTIAL SHORING ELEVATION "B" - SOUTH

SCALE: 3/32" = 1' - 0"



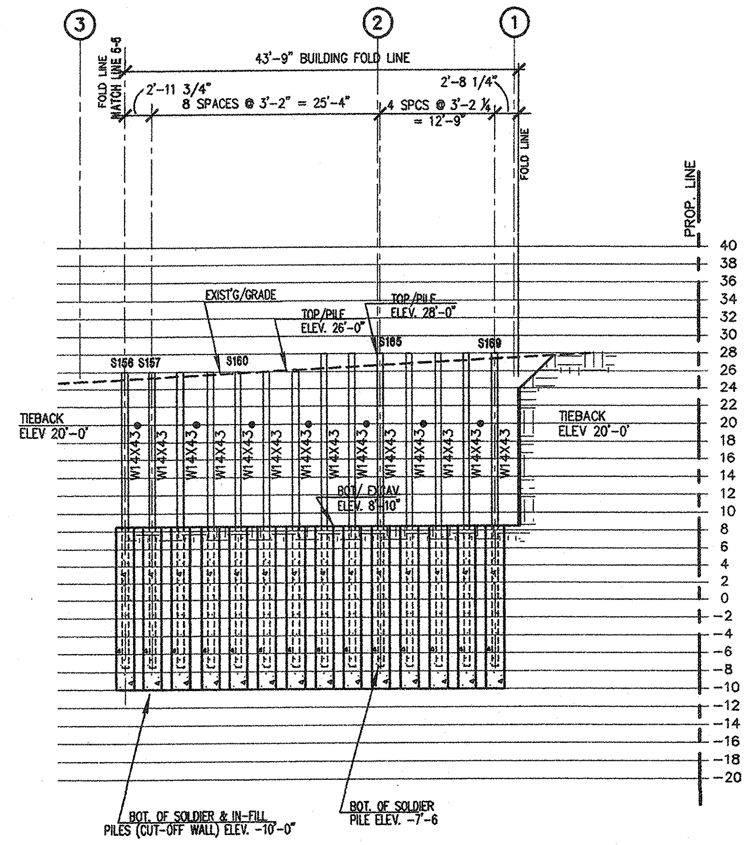
PARTIAL SHORING ELEVATION "C" - SOUTH

SCALE: 3/32" = 1' - 0"



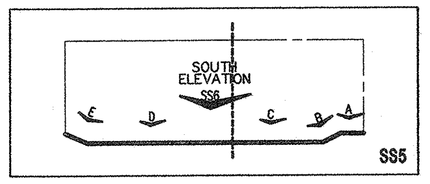
PARTIAL SHORING ELEVATION "D" - SOUTH

SCALE: 3/32" = 1' - 0"



PARTIAL SHORING ELEVATION "E" - SOUTH

SCALE: 3/32" = 1' - 0"



DRAWING MAP

CHARLES T GRIFFES, JR
18520
9/24/09

CTE JOB NO. 07228C

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SEATTLE, WA 98107

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TITLE: SHORING ELEV (SOUTH)

SCALE:	AS NOTED
DATE:	10/15/08
DWN BY:	JTM
CHK BY:	PJH
DPD NO.	6156774
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PERMIT	11/12/07
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CONSTR. REV ①	03/31/09

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SHEET NO:

SS6

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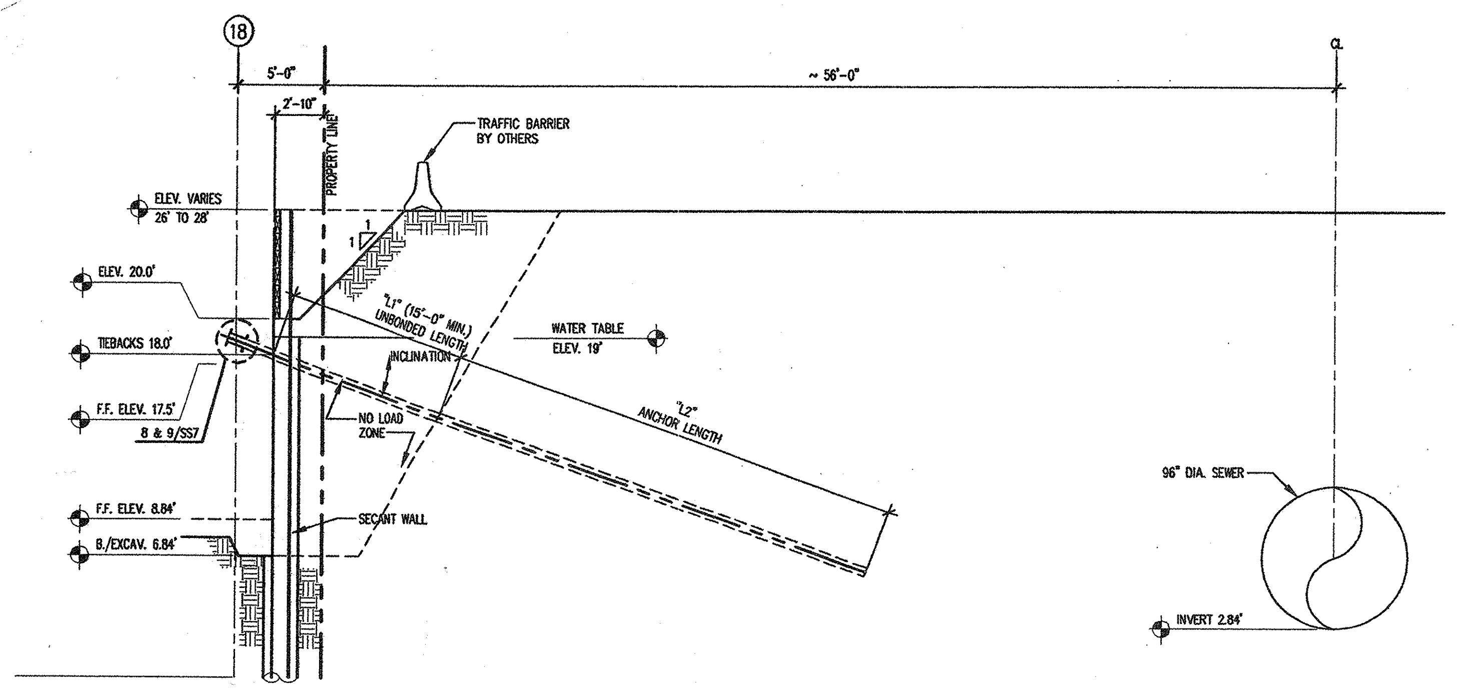
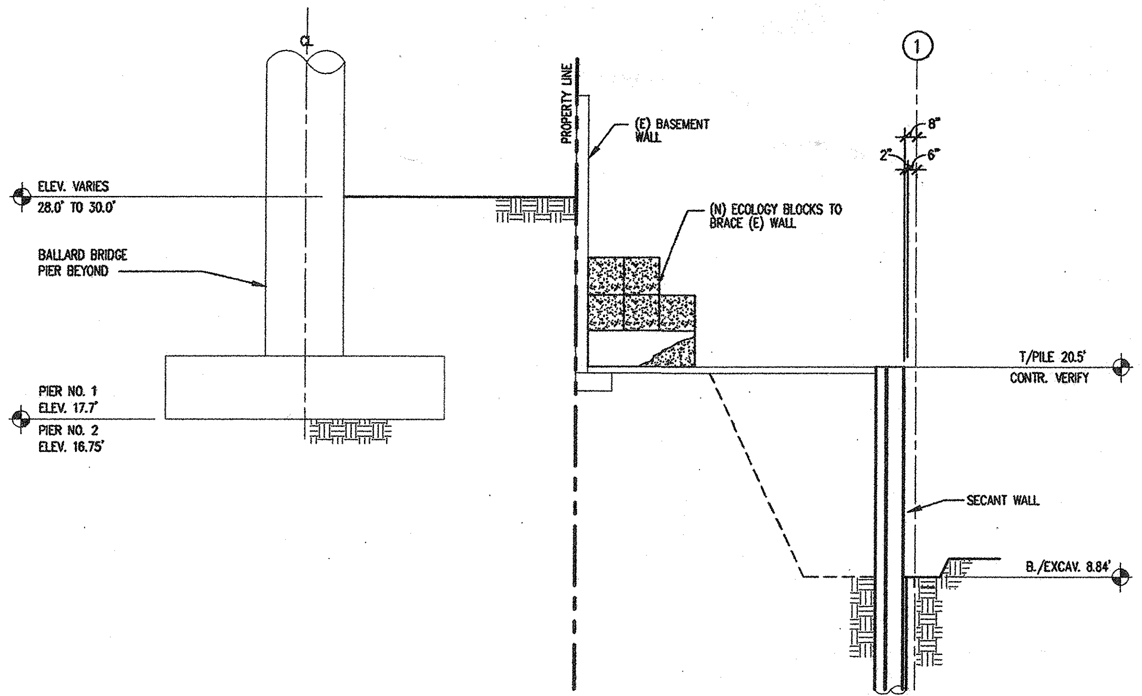


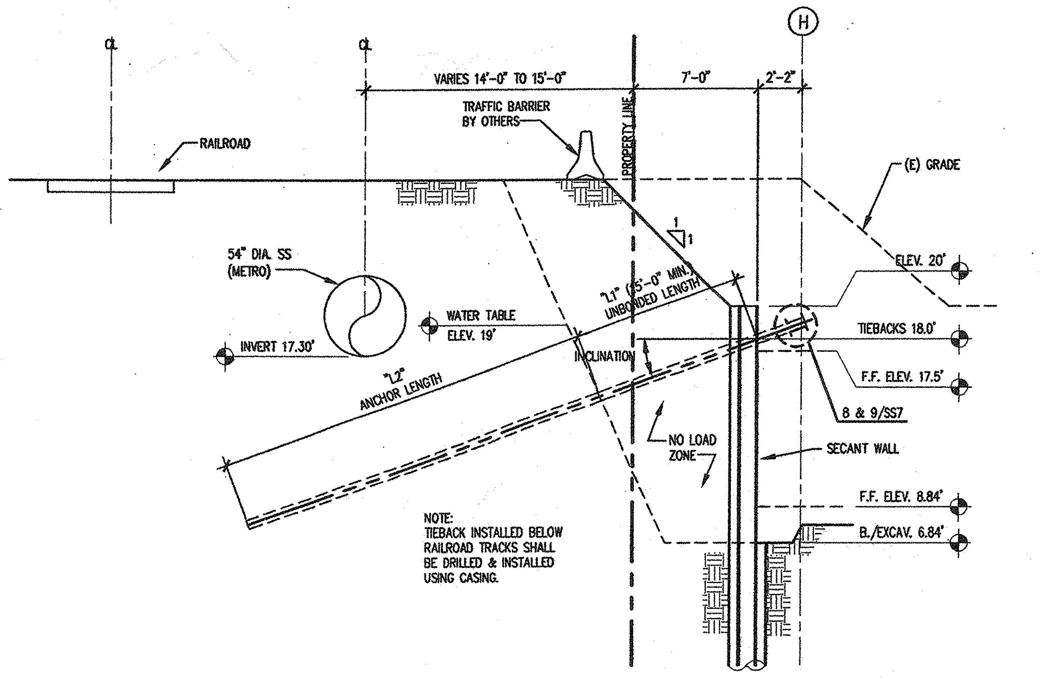
2

1/SS7 SECTION at EAST
SCALE: 3/16" = 1' - 0"



2

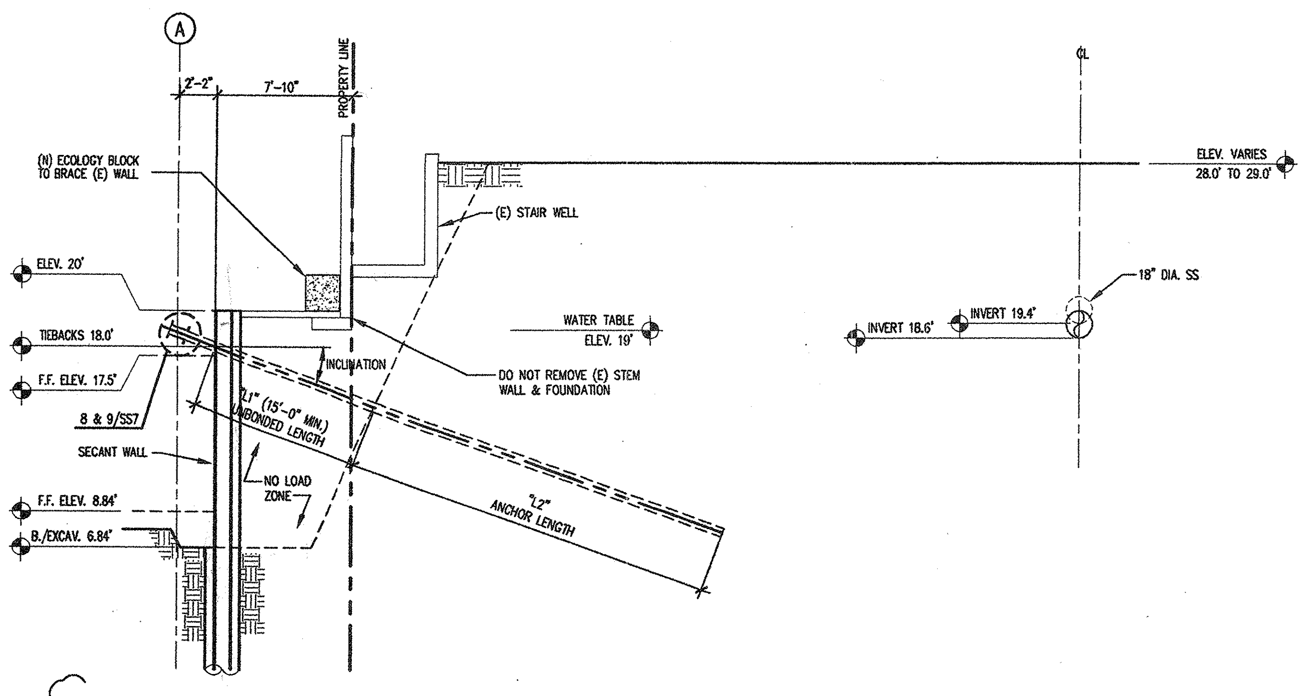
2/SS7 SECTION at WEST
SCALE: 3/16" = 1' - 0"



NOTE:
TIEBACK INSTALLED BELOW RAILROAD TRACKS SHALL BE DRILLED & INSTALLED USING CASING.

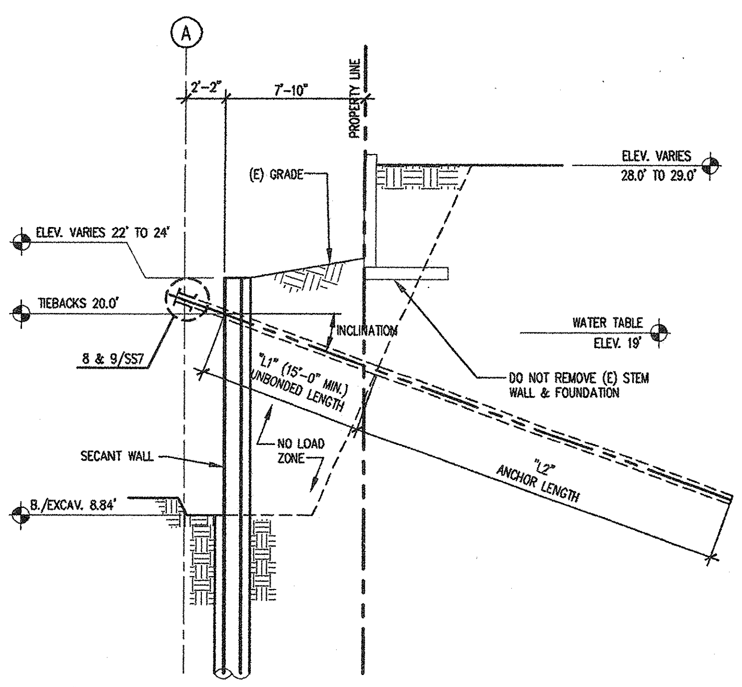
2

3/SS7 SECTION at SOUTH
SCALE: 3/16" = 1' - 0"



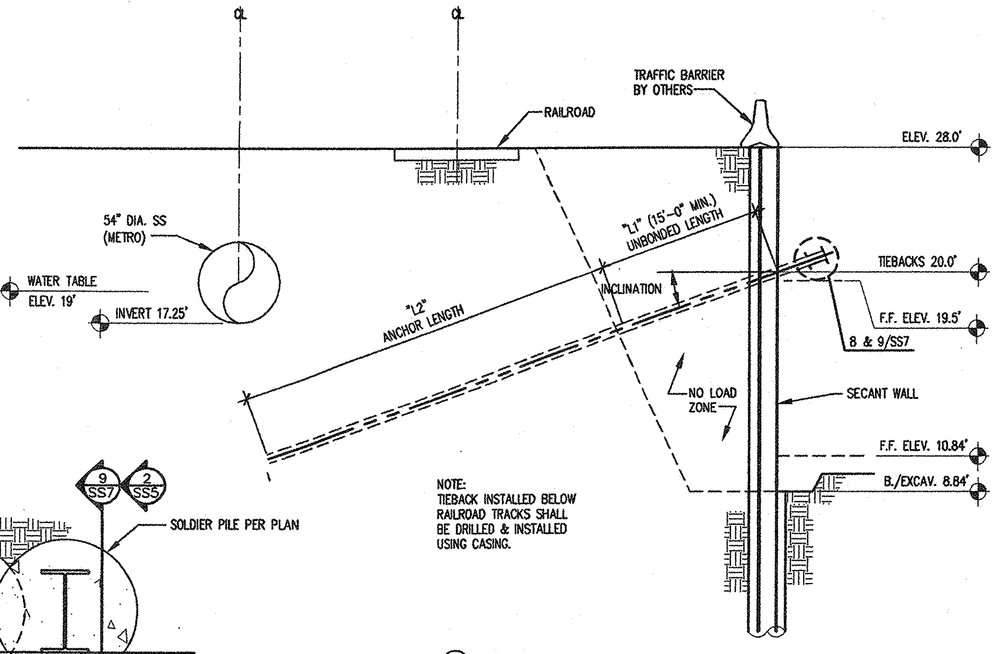
2

4/SS7 SECTION at NORTH
SCALE: 3/16" = 1' - 0"



2

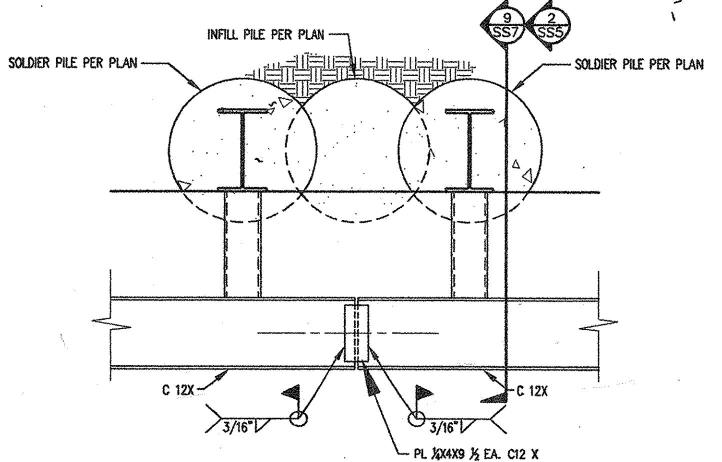
5/SS7 SECTION at NORTHWEST CORNER
SCALE: 3/16" = 1' - 0"



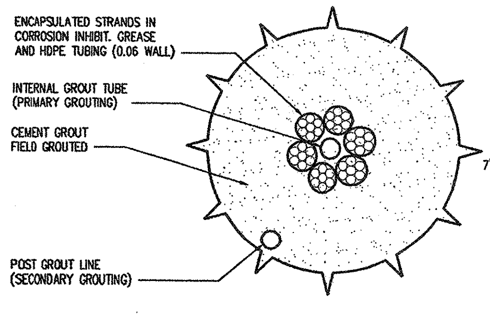
NOTE:
TIEBACK INSTALLED BELOW RAILROAD TRACKS SHALL BE DRILLED & INSTALLED USING CASING.

2

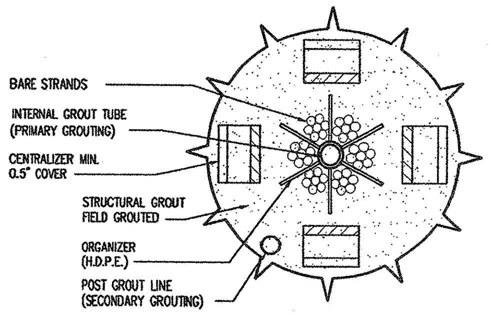
6/SS7 SECTION at SOUTHWEST CORNER
SCALE: 3/16" = 1' - 0"



PLAN A-A (C 12X SPLICE)
SCALE: 3/4" = 1' - 0"

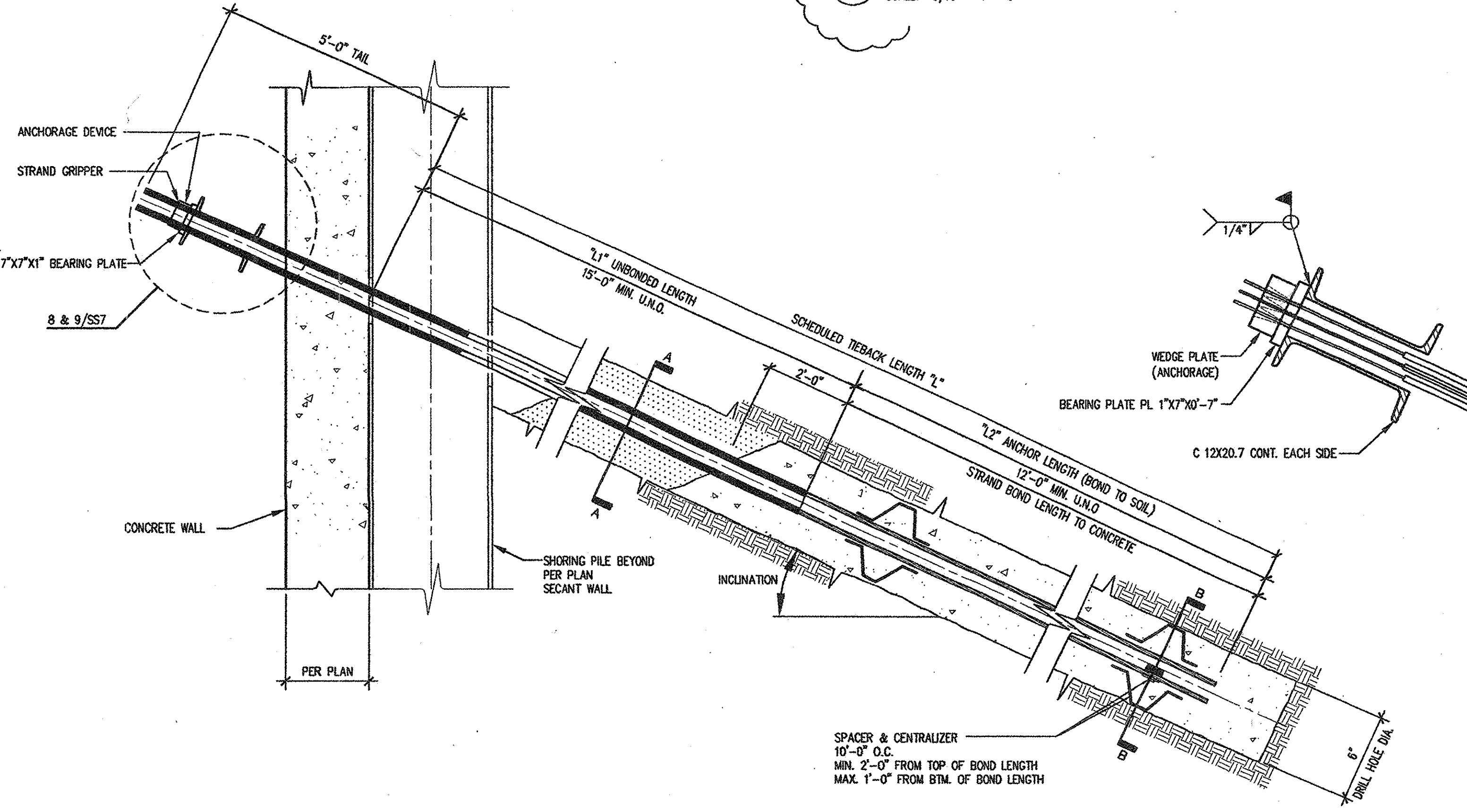


ANCHOR SECTION A-A
FREE LENGTH



ANCHOR SECTION B-B
BOND LENGTH

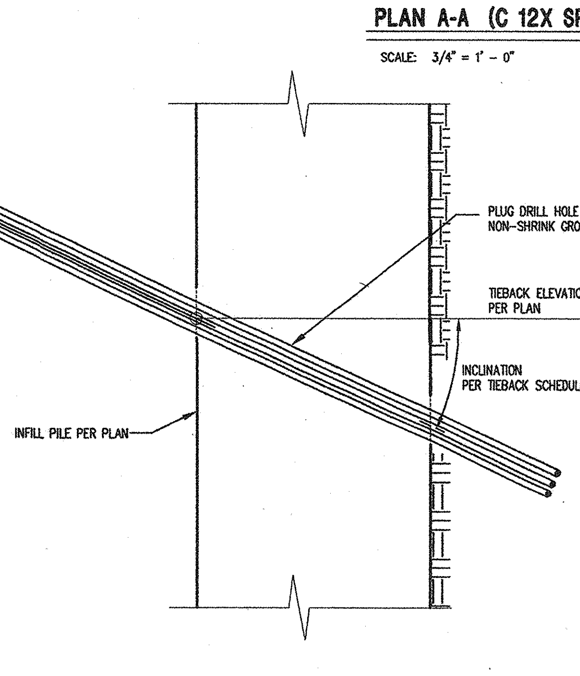
SCALE: NONE



MATERIAL SPECIFICATIONS;
STRAND = 0.6" DIA., 7-WIRE, 270 KSI, ASTM A-722, LOW RELAXATION
HDPE. BEARING PLATE CONFORMS TO ASTM A-36.

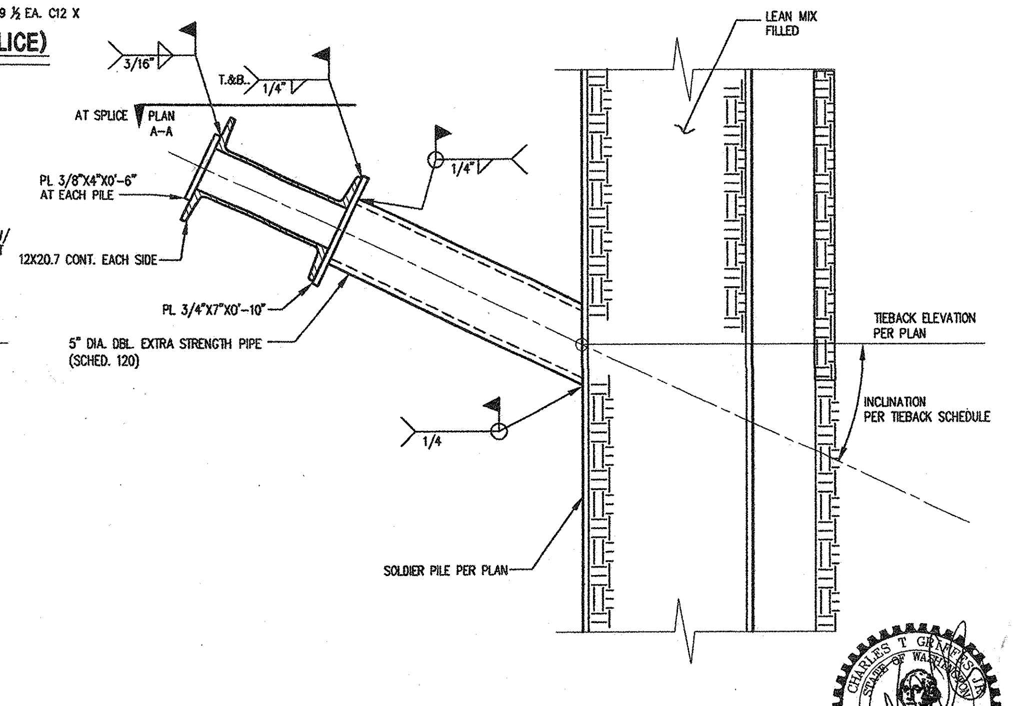
2

7/SS7 TYPICAL TIEBACK ANCHOR SECTIONS and DETAILS
SCALE: NONE



2

8/SS7 TYPICAL TIEBACK ANCHOR
SCALE: 1 1/2" = 1'-0"



2

9/SS7 TYPICAL TIEBACK ANCHOR
SCALE: 1 1/2" = 1'-0"

CHARLES T GRIMES JR
18520
9/24/08

CTE JOB NO. 07228C

CLARK DESIGN GROUP PLLC
169 Western Avenue W
Seattle, Washington 98119
Tel 206 782 8208 Fax 206 782 7818

1451 / 1401 NW 46TH STREET
SEATTLE, WA 98107

©CDG

TITLE: SECTION & DETAILS
SCALE: AS NOTED
DATE: 10/15/08
DWN BY: JTM
CHK BY: PJH
DPD NO. 6156774
JOB NO. 07228C
PERMIT 11/12/07
PERMIT 05/15/08
PERMIT REV 3 06/30/08
COORD. SET 08/01/08
CONSTR. SET 10/15/08
CONSTR. REV 1 03/31/09

CLARK
DESIGN GROUP PLLC

169 Western Avenue W
Seattle, Washington 98119
Tel 206 782 8208 Fax 206 782 7818

CT ENGINEERING
Structural & Civil Engineers
180 Nickerson Street Suite 302
Seattle, WA 98109
206.285.4512 (V) 206.285.0618 (F)

SHEET NO:
SS7

APPENDIX I

Sampling and Analysis Plan

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

Sampling and Analysis Plan
Appendix I of the Final RI Report, FS, and PCA

sound environmental strategies corporation

Property:

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Prepared for:

Bridge Group II, LLC
9032 42nd Avenue Northeast
Seattle, Washington

and

Block at Ballard II, LLC
801 Grand Avenue
Des Moines, Iowa

January 19, 2010

www.soundenvironmental.com

Sound Environmental Strategies Corporation

2400 Airport Way South, Suite 200

Seattle, Washington 98134-2020

TABLE OF CONTENTS

TABLES

ATTACHMENTS

1.0 INTRODUCTION

Sound Environmental Strategies Corporation (SES) has prepared this Sampling and Analysis Plan (SAP) for the Former Wesmar Property located in Seattle, Washington (hereinafter referred to as the Property) on behalf of Bridge Group II, LLC and Block at Ballard II, LLC. The results of the remedial investigation (RI) conducted on the Wesmar Property indicate that arsenic- and polycyclic aromatic hydrocarbon (PAH)-contaminated soil and arsenic-contaminated groundwater are present beneath the Property. This SAP summarizes the data collection efforts that will be conducted during the cleanup action. The SAP has been prepared in accordance with the Washington State Department of Ecology Agreed Order administrative mechanism.

Data collected under the program described in the SAP will be used to evaluate effectiveness of the cleanup action and ensure compliance under the Washington State Model Toxics Control Act (MTCA).

2.0 BACKGROUND

2.1 Property Location and Description

The Property includes a single tax parcel (King County parcel number 276830-3245) that covers approximately 102,132 square feet (2.34 acres) of land. The Property is listed as 1401 & 1451 Northwest 46th Street and is located approximately 5 miles northwest of downtown Seattle, Washington.

Wesmar, a chemical distributor specializing in cleaners, sanitizers, and water treatment compounds, was the most recent occupant of the western portion of the Property. In addition, the eastern portion of the Property was recently occupied by Colortech, Inc., a company that provided coating services for metals and metal-formed products. The Property is currently vacant; it is occupied only by the concrete floor slabs of the two former single-story, slab-on-grade buildings that were constructed in 1906 and 1957, respectively. The floor grade of the former buildings lies approximately 8 to 10 feet below the surrounding street grade.

A wastewater sump was located on the southern portion of the former Wesmar building. The wastewater sump is tied into the on-Property stormwater system and eventually ties in to the 96-inch-diameter combined sewer main located within 14th Avenue Northwest. The wastewater sump did not appear to be frequently used as part of the Wesmar operations.

The Property is scheduled to undergo redevelopment to a multi-story, mixed-use commercial/retail complex. Redevelopment plans involve construction of a subsurface parking lot to an approximate depth of 20 feet below the surrounding street surface grade.

The Property is located within the Ballard Interbay Northend Manufacturing and Industrial Center (BINMIC) area, an approximately 971-acre area incorporating waterfront and uplands northwest of downtown Seattle. The BINMIC area is well known as a region with significant environmental issues as a result of the various historical industrial operations that were conducted in the area. The BINMIC boundaries are designated by Northwest Market Street and Northwest Leary Way in Ballard to the north; Third Avenue Northwest and Third Avenue West to the east; the Chittenden Locks and Magnolia to the west; and Dravus Street to the south. The

Property is located within the North BINMIC area, which is zoned general industrial or industrial buffer and includes such maritime businesses as commercial fishing, ship repair and boatyards, metal fabricators, print shops, warehousing, and storage. In the vicinity of the Property, retail stores, office buildings, service providers, and commercial properties are prominent tenants. In addition to industrial applications, several single-family homes and apartment buildings are located near the northern boundary of the North BINMIC area.

2.2 Chemicals of Concern

Soil samples will be collected during the cleanup action excavation, and groundwater samples will be collected following the completion of the Property remediation activities. The following chemicals have been identified as the primary chemicals of concern (COCs) for the Property.

- Arsenic in soil and groundwater
- PAHs in soil

Secondary COCs for the Property include the following:

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

The samples will be analyzed according to the methods described in Section 3.0 below.

3.0 SAMPLING PROCEDURES

The objectives for compliance monitoring are to document compliance with waste analysis profiles and to confirm that cleanup levels are achieved. Therefore, the following separate compliance monitoring activities are planned for the remedial action:

- Soil profiling for off-Property treatment or disposal.
- Confirming that cleanup levels have been achieved.
- Monitoring the water discharged from the subgrade water intrusion control system for stormwater compliance.
- Evaluating the condition of groundwater in the vicinity of the institutional control areas associated with the Property.

3.1 Soil Sample Locations

The excavation will be conducted based on the findings of the RI and previous investigations. Soil will be excavated to a total depth of 10 to 15 feet below ground surface (bgs). A systematic sampling grid will be superimposed over the exposed excavation area being tested (sidewalls and floor). A grid size of 50 feet will result in a statistically valid number of at least 43 soil samples based on the size of Area A (Figure 22 of the Final Remedial Investigation Report, Feasibility Study, and Proposed Cleanup Action [RI/FS and PCA]). Confirmation soil samples will be collected from each grid node following excavation and submitted for analysis of PAHs and arsenic.

Profile samples will be collected from the remaining construction excavation-generated soils to evaluate appropriate soil handling methods and disposal options.

3.2 Groundwater Sample Locations and Schedule

Following completion of the remedial activities, water samples will be collected from the discharge areas leading from the subgrade water intrusion control system, per the discussion in Section 8.4 of the RI/FS and PCA.

3.3 Sampling Procedures

The field sampling procedures for soil sample collection and handling are discussed in detail below. All field sampling data will be recorded and documented on field forms as described in Section 4.0, Sample Handling and Custody.

3.3.1 Construction of Soil Sampling Grid

When the remediation construction contractor reaches the predetermined limits of the remedial excavation as defined in the RI/FS and PCA, performance soil samples will be collected from the bottom and sidewalls of the excavation (Figure 22 of the RI/FS and PCA). Soil samples will be collected within a surveyed grid measuring 50 feet by 50 feet.

Performance and/or confirmation soil samples collected from the bottom and sidewalls of the excavation will be collected from the grid intersections and along the sidewall using the procedures discussed in Section 3.3.2 and as presented on Figure 22 of the RI/FS and PCA. Performance and/or confirmation soil samples collected from the sidewalls of the remedial excavation will be collected every 50 feet or less, depending on the depth of the remedial excavation, and located and identified by nearest grid intersection. The sample ID will be determined by the nearest grid intersection. Sidewall samples will be collected at the farthest extent of contamination or just prior to encountering the shoring wall.

3.3.2 Performance and Confirmation Soil Sampling

Performance sampling will be conducted to assess whether soil containing concentrations of COCs above applicable MTCA Method A cleanup levels has been excavated. In the event that compliance samples indicate the presence of COCs in excess of their respective cleanup levels, SES will excavate a 50-foot by 50-foot area to a depth of 1 foot below the previously sampled elevation, and a subsequent sample will be collected from the grid intersection. Confirmation sampling of soil will be conducted in excavated areas where performance sampling indicates concentrations of COCs in the soil are below applicable MTCA Method A cleanup levels. The soil samples will be collected and handled following the procedures listed below:

- Soil samples will be collected directly from the sidewalls and/or bottom of the remedial excavation using either stainless steel or plastic sampling tools. Soil samples collected at depths within 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, as appropriate.
- Information logged during sampling will include, at a minimum, sample depth, Unified Soil Classification System description, soil moisture content, observation

physical indications of contamination (e.g., odors, staining), and field screening results obtained using a photoionization detector.

- Soil samples will be immediately transferred into laboratory-supplied sample containers. Analytical and in-field sample preservation methods for soil samples analyzed for arsenic, DRPH, BTEX, and PAHs are presented in Table I.2. Care will be taken not to handle the seal or inside cap of the container when placing the sample in the container. The container will be filled to minimize headspace (when applicable) and the seal/cap will be secured.
- Sample containers will be labeled with the following information: client, project name and number, date and time sampled, sample identification, and sampler's initials.
- Samples will be logged on a Sample Chain of Custody form and placed in a chilled cooler at 4 degrees Celsius (°C) for transport to the laboratory while maintaining chain-of-custody protocols.
- Laboratory quality assurance/quality control (QA/QC) samples will be submitted as described in the Quality Assurance Project Plan.
- All disposable sampling and health and safety supplies and equipment will be discarded in a labeled 55-gallon drum at the Property.

3.3.3 Groundwater Sample Collection and Handling Procedures

The containers, preservation procedures, and holding times for groundwater samples are shown in Table I.1 and follow standard laboratory protocols. Groundwater samples for compliance monitoring will be collected and handled as described in Section 8.4 of the RI/FS and PCA.

3.4 Sample Designation

Each sample collected during the cleanup action will be assigned a unique sample identifier and number. The sample identifier and number will be filled out in indelible ink and affixed to appropriate containers immediately prior to sample collection. In addition to the sample identifier and number, the sample labels will include the following information: client name, project name and number, date and time of sample collection, and sampler's initials. A Sample Summary Form will be maintained as each sample is collected; the form will include the sample location and depth, sample number and identifier, and other observations regarding the sample. The sample designation procedures for soil samples collected during the cleanup action are detailed below.

3.4.1 Soil Sampling

Bottom and sidewall soil samples collected from remedial excavation will be assigned a unique sample identifier that will include the components listed below.

- The grid intersection identification (e.g., A01)
- The depth in feet bgs (e.g., 7 feet)
- The sample type (e.g., bottom “B”, sidewall “SW’)

For example, a soil sample collected from the bottom of the remedial excavation at the bottom of grid intersection A01 at a depth of 7 feet bgs on would be numbered A01-7-B. The sample identification will be placed on the sample label, Field Report form, Sample Summary Form, and Sample Chain of Custody form.

3.4.2 Groundwater Sampling

The groundwater samples collected for groundwater performance monitoring will be assigned a unique sample identifier and number. The number will include a prefix of the well identification and the date. For example, the groundwater sample collected from the subgrade water intrusion control system on November 22, 2010, would be numbered SWICS-20101122. The sample identification will be placed on the sample label, the field report form, the groundwater purge and sample form, and the sample chain of custody form.

3.5 Soil Analytical Methods

Selected soil samples collected during the cleanup will be submitted for laboratory analysis of DRPH by Northwest Total Petroleum Hydrocarbon Method NWTPH-Dx, PAHs by United States Environmental Protection Agency (EPA) Method 8270C SIM, arsenic by EPA Method 200.8, and BTEX and VOCs by EPA Method 8260B.

Analytical methods and reporting limits are identified in Table I.2.

3.6 Groundwater Analytical Methods

Confirmation groundwater samples will be submitted laboratory analysis of arsenic by EPA Method 200.8.

Analytical methods and reporting limits are identified in Table I.2.

4.0 SAMPLE HANDLING AND CUSTODY

4.1 Sample Handling

Sample collection and handling considerations associated with the remediation field work include the following:

- Samples are to be collected and containerized in order of decreasing volatility of parameters.
- A sufficient sample volume will be collected from each location sampled to serve the needs of all analyses, including matrix spikes, matrix spike duplicates, and field duplicates.

4.2 Sample Containers, Holding Times, and Preservation and Turnaround Times

Table I.1 presents sample container, holding time, and preservation requirements for the listed analytical parameters. New laboratory-supplied sample containers will be used to collect the samples.

Once collected, each sample will be labeled and placed into a matrix-specific sample cooler. The samples cooler will serve as the shipping container and will be provided by the laboratory with the sample containers. The sample cooler will be packed with ice to cool samples to 4°C during shipment. Samples are to be transported to the laboratory promptly in order to provide ample time for analyses to be conducted within the established maximum holding times. The maximum interval between sample collection and shipment is to be 1 business day.

The project manager or designee is responsible for coordinating with the laboratory for sample shipment via laboratory pick-up or overnight delivery service. State and federal regulations concerning the shipment of environmental samples to a laboratory for analysis will be followed.

4.3 Sample Packaging and Shipping

Immediately after samples are collected and labeled for laboratory analysis, they will be placed in a matrix-specific cooler. The samples will be packed with shock-absorbent materials, such as bubble wrap, to prevent movement or breakage of the sample jars during transport. The cooler will be filled with wet ice in order to meet the 4°C preservative requirement. A temperature blank will accompany each cooler.

The Sample Chain of Custody form will be placed in a zip-lock bag and taped to the inside of the cooler. The cooler will be sealed with packaging tape and custody seals will be placed along the cooler lid in order to prevent or indicate tampering. The cooler containing the environmental samples will be picked up by the laboratory or arrangements can be made to have the cooler delivered to the laboratory by an overnight delivery service, such as Federal Express. If an overnight delivery service is used, the package must be scheduled for priority overnight service so that the temperature preservative requirement is not exceeded.

4.4 Sample Documentation

Sample documentation includes sample designation, sample labeling, groundwater purge and sample forms, field notes, and Sample Chain of Custody forms. Sample designation provides that each sample will be uniquely identified, labeled, and documented in the field at the time of collection. Each sample container will have a sample label affixed to the outside of the container in an obvious location. Information will be recorded on the label with water-resistant ink. The sample label will specify:

- Sample identification number
- Date and time of sample
- Preservation used
- Analytical methods
- Project name

The field logbook will be used to provide daily records of significant events, observations, and measurements during field investigations. The field logbook also will be used to document all sampling activities. All logbook entries will be made with indelible ink to provide a permanent record. Logbooks will be kept in the possession of the field technician during the on-Property work, and all members of the field personnel will have access to the notebook. These logbooks will be maintained as permanent records. The field logbooks are intended to provide sufficient data and observations to reconstruct events that occurred during installation and sampling. All logbooks will be given a unique label, and multiple logbooks will be assigned serial numbers. The following items will be recorded in the field logbook.

- Name, date, and time of entry
- Names and responsibilities of field crew members
- Name and titles of any Property visitors
- Descriptions of sampling procedures, and problems encountered
- Number and amount of samples taken at each location
- Details of sampling location
- Identification numbers of all samples collected
- Date and time of collection
- Sample collection method
- Decontamination procedures
- Field measurements (e.g., dissolved oxygen, oxidation-reduction potential, temperature, pH, and conductivity) and general observations

Each sample container is to be logged using a Sample Chain of Custody form prior to shipment or pickup by the laboratory (example attached). The Sample Chain of Custody form will be signed by the individual responsible for custody of the sample containers and will accompany the samples to the laboratory. Information to be recorded on the Sample Chain of Custody form should include:

- Sample matrix
- Sample collector's name
- Dates/times of sample collection
- Sample identification numbers
- Number and type of containers for each sample aliquot
- Type of preservation
- QC sample designation
- Analysis method
- Special handling instructions
- Destination of samples
- Name, date, time, and signature of each individual releasing the shipping container

The laboratory will designate a sample custodian. This individual is responsible for inspecting and verifying the correctness of the chain-of-custody records upon sample receipt. The sample custodian will accept the samples by signing the Sample Chain of Custody form and noting the condition of the samples in writing on the Sample Chain of Custody or other receipt form. The sample custodian will notify the project manager of any discrepancies. Samples received by the laboratory will be entered into a sample management system, which must include:

- Laboratory sample number
- Field sample designation

- Analytical batch numbers
- List of analyses requested for each sample container

Immediately after receipt, the samples will be stored in an appropriate secure storage area. The analytical laboratory will maintain written records showing the chronology of sample handling during the analysis process by various individuals at the laboratory.

5.0 EQUIPMENT DECONTAMINATION PROCEDURES

The decontamination procedures described below are to be used by field personnel to clean drilling, sampling, and related field equipment. Deviation from these procedures must be documented in the field logbook.

5.1 Sampling Equipment

All sampling equipment used (e.g., stainless-steel bowls, stainless-steel spoons, soil split-spoon samplers, etc.) will be cleaned using a three-step process, as follows:

1. Surfaces of equipment that would be in contact with the sample will be scrubbed with brushes using an Alconox solution.
2. Equipment will be rinsed and scrubbed with clean tap water.
3. Equipment will be rinsed a final time with deionized water to remove tap water impurities.

Decontamination of the reusable sampling devices will occur between the collection of each sample.

6.0 DISPOSAL OF INVESTIGATIVE-DERIVED WASTE

Excavated soil will be characterized and disposed of at a permitted facility.

TABLES

Table I.1
Sample Containers, Preservatives, and Holding Times
Former Wesmar Property
1401 and 1451 Northwest 46th Street
Seattle, Washington

Analyte	Analytical Method	Sample Container	Preservation	Holding Time
Soil Samples				
Arsenic	EPA 200.8	One 4-oz wide mouth glass	Cool 4°C	6 months
PAHs	SW-846 EPA 8270D SIMS	One 8-oz wide mouth glass	Cool 4°C	14/40 days[a]
DRPH	EPA 8015	One 8-oz wide mouth glass	Cool 4°C	14/40 days[a]
BTEX	EPA 8021B and EPA 5035A	Three - 40-mL VOA vials	Cool 4°C	14 days
Groundwater Samples				
Arsenic	EPA SW-846 Method 6000/7000 Series	One 500-mL poly bottle	Cool 4°C	6 months
PAHs	SW-846 EPA 8270C SIMS	One 500-mL amber bottle	Cool 4°C	7/40 days[b]
DRPH	EPA 8015	One 500-mL amber bottle	Cool 4°C	7/40 days[b]
BTEX	EPA 8021B and EPA 5035A	Three 40-mL VOA vials	Cool 4°C/HCL	14 days

NOTES:

[a] 14 days until extraction; 40 days following extraction.

[b] 7 days until extraction; 40 days following extraction.

°C = degrees Celsius
BTEX = benzene, toluene, ethylbenzene, and total xylenes
DRPH = diesel-range petroleum hydrocarbons
EPA = United States Environmental Protection Agency
HCL = hydrochloric acid preservative
mL = milliliter
oz = ounce
PAHs = polycyclic aromatic hydrocarbons
VOA = volatile organic analysis

Table I.2
Summary of Analytical Methods and Target Reporting Limits
Former Wesmar Property
1401 and 1451 Northwest 46th Street
Seattle, Washington

Analyte	Analytical Method	Target Reporting Limits		Site-Specific Cleanup Levels	
		Soil (mg/kg)	**Groundwater** (µg/L)	**Soil** (mg/kg)	**Groundwater** (µg/L)
Petroleum Hydrocarbons					
Diesel-Range Petroleum Hydrocarbons	NWTPH-Dx	50	50	2,000	500
Polycyclic Aromatic Hydrocarbons					
Naphthalene	EPA Method 8270-SIM	0.01	0.01	5	160
1-Methylnaphthalene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
2-Methylnaphthalene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Benzo(a)anthracene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Chrysene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Benzo(b)fluoranthene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Benzo(b)fluoranthene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Benzo(a)pyrene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Indeno(1,2,3-cd)pyrene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Dibenz(a,h)anthracene	EPA Method 8270-SIM	0.01	0.01	0.1	0.1
Volatile Organic Compounds					
Benzene	EPA Method 8260	0.03	0.03	0.03	5
Toluene	EPA Method 8260	0.05	0.05	7	1,000
Ethylbenzene	EPA Method 8260	0.05	0.05	6	700
Total Xylenes	EPA Method 8260	0.15	0.15	9	1,000
Naphthalene	EPA Method 8260	0.15	0.15	5	160
Trichloroethylene	EPA Method 8260	0.05	0.05	0.03	5
Metals					
Arsenic	EPA Method 200.8	1	1	20	5

NOTES:

EPA = United States Environmental Protection Agency

mg/kg = milligrams per kilogram

NWTPH = Northwest Total Petroleum Hydrocarbons

µg/L = micrograms per liter

ATTACHMENTS

Sample Chain of Custody Form
Sample Summary Form
Field Report Form
Groundwater Purge and Sample Form

SAMPLE CHAIN OF CUSTODY

Send Report To:

Company:

Address:

City, State:

Phone: Fax:

SAMPLERS *(signature)*

PROJECT NAME/NO.

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

						ANALYSES REQUESTED												
Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS							Notes

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:				

FORMS\COC\COC.DOC

Sample Summary Form

Project Name / Location: Project Number: Page of

Sample Name	Depth	Date	Time	Location	Soil Description

Additional Notes:

2400 Airport Way South, Suite 200
Seattle, Washington 98134-2020
P: (206) 306-1900 F: (206) 306-1907

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

FIELD REPORT

Project Number:

Page _____ of _____

Client / Project Title:

Date:

Location:

Time of Arrival/Departure:
_______________to _________________
(military time)

Purpose of Visit:

Prepared by:

Weather:

Travel Time:
Mileage:

Permit:

Upon arrival to the site I assessed personal safety hazards: ☐ Yes or ☐ Referred to Site Health and Safety Plan
Safety hazards were addressed by: ☐ Staying alert to construction and equipment hazards ☐ Other (describe

Notes:

Attachments:

Distribution:

This report presents opinions formed as a result of our observation of activities relating to our services only. We rely on the contractor to comply with the plans and specifications throughout the duration of the project irrespective of the presence of our representative. Our work does not include supervision or direction of the work of others. Our firm will not be responsible for job or site safety of others on this project. DISCLAIMER: Any electronic form, facsimile or hard copy of the original document (email, text, table, and/or figure), if provided, and any attachments are only a copy of the original document. The original document is stored by Sound Environmental Strategies Corporation and will serve as the official document of record.

Project No.
Page 2 of

SOUND ENVIRONMENTAL STRATEGIES
www.soundenvironmental.com

GROUNDWATER PURGE AND SAMPLE FORM

Client - Site: ______________ Project #: ________________ Well ID Number: _______________

Field/Sampling Personnel: ____

Date(s) of Water Level Measurement: Equipment Used: Product/Water Interface Meter

Total Depth	Depth to Water	Water Column	Casing Diameter (inches)			Casing Volume	Total Purge Volume
			2	4	6		
			0.16	0.64	1.44		

Date of Sampling:

Time of Sampling:

Water Quality Meter: Type_______________ SES #____________

Purge/Sampling Method: Low Flow other

Sampling Equipment: P.Pump, S.Pump , other _______________

Screened Interval: Approx. Depth at Sampling Point (*typically slightly above middle of screen*):

Time Start Purge: Time End Purge:

Time (in 3-5 min intervals)	Depth to Water (*drawdown <0.33'*)	Rate of Purging (Liter/min) 0.1 – 0.5	* pH ± 0.1	* Specific Conductivity (_____) ± 3%	* Turbidity (NTU) ± 10%	* Dissolved Oxygen (DO) ± 10% or < 0.2	Temperature (ºC) ± 3%	ORP ± 10mv

Sampling Comments:

Sample Number/ID	Container Type	Preservative	Field Filtration	Analysis Request

PURGE WATER DISPOSAL NOTES:

Total Discharge (3.8L:1Gal):	Disposal Method:

Well Head Conditions

Well/Security Devices in good condition? (i.e.: Monument, Bolts, Seals, J-cap, Lock) Yes No

Evidence of Surface Water Infiltration (if yes, describe)? Yes No

Action Items (e.g.: repair of any monitoring well components)? Yes No

Additional Comments/Descriptions/Explanation of any Access Issues:

- ** Indicates the minimum subset of parameters that must be met in lieu of measuring all five; pH, Conductivity,* ***AND****, Turbidity* ***OR*** *DO.*
- *Three successive readings should be within the indicated parameter limits prior to sampling*
- *All units of measurement are in feet and/or gallons unless otherwise indicated*
- *If prepurge static water level is above the screen, avoid drawdown of water level into the screen*
- *Final purge volume must be greater than stabilized drawdown volume plus extraction tubing volume*

GROUNDWATER PURGE AND SAMPLE FORM CONTINUED

Client - Site: ____________________ Project #: ____________________ Well ID Number: ______________________
Field/Sampling Personnel: ____
Water Quality Meter: Type________________ SES #____________
Purge/Sampling Method: Low Flow other Sampling Equipment: P.Pump, S.Pump , other

Screened Interval: Approx. Depth at Sampling Point (*typically slightly above middle of screen*):

Time Start Purge: Time End Purge:

Time (in 3-5 min intervals)	Depth to Water (*drawdown <0.33'*)	Rate of Purging (Liter/min) 0.1 – 0.5	* pH ± 0.1	* Specific Conductivity (______) ± 3%	* Turbidity (NTU) ± 10%	* Dissolved Oxygen (DO) ± 10%	Temperature (ºC) ± 3%	ORP ± 10mv

Sampling Comments:

APPENDIX J

Quality Assurance Project Plan

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Quality Assurance Project Plan
Appendix J of the Final RI Report, FS, and PCA

sound environmental strategies corporation

Property:

Former Wesmar Property
1401 & 1451 Northwest 46th Street
Seattle, Washington

Prepared for:

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Seattle, Washington

and

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January 19, 2010

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1.0 INTRODUCTION

This Quality Assurance Project Plan (QAPP) establishes the quality assurance (QA) objectives for soil and groundwater sampling associated with the remedial investigation at the Former Wesmar Property. Data collected under the program described in the Final Remedial Investigation Report, Feasibility Study, and Proposed Cleanup Action (Final RI Report, FS, and PCA) will be used to evaluate the effectiveness of the cleanup action proposed for the Property. This plan presents the quality control (QC) procedures developed to meet project QA objectives, as described below.

2.0 DATA QUALITY INDICATORS

Data quality indicators—including precision, accuracy, representativeness, comparability, and completeness (PARCC parameters)—and data reporting limits are dictated by the data quality objectives, project requirements, and intended uses of the data. The data must be of sufficient technical quality to assess whether contaminants are present and whether they pose a potential threat to human health and the environment.

An assessment of data quality is based upon quantitative (precision, accuracy, and completeness) and qualitative (representativeness and comparability) indicators. Definitions of these parameters and the applicable QC procedures are given below.

2.1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Analytical precision is measured through matrix spike/matrix spike duplicate (MS/MSD) samples and laboratory control samples/laboratory control sample duplicate (LCS/LCSD) for organic analysis and through duplicate samples for inorganic analyses.

Analytical precision is quantitatively expressed as the relative percent difference (RPD) between the LCS/LCSD, MS/MSD, or duplicates. Analytical precision measurements will be carried out at a minimum frequency of one per laboratory analysis group. Laboratory precision will be evaluated against laboratory quantitative RPD performance criteria provided by the laboratory.

Field precision will be evaluated by the collection of blind field duplicates at a minimum frequency of one in 20 groundwater samples. Control limits for the field duplicates will be 20 percent, unless the duplicate values are within five times the reporting limit, in which case the control limit interval will be plus or minus the reporting limit for groundwater.

Precision measurements can be affected by the nearness of a chemical concentration to the method detection limit, where the percent error (expressed as RPD) increases.

2.2 Accuracy

Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results is assessed by “spiking” samples with known standards (surrogates, blank spikes, or matrix spikes) and establishing the average recovery. Accuracy measurements on MS samples will be carried out at a minimum frequency of one in 20 samples per matrix analyzed. Surrogate recoveries will be determined for every sample analyzed for organics.

Laboratory accuracy will be evaluated against quantitative matrix spike and surrogate spike recovery performance criteria as provided by the laboratory. Accuracy can be expressed as a percentage of the true or reference value, or as a percent recovery in those analyses where reference materials are not available and spiked samples are analyzed. Control limits for percent recovery for soil and groundwater samples will equal the laboratory acceptance limits generated according to United States Environmental Protection Agency (EPA) guidelines.

2.3 Representativeness

Representativeness measures how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the matrix sampled. The sampling plan design, sampling techniques, and sample handling protocols (e.g., storage, preservation, and transportation) have been developed to ensure representative samples.

2.4 Comparability

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

2.5 Completeness

Completeness is defined as the percentage of measurements made that are judged to be valid measurements. Results will be considered valid if all the precision, accuracy, and representativeness objectives are met and if reporting limits are sufficient for the intended uses of the data. The target completeness goal for this project is 95 percent.

Laboratory internal QC checks, preventive maintenance, and corrective action, as described in other sections of this document, will be implemented to help meet the QA objectives established for these analyses.

3.0 FIELD AND LABORATORY QC PROCEDURES

This section describes the procedures that will be implemented to:

(1) Ensure sample integrity from the time of sample collection to the time of analysis in the laboratory.

(2) Obtain the appropriate chemical and physical data.

(3) Collect field and laboratory quality control samples.

(4) Monitor performance of the laboratory and field measurement systems.

(5) Correct any deviations from the methods or QA requirements established in this QAPP.

(6) Report and validate the data.

3.1 Field Equipment Calibration

Field meters used to evaluate pH, conductivity, and dissolved oxygen, as well as temperature probes and photoionization detectors, will be calibrated and maintained in accordance with the manufacturers' specifications. All routine maintenance will be recorded in the field sampling logs.

3.2 Field Documentation

As described in greater detail in the Sampling and Analysis Plan (SAP; Appendix I of the Final RI Report, FS, and PCA), a complete record of all field activities will be maintained for the duration of the field phase of the work. Documentation will include the following:

- Daily recordkeeping by field personnel of all field activities.
- Recordkeeping of all samples collected for analysis (field sampling forms).
- Use of sample labels and tracking forms for all samples collected for analysis.

The field logbooks and sample forms will provide a description of all sampling activities, sampling personnel, weather conditions, and a record of all modifications to the procedures and plans identified in the work plan. The field logbooks and sample forms are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during the sampling period.

Sample possession and handling will also be documented so that it is traceable from the time of sample collection to the laboratory and data analysis. Sample chain-of-custody records and procedures are described in Section 4.4 of the SAP (Appendix I of the Final RI Report, FS, and PCA).

3.3 Sample Handling Procedures and Transfer of Custody

Samples submitted to the analytical laboratories will be collected in the appropriate sample containers and preserved as specified in Tables I.1 and I.2 of the SAP (Appendix I of the Final RI Report, FS, and PCA). The storage temperatures and maximum holding times for physical/chemical analyses are also presented in Tables I.1 and I.2.

The transportation and handling of groundwater samples will be accomplished in a manner that not only protects the integrity of the sample, but also prevents any detrimental effects due to release of samples. Samples will be logged on a Sample Chain of Custody form and will be kept in coolers on ice until delivery to the analytical laboratory. The Sample Chain of Custody form will accompany each shipment of samples to the laboratory. Procedures for sample transportation and handling are described in Section 4.0 of the SAP (Appendix I of the Final RI Report, FS, and PCA).

3.4 Field and Laboratory QC Samples

Field and analytical laboratory control samples will be collected to evaluate PARCC parameters. A summary of the QC samples and the frequency at which they will be collected and/or analyzed is described in the following subsections.

3.4.1 Field Trip Blanks

Field trip blanks will consist of deionized water sealed in a sample container by the analytical laboratory. The trip blank will accompany sample containers for soil and groundwater samples during transportation to and from the field and then will be returned to the laboratory with each shipment of samples. The trip blank will remain unopened until submitted to the laboratory for analysis. One trip blank per cooler will be evaluated to identify the potential for sample contamination during transport.

3.4.2 Laboratory Matrix Spike

A minimum of one laboratory matrix spike per 20 samples, not including QC samples, or one matrix spike sample per batch of samples if fewer than 20 samples are obtained will be analyzed for all constituents. The matrix spikes will be performed using a project sample. These analyses will be performed to provide information on accuracy and to verify that extraction and concentration levels are acceptable. The laboratory spikes will follow EPA guidance for matrix and blank spikes.

3.4.3 Laboratory Matrix Spike Duplicate

A minimum of one laboratory matrix spike duplicate per 20 samples, not including QC samples, or one matrix spike duplicate sample per batch of samples if fewer than 20 samples are obtained will be analyzed for all constituents. These analyses will be performed to provide information on the precision of chemical analyses. The laboratory spikes will follow EPA guidance for matrix and blank spike duplicates.

3.4.4 Laboratory Method Blanks

A minimum of one laboratory method blank per 20 samples, one every 12 hours, or one per batch of samples analyzed if fewer than 20 samples are analyzed will be analyzed for all parameters to assess possible laboratory contamination. Dilution water will be used whenever possible. Method blanks will contain all reagents used for analysis. The generation and analysis of additional method, reagent, and glassware blanks may be necessary to verify that laboratory procedures do not contaminate samples.

3.4.5 Laboratory Control Sample

A minimum of one laboratory control sample per 20 samples, not including QC samples, or one laboratory control sample per sample batch if fewer than 20 samples are obtained will be analyzed for all parameters.

3.4.6 Surrogate Spikes

Surrogate spike recoveries will be reported with all organic reports where appropriate. The report shall also specify the control limits for surrogate spike results as well as the spiking concentration. Out of control recoveries (as defined in the Method Compendium) will be reported immediately to the Project QA Officer. Out of control recoveries (as defined in the Method Compendium) will result in the sample being rerun (Both sets of data are to be reported.).

3.5 Sample Analysis

Selected soil samples collected during the cleanup will be submitted for laboratory analysis, including DRPH by Northwest Total Petroleum Hydrocarbon Method NWTPH-Dx, PAHs by United States Environmental Protection Agency (EPA) Method 8270C SIM, arsenic by EPA Method 200.8, and BTEX and VOCs by EPA Method 8260B.

Standard EPA sample preparation, cleanup, and analytical methods will be used. Sample preparation methods, cleanup methods, and analytical methods are summarized in Section 4.0 of the SAP (Appendix I of the Final RI Report, FS, and PCA). The laboratory QAPPs and standard operating procedures will provide data quality procedures according to the protocols for the analytical method and cleanup steps, and at a level sufficient to meet the sampling program data quality objectives.

3.6 Reporting Limits

The reporting limits for each chemical analysis are summarized in Table I.2 of the SAP (Appendix I of the Final RI Report, FS, and PCA). These reporting limits are targeted to be lower than preliminary cleanup levels. The reporting limits listed are goals only. Instances may arise where high sample concentrations, non-homogeneity of samples, or matrix interferences preclude achieving the desired reporting limit and associated QC criteria. In such instances, the laboratory will report the reasons for deviations from these reporting limits.