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Critical Aquifer Recharge Areas Report

PENNY LANE II & III

Redmond, Washington

Prepared For:

ICHIJO USA CO., LTD.

Project No. 180106E001
April 17, 2019

Associated Earth Sciences, Inc.
911 5th Avenue
Kirkland, WA 98033
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April 17, 2019
Project No. 180106E001

Ichijo USA Co., Ltd.
15135 NE 90th Street, Suite 200
Redmond, Washington 98052

Attention: Mr. Randy Barnett

Subject: Critical Aquifer Recharge Areas Report
Penny Lane II & III
7960–7990 170th Avenue NE
Redmond, Washington

Dear Mr. Barnett:

We are pleased to present the enclosed copies of the referenced report. This report summarizes the results of our hydrogeologic assessment and "Critical Aquifer Recharge Areas Report."

We have enjoyed working with you on this study and are confident that the recommendations presented in this report will aid in the successful completion of your project. Please contact me if you have any questions or if we can be of additional help to you.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Curtis J. Koger, L.G., L.E.G., L.Hg.
Senior Principal Geologist/Hydrogeologist

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GENERAL INFORMATION
FOR CRITICAL AREAS REPORT

Proposal Name: Penny Lane II & III

Applicant Name: Ichijo USA Co., Ltd.

Report Prepared by: Associated Earth Sciences, Inc. (AESI). Curtis J. Koger of AESI is a licensed geologist, hydrogeologist, and engineering geologist in Washington State and has provided geologic and hydrogeologic services in Washington State since 1989.

Date Prepared: April 17, 2019

Site Location: See Figures 1 and 2. The projects include four parcels (Nos. 7792900-115, -125, -130, and -140) located at 7990, 7980, 7970, and 7960 170th Avenue NE, respectively, in Redmond, Washington.

Development Proposal: See Section 1.1

Description of Existing Site: See Section 1.1 and Figure 2

Drawings Showing Site Boundaries and Critical Areas: See Figures 2 and 3

Site Map: See Figure 2

Assumptions and Recommendations: See report

Bibliography: See Section 6.0

1.0 INTRODUCTION

This report presents the results of Associated Earth Sciences, Inc.'s (AESI's) Critical Aquifer Recharge Areas (CARA) evaluation for the proposed developments on the Penny Lane II & III properties. This hydrogeologic report was completed with an understanding of the projects based on information and plans provided by Ichijo USA Co., Ltd., prepared by the project civil engineer, Core Design, and on our work on the subject properties. As part of our current study, we have prepared a "Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report," dated April 16, 2019, for the properties (AESI, 2019). No previous environmental or geotechnical reports were identified for the subject sites.

1.1 Project Description

The Penny Lane II & III sites are located on four adjoining parcels. Tax Parcel Nos. 7792900-115 and -125 are located at addresses 7990 and 7980 170th Avenue NE, and Tax Parcel Nos. 7792900-130, and -140 are located at addresses 7970 and 7960 170th Avenue NE, Redmond, Washington. The locations of the sites are shown on the "Vicinity Map," Figure 1, and the "Site and Exploration Plan" is provided on Figure 2. Figure 2 is based on a figure entitled "Site Plan, Penny Lane II & III," (the Site Plan) by Core Design, the project civil engineer, dated April 2019. The site comprises 34,052 square feet in a mixed residential, commercial, and retail area east of the downtown area of the City of Redmond (City). The site is currently occupied by residences and small businesses with some on-site parking and typical residential landscaping. The properties are bounded to the west by 170th Avenue NE, to the north by NE 80th Street, to the south by Penny Lane Townhomes, and to the east across a paved alley by a four-story residential complex. According to the Site Plan, the current ground surface elevation across most of the site ranges from about 53 to 54 feet. The ground surface slopes up in the northeast corner of the site to an elevation of about 61 feet.

Based on our current understanding and review of available building plans, the proposed developments will consist of 18 single-family attached townhomes in two separate buildings. Parking is anticipated to be surface parking.

Review of the Site Plan indicates that the deepest excavations for the project will be the infiltration trenches and drywells. Currently proposed elevations of the bottoms of the infiltration facilities range from 45.35 to 49.12 feet.

We understand the foundations for the buildings will consist of conventional spread footings.

According to Core Design, stormwater from pollution-generating sources will be routed to the existing City storm drain that currently services the properties. To manage stormwater from

non-pollution-generating sources, the project will use downspout infiltration, utilizing a combination of infiltration trenches and dry wells distributed across the site (Figure 2).

1.2 Purpose and Scope

The purpose of this study was to evaluate hydrogeology of the site under existing conditions and for the proposed developments, and to prepare a CARA report, in accordance with *Redmond Zoning Code* [RZC] Appendix 1, Sections A and F, "Critical Areas Reporting Requirements," current as of 2019.

A Level 1 CARA is required for this site because it is located within Wellhead Protection Zone 1 for the City's Production Wells No. 1 and 2. The location of the site with respect to the City's Wellhead Protection Zones is shown on the map of "Well Locations and Wellhead Protection Zones," Figure 3. In addition, a Level 2 hydrogeologic assessment is required because the proposed developments will result in at least 5,000 square feet of impervious surfaces.

Our study included review of available geologic and hydrogeologic literature and assessment of geologic, groundwater, and soil conditions. AESI's subsurface exploration completed at the site included advancing four hollow-stem auger soil borings (EB-1 through EB-4), and ten exploration pits (EP-1 through EP-10) in support of the geotechnical engineering study (AESI, 2019). Copies of exploration logs are included in Appendix A.

AESI reviewed several documents related to groundwater data for City monitoring and production wells. These documents include reports prepared by GeoEngineers (2010a, 2010b, 2011a, 2011b, 2013, and 2015), Golder Associates (2016a, 2016b, 2017a, and 2017b, 2018a, 2018b), a wellhead protection report (Parametrix et al., 1997), reports on the drilling and testing of replacement Production Wells Nos. 1R and 2R, generally referred to as Well No. 1 and Well No. 2 (Golder, 2003a and 2003b), and data tables provided by the City. The full references of the reports and data reviewed are listed in Section 6.0 of this report.

AESI also reviewed monitoring well logs and water well reports within 1,300 feet of the site obtained from the above-referenced sources as well as the Washington State Department of Ecology (Ecology). Additionally, AESI reviewed water quality results for wells located within 1,300 feet of the site obtained from the City, Washington State Department of Health (DOH) - Office of Drinking Water (ODW) (Appendix B), and water quality data associated with environmental cleanup activities in the vicinity of the site (Appendix D).

CARA Requirement	Report Section
The requirements of a Level 1 CARA report include:	
Available information regarding geologic and hydrogeologic characteristics of the site, including the surface location of all critical aquifer recharge areas located onsite or immediately adjacent to the site, and permeability of the unsaturated zone.	Sec. 3, Figs. 3-5
Groundwater depth, flow direction, and gradient based on available information.	Sec. 3.3, Fig. 5, App. C
Currently available data on wells and springs within 1,300 feet of the project area.	Sec 3.4, Figs 3, 5, App. A
Locations of other critical areas, including surface waters, within 1,300 feet of the project site.	Fig. 3
Available historical water quality data for the area to be affected by the proposed activity.	Secs. 3.6, 3.7, App. B
Best management practices (BMPs) proposed to be utilized.	Secs. 4.1 - 4.4
The requirements of a Level 2 hydrogeologic assessment include:	
Historical water quality data for the area to be affected by the proposed activity compiled for at least the previous 5-year period.	Secs. 3.6, 3.7, App. B
Groundwater monitoring plan provisions.	Sec. 4.0
Discussion of the effects of the proposed project on the groundwater quality and quantity, including:	
Predictive evaluation of groundwater withdrawal effects on nearby wells and surface water features.	Sec. 4.1
Predictive evaluation of contaminant transport based on potential releases to groundwater.	Sec. 4.2
Predictive evaluation of groundwater (recharge, elevation, dewatering feasibility, constructability, discharge permitting, etc.) on the proposed project.	Sec. 4.1
Identification of the type and quantities of any deleterious substances or hazardous materials that will be stored, handled, treated, used, produced, recycled, or disposed of on the site, including, but not limited to materials such as elevator lift/hydraulic fluid, hazardous materials used during construction, materials used by the building occupants, proposed storage and manufacturing uses, etc.	Secs. 4.4, 4.5
Proposed methods of storing any of the above substances, including containment methods to be used during construction and/or use of the proposed facility.	Sec. 4.4
Proposed plan for implementing protection standards during construction.	Sec 4.3
A spill plan that identifies equipment and/or structures that could fail, resulting in an impact. Spill plans shall include provisions for regular inspection, repair, and replacement of structures and equipment that could fail.	Sec. 4.4, App. E
A complete discussion of past environmental investigations, sampling, spills, or incidents that may have resulted in or contributed to contaminated soil or groundwater at the site. Attach copies of all historical and current reports, and sampling results.	Secs. 3.7, 4.0, App. D

1.3 Authorization

Authorization to proceed with this study was granted by Mr. Randy Barnett of Ichijo USA Co., Ltd. Our study was accomplished in general accordance with our proposal, dated March 7, 2018, and our Change Order Request, dated March 20, 2019. This report has been prepared for the exclusive use of Ichijo USA Co., Ltd. and their agents for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted hydrogeologic practices in effect in this area at the time our report was prepared. No other warranty, express or implied, is made.

1.4 Summary of Findings

The proposed developments will include the demolition of existing houses and associated outbuildings and appurtenances, and construction of 18 at-grade, row-house-style townhomes in two separate buildings. Underground parking is not being proposed for the developments. We anticipate maximum excavation depths will be achieved in the downspout infiltration drywells, currently proposed to be approximately 10 feet below current ground surface. Seasonally high groundwater is estimated to be approximately 21 to 23 feet below ground surface (bgs) (approximate elevation 32 feet), based on historical water level data from nearby City monitoring wells (Appendix C).

On-site explorations and nearby well logs indicate that the subject properties are underlain by structural fill and younger Holocene alluvial deposits. The alluvial deposits are interpreted to be underlain by Vashon recessional outwash, which is interpreted to be underlain by pre-Fraser undifferentiated deposits (Appendix A, Figure 6).

The project will manage stormwater in accordance with the City's *Stormwater Technical Notebook 2019 - Issue 8* (2019 SWTN) and Ecology's 2012 *Stormwater Management Manual for Western Washington* as amended in 2014 (2014 SWMMWW). Preliminary drainage design indicates that stormwater from pollution-generating sources will be conveyed to the existing City stormwater service as required by the City's 2019 SWTN. To manage stormwater from non-pollution-generating sources, the project will use Best Management Practices (BMPs) from the 2014 SWMMWW as required by the City's 2019 SWTN.

City Wells No. 1R and No. 2R are located approximately 450 and 530 feet west-southwest, respectively, of the southwest corner of the subject site. Eleven City groundwater monitoring wells were identified within the 1,300-foot search radius.

The project is required to implement BMPs for stormwater to maintain beneficial uses to groundwater and stormwater resources. Provided proper housekeeping and spill control practices are implemented during construction and subsequent use, it is AESI's opinion that

none of the wells within 1,300 feet of the site will be adversely impacted by the proposed improvements and no significant adverse impacts to water quality in the alluvial aquifer have been identified.

2.0 METHODOLOGY

2.1 Data Review

AESI reviewed available soil, groundwater, and geologic data to gain an understanding of existing conditions in the study area. Information reviewed included the following:

- AESI's "Subsurface Exploration, Geologic Hazard, and Geotechnical Engineering Report," (AESI, 2019).

- Previous reports and maps prepared by AESI for nearby properties, including geologic and groundwater studies for: Redmond 160th Avenue Senior Housing project (AESI, 2014a), Village Square Apartments (AESI, 2014c), Redmond Elementary School (AESI, 2015a) and Redmond Mixed Use (AESI, 2017), located northwest of the site; and The Carter (AESI, 2014b), The Heron (AESI, 2015b), and Bear Creek (AESI, 2015c), located southwest of the site.

- Reports and maps published by the United States Geological Survey (USGS), the Washington State Department of Natural Resources (WDNR) Division of Geology and Earth Resources, the King County Office of Drinking Water (ODW), and Ecology.

- City of Redmond Wellhead Protection Program documents and data.

- Well logs obtained from the online Ecology and King County databases;

- DOH-ODW and City water quality data.

Selected citations for documents used during this study are listed in Section 6.0.

2.2 Field Studies

AESI performed subsurface exploration borings on the site on March 28 and 29, 2018, and exploration pits on April 21, 2018 and February 28, 2019. Our field study included four hollow-stem auger borings, and ten exploration pits. The locations of the explorations are shown on Figure 2. The various types of materials and sediments encountered in the explorations, as well as the depths where characteristics of these materials changed, are indicated on the exploration logs presented in Appendix A of this report.

2.3 Hydrogeologic Analysis

Groundwater characteristics evaluated for the site vicinity included hydrostratigraphy, depth to water, seasonal fluctuations, aquifer flow direction, sources of recharge, and discharge points. Our analysis also included review of available water quality information from wells located within 1,300 feet of the site and an evaluation of potential impacts to groundwater quality and quantity from the proposed redevelopment project.

2.3.1 Well Log Review

Ecology, DOH-ODW, and King County online well log databases were reviewed to obtain available water wells logs within 1,300 feet of the site. Well location and construction information was also obtained from the City's Wellhead Protection Program reports. The approximate locations of City wells within the 1,300-foot radius and surrounding vicinity are shown on Figure 3. The databases did not show any water supply well logs other than the City wells within the 1,300-foot radius. Due to the abundance of high quality data from the City, logs for non-City off-site resource protection wells are not included with this report. Available logs for City wells located within 1,300 feet of the site are provided in Appendix A.

2.3.2 Water Quality Analysis

The water quality analysis included an evaluation of available water quality information from the City's monitoring wells located within 1,300 feet of the site and City Production Wells No. 1R and 2R, located approximately 450 and 530 feet west-southwest of the southwest site corner. Water quality criteria exceedances and recent water quality data for on-site and nearby wells are provided in Appendix B.

The evaluation of potential impacts included: identification of likely deleterious substances or hazardous materials that will be used, stored, or disposed of onsite during site development activities; likely BMPs that will be implemented to prevent degradation of groundwater quality; and any adverse impacts to water quantity from changes in recharge and water quality from potential releases to groundwater.

3.0 EXISTING CONDITIONS

3.1 Physical Setting and Topography

The site is located in Redmond, Washington (Figure 1), southeast of the intersection of 170th Avenue NE and NE 80th Street, and about 1½ miles northwest of Lake Sammamish. The topography of the site is relatively flat and site elevations range from 53 to 61 feet,

with the majority of the site being around elevation 53 feet, according to the Site Plan (Core, 2019). The site topography, and existing and proposed site features are shown on the "Site and Exploration Plan," Figure 2.

The site and surrounding vicinity are located in the Sammamish River valley, which is bounded to the east and west by broad upland plateaus. Topographic features in the vicinity of the site were formed by glacial and post-glacial processes. The Sammamish River emanates from Lake Sammamish and flows north through Marymoor Park and the downtown area of Redmond. Bear Creek joins the Sammamish River north of Marymoor Park.

3.2 Regional and Site Geology

Our interpretation of the geologic and hydrogeologic conditions in the vicinity of the site is based on a review of selected information in the available literature, water well reports for wells located in the surrounding area, and our experience on similar projects in the site vicinity. Figure 3 shows the approximate locations of water wells and City monitoring wells in the vicinity of the site. A surface geologic map of the site vicinity, adapted from Booth et al. (2007), is shown on the map of "Surface Geology," Figure 4. The "Groundwater Elevation Contour Map," Figure 5, shows groundwater elevations in the alluvial aquifer in the vicinity of the site, and Figure 6 presents a generalized hydrogeologic cross-section of the site and vicinity, and includes data from the City's nearby monitoring wells and water supply Wells 1R and 2R.

The site is underlain by younger, Holocene (Quaternary) alluvium (*Qal*). The alluvium underlying the site was deposited by the Sammamish River system. Landslide deposits, alluvial fan deposits, older alluvium, Vashon glacial sediments (recessional and advance outwash, and lodgement till), and pre-Fraser undifferentiated non-glacial and glacial deposits are mapped in the general vicinity of the site (Figure 4). Varying thicknesses of fill soils often overlie the surficial deposits.

Onsite, below surficial fill and/or pavement, AESI's deepest boring encountered loose to medium dense sand and gravel extending to a depth of 23 feet. We interpret these sediments to be representative of alluvium deposited during the Holocene geologic time period (approximately 11,700 years ago to the present). The Holocene alluvium is underlain by hard silt interpreted to be pre-Fraser-aged silt (Qpf). Regionally, the deposition of the pre-Fraser-aged sediments occurs both glacially and non-glacially. The unit, therefore, is referred to as pre-Fraser, undifferentiated. The presence of dropstones within the pre-Fraser silts in on-site boring EB-1 indicates glacially derived sediments in the vicinity of EB-1.

Vashon recessional outwash is interpreted to directly underlie the younger Holocene alluvium in the site vicinity, but may be absent locally. The contact between the alluvium and the

underlying Vashon recessional outwash is difficult to ascertain from soil boring samples, due to their similar physical appearance.

The interpreted subsurface stratigraphy of the site is in general agreement with that presented in the City of Redmond "Wellhead Protection Report, Redmond, Washington" (Parametrix et al., 1997) and other published geologic maps for the area, including the *Geologic Map of the Redmond Quadrangle, Washington* (Minard and Booth, 1988), and the *Geologic Map of Redmond Bear Creek Area, King County, Washington* (Booth et al., 2007). Similar stratigraphic sequences have been identified in previous hydrogeologic evaluations by AESI in the project vicinity (AESI, 2014a to 2014c, 2015a to 2015c, and 2017).

3.3 Regional and Site Hydrogeology

The site and surrounding vicinity are underlain by a regional unconfined aquifer located within the surficial alluvium and Vashon recessional outwash deposits within the Sammamish Valley, referred to as the "alluvial aquifer." The alluvial aquifer is the primary water supply source for the City's production wells. All of the City monitoring wells within 1,300 feet of the site are interpreted to be completed within the alluvial aquifer. A summary table of water level data provided by the City, and groundwater hydrographs for City of Redmond monitoring wells within the 1,300-foot search radius is included in Appendix C. The following is a summary of the alluvial aquifer characteristics in the immediate vicinity of the site:

- The alluvial aquifer is unconfined and generally comprised of fine-grained sand, silt, clay, and organic matter, grading at depth to clean sand and gravel (Parametrix et al., 1997). The alluvial aquifer deposit is typically about 70 feet thick, with the intervals of higher transmissivity averaging about 30 feet thick. The alluvial aquifer is interpreted to be underlain by over 200 feet of clay, which likely corresponds to pre-Fraser non-glacial and glacial sediments. This deposit forms the base of the alluvial aquifer (Parametrix et al., 1997).

- The upland areas surrounding the Sammamish Valley, including the upland immediately north of the site, form lateral boundaries that constrain groundwater flow within the alluvial aquifer.

- The alluvial aquifer thins near the lateral boundaries; based on AESI's exploration boring (EB-1), completed near the northeast corner of the site, the base of the alluvial aquifer is in the range of 23 feet bgs (approximate elevation 30 feet).

- The alluvial aquifer is interpreted to be hydraulically connected to area surface water features.

- The alluvial aquifer is primarily recharged by the direct infiltration of precipitation and by groundwater through-flow from the upgradient portion of the surficial aquifer. The total estimated groundwater recharge to the alluvial aquifer from precipitation is estimated to be 26 inches per year in the immediate vicinity of the site (Parametrix et al., 1997).

- The depth to groundwater in the alluvial aquifer is variable. Based on water level data from the City's monitoring wells, the groundwater elevations range from seasonal lows of approximately 24 feet (summer) to seasonal high elevations around 32 feet (winter) in the site vicinity (Appendix C).

- Based on information provided in the City's "Wellhead Protection Report," the transmissivity of the alluvial aquifer is highly variable, ranging from about 5,300 to 105,000 square feet per day (ft^2/d) (Parametrix et al., 1997).

- Regional groundwater flow in the alluvial aquifer is generally parallel to the ancestral and recent streams and rivers that deposited the outwash and alluvium. As shown on Figure 5, groundwater in the alluvial aquifer beneath the site flows generally from east-southeast to west-northwest at an average gradient of about 15 feet per mile.

Based on the information obtained to date, the principal shallow groundwater regime beneath the site and immediate vicinity is the alluvial aquifer. The groundwater contours shown on Figure 5 are interpreted based on water level data collected during the City of Redmond's Winter 2018 water level monitoring event, which occurred on January 30, 2018, and represents seasonal high water levels (Golder, 2018a). The hydraulic gradient and groundwater flow direction appear to be similar in the summer and in the winter.

The nearest well for which semi-continuous long-term water level data are available is City Monitoring Well MW009, located about 660 feet southwest and hydraulically downgradient of the southwest corner of the site (Figure 3). Based on continuous and manual data from 2013 through 2018, groundwater elevations in MW009 typically range from about 25 feet in the summer to 31 feet in the winter. Short-term peak groundwater elevations can rise up to about 32 feet in response to high-precipitation storm events. Based on groundwater contour maps provided by Golder (2016a, 2016b, 2017a, and 2018a), water levels in MW009 may be slightly lower than groundwater beneath the project site; however, seasonal fluctuations are likely representative of conditions beneath the project site. A summary of City monitoring well water levels in the vicinity of the site is included in Appendix C.

Based on our analysis of long-term water level data from the City monitoring wells, AESI extrapolates a seasonal high groundwater level of up to 32 feet elevation (21 feet bgs) with short-term peaks up to 33 feet elevation at the project site. Seasonal low water levels generally

occur between May and October (dry season). Dry season water levels are expected to be around 26 feet elevation (27 feet bgs) at the project site. Figure 6 presents a generalized cross-section showing anticipated maximum excavation depths of proposed infiltration drywell/trench systems on the site in relationship to groundwater elevation, and City monitoring and water supply wells in the vicinity of the site. The groundwater elevations depicted on Figure 6 are based on Golder 2018a.

3.4 Summary of Nearby Well Systems

We identified twelve City-owned monitoring wells, and two City-owned water supply wells (Well No. 1R and Well No. 2R) located within 1,300 feet of the site (Figure 3). No other Group A or Group B water systems were identified within the search radius. Available water supply well logs obtained from the City are provided in Appendix A. Well logs from non-City off-site shallow resource protection wells are on file with Ecology. However, due to the generally poor quality of the data associated with these wells and the abundance of high quality data from the City, logs for off-site non-City resource protection wells are not included in this report.

3.4.1 Group A Water Supply Wells

City of Redmond water supply wells 1R and 2R are located approximately 450 and 530 feet west-southwest of the southwest site corner (Figure 3). Original wells 1 and 2 were replaced by new wells in 2003 (Golder, 2003a and 2003b). According to the City, the original wells were abandoned. The site is located within the 6-month time of travel radius for City Production Wells No. 1R and No. 2R. The other three City of Redmond water supply wells (Wells No. 3, No. 4 and No. 5) are located well outside a 1,300-foot radius from the site. No adverse impacts to these wells would occur due to the proposed work at the project site provided that approved stormwater conveyance systems are properly constructed and temporary construction phase impacts are mitigated in accordance with City requirements. The well logs for City Production Wells No. 1R and No. 2R are included in Appendix A.

3.4.2 City of Redmond Monitoring Wells

Twelve City groundwater monitoring wells were identified within a 1,300-foot radius of the properties (Figure 3). These wells, identified as MW008 through MW014, MW052, MW329, MW340, MW342, and MW371, are used to monitor water quality and/or water levels in the alluvial aquifer. MW014, MW371 and MW329 are located upgradient of the site but based on contours developed by Golder (2019), the down-valley flow path would be south of the site (Figure 5). Only wells MW008 and MW340 are likely located downgradient of the flow paths originating from the site. The remaining wells are located cross-gradient to the south to southwest from the site. The City provided water level measurements collected at least twice annually in nine wells from July 2013 to August 2018 (Figure C1 and Table C1), and one

winter water level measurement from each well, collected in January 2018 (Table C2). In addition, historical water level data includes continuous water level measurements for the above period of record in MW009, beginning in March 2014 in MW342, beginning in March 2016 in MW013, and in about 6- to 9-month increments beginning in January 2015 in well MW014. Water quality data provided to AESI were collected twice annually from each well.

3.4.3 Domestic Water Wells and Group B Water Supply Wells

No domestic water wells or Group B water supply wells were identified within the 1,300-foot search radius from the site in either the Ecology database or the DOH database. Domestic water for all properties within 150 feet of the site is provided by City of Redmond.

3.4.4 On-Site Resource Protection Wells

No resource protection wells were encountered on the site. AESI advanced four soil borings on the site. The planned depth of the borings was 30 bgs. One of the borings reached the planned depth, and the other boring depths ranged from 7 to 13 feet bgs, due to difficult, cobbly drilling conditions. Monitoring wells were not installed. Additionally, AESI completed ten exploration pits on the site to maximum depths of 16 feet bgs.

3.4.5 Temporary Dewatering Wells

No well logs were identified for dewatering on file with Ecology within the 1,300-foot radius of the site. However, several dewatering sites are present just outside the 1,300-foot radius to the west. All dewatering well logs identified were dated 2012 and earlier, and are presumed to be decommissioned. Decommissioning reports were found for some of these wells. Due to the age of the wells, it is presumed that they have been decommissioned.

3.5 Surface Water Features

The Sammamish River is located approximately $^{2}/_{3}$ mile southwest of the site and flows to the north. Bear Creek is located approximately ¼ mile southeast of the site and flows south and west toward the confluence with the Sammamish River. Lake Sammamish is located approximately 1½ miles southeast of the project site.

3.6 Groundwater Quality

In order to establish the existing conditions of groundwater quality at the site, water quality records obtained from the City, King County, and DOH-ODW were searched and compiled to identify available water quality information for water supply and resource protection wells located within 1,300 feet of the site. The City's consultant conducts scheduled, periodic

groundwater sampling and provides the data to the City in semi-annual sampling reports. The latest such report is the "Summer 2018 Groundwater Monitoring Event City of Redmond Wellhead Protection Program," dated October 25, 2018, by Golder Associates (Golder, 2018b). The City also provided water quality data for nearby monitoring well MW052, which is not included in the monitoring report, and soil and groundwater contaminant information for a historic dry cleaner site (Overlake Cleaners) located a block southwest of the site. Based on the confirmed release at Overlake Cleaners, water quality results for volatile organic compounds in the City's water supply wells (1R and 2R) were obtained from the DOH-ODW database from the three available sample dates: July 6, 2009, July 17, 2013, and July 11, 2016. Concentrations of tetrachloroethylene (PCE) and its daughter products were below method detection limits for the three sample events.

A summary of constituents and water quality parameters that exceeded applicable regulatory criteria (Ecology criteria established in Chapter 173-200 of the *Washington Administrative Code* [WAC] and DOH maximum contaminant level (MCL) values established in Chapter 246-290 WAC) is provided below. Water quality data are provided in Appendix B, including the two most recent sampling events of City monitoring wells (Golder, 2018a and 2018b), and a list of exceedances in City monitoring wells within 1,300 feet of the site, and water quality data for City Wells No. 1R and No. 2R.

- **Arsenic:** Arsenic was detected at concentrations of 6.9 to 190 micrograms per liter (µg/L) in samples from MW012, MW014 and MW052. Concentrations were above Ecology Method A regulatory criterion of 5 µg/L and the DOH MCL of 10 µg/L.

- **Metals:** Iron and/or manganese were detected at concentrations exceeding regulatory criteria in seven of the monitoring wells located within 1,300 feet of the site (MW008, MW009, MW010, MW012, MW013, MW014, and MW052).

- **pH:** Values of pH lower than the Ecology-specified range of 6.5 to 8.5 have been reported for seven monitoring wells (MW008, MW009, MW010, MW011, MW013, MW014, and MW052) located within 1,300 feet of the site.

- **Tetrachlorothylene (PCE):** Trace levels of PCE, below the Ecology Method A cleanup level of 5.0 µg/L, were detected in one well (MW052) at concentrations ranging from 0.23 to 2.8 micrograms per liter (µg/L) between 1997 and 2007. The most recent sampling data, from February and July 2009, did not exhibit concentrations of PCE above the method detection limit. This sampling was conducted in response to the confirmation of a release at Overlake Cleaners, adjacent and immediately down-gradient of MW052 (See section 3.7.2). PCE was not detected in samples from City water supply wells 1R and 2R reviewed on the DOH-ODW database.

3.7 Historical Environmental Investigations and Land Use

3.7.1 Historical Environmental Investigations and Land Use - Subject Site

According to information provided by Ichijo USA Co., Ltd., no past environmental or geotechnical studies have been performed for the site. Records reviewed on King County iMap (https://gismaps.kingcounty.gov/iMap/) extend back to 1982 for all four parcels, and a former homeowner provided information about residence ownership "prior to 1985." In addition, the earliest aerial photos in Google Earth show the four parcels occupied by essentially the same configuration of houses since 1990.

3.7.2 Historical Environmental Investigations and Land Use - Off-Site Properties

3.7.2.1 Overlake Cleaners

The City provided an environmental report dated July 12, 2007, by Environmental Associates, Inc. (EAI, 2007), titled, "Soil & Groundwater Sampling & Testing," for Overlake Cleaners, located approximately one block south of the site, at 16940 NE 79th Street. A copy of this report is included in Appendix D. Fieldwork for this report included soil borings on the property around the former dry cleaning machine. This work followed the discovery by the City of Redmond that "Redmond Municipal Wells 1 and 2 in Anderson Park have been picking up tetrachloroethylene (PCE) a dry cleaning solvent in municipal well pumpage since August 1996. Levels are currently around 3.5 ppb (parts per billion). There is a suspected source dry cleaners (Overlake) directly across 79th Street from the well houses in the park." As indicated in the EAI report, Ecology conducted an "Initial Investigation at and around Anderson Park including Overlake Cleaners" in October 1996 in an effort to identify possible sources of PCE contamination detected in groundwater pumped from the City's municipal water wells in Anderson Park. PCE concentrations in soil samples collected around the dry cleaning machine and associated appurtenances at Overlake Cleaners revealed PCE concentrations ranging from 50 to 997 ppb, which are at or above the current cleanup standard for PCE in soil. Based on EAI's exploration and testing, they concluded at the time of their assessment, that PCE contamination associated with Overlake Cleaners was limited to shallow surface soils, and was not present in groundwater in the two on-site wells or in a grab sample from one of their soil borings.

The Ecology Toxics Cleanup Program's Cleanup Site Details, included in Appendix D, lists the site status as "Cleanup Started," and indicates the site is listed on the Hazardous Sites Listing/NPL as of February 1997. The report also indicates groundwater and soil as affected media with halogenated organics confirmed, and metals priority pollutants as suspected in soil.

3.7.2.2 Other Off-Site Environmental Data

The DOH's Source Water Assessment Program (SWAP) is a portal for accessing Group A and Group B water system data, and it also provides links to site cleanup data contained in Ecology's databases. The Ecology Toxics Program's Cleanup Site Details were reviewed for active cleanup sites within 1,300 feet of the subject site. Five sites were identified with Cleanup Site Details keyed to their Facility Site ID. All five sites are listed with a status of "NFA," or no further action required. A table showing the five sites, and their respective Cleanup Site Details data sheets are included in Appendix D.

4.0 GROUNDWATER QUANTITY AND QUALITY IMPACTS AND MITIGATION

The following sections summarize potential impacts to groundwater quantity and quality in the alluvial aquifer beneath the site and to nearby surface water as a result of the proposed Penny Lane II project. Planned mitigation efforts to minimize any potential adverse impacts to the aquifer are also described.

The Penny Lane II & III project proposes to avoid significant adverse impacts to downgradient water resources by implementing required stormwater management controls in accordance with the 2014 SWMMWW (Ecology, 2014), the City's 2019 SWTN (Redmond, 2019), and *Redmond Municipal Code*. According to the City's 2019 SWTN, the project is located in Wellhead Protection Zone 1, a flow control exempt area, and the Downtown Regional Facility Surcharge Area. Therefore, stormwater from pollution-generating sources may not be infiltrated and will be routed to the existing City storm drainage system. The proposed modern stormwater management controls for non-pollution-generating sources described in the following sections of this report are considered BMPs for maintaining groundwater recharge, and mitigating water quality impacts to groundwater in accordance with Chapter 173.200 WAC and the stormwater manuals.

4.1 Water Quantity Considerations

Preliminary drainage design indicates that stormwater from pollution-generating sources will be conveyed to the existing City stormwater service as required by the City's 2019 SWTN.

To manage stormwater from non-pollution-generating roof areas, the project will use the following BMP from the 2014 SWMMWW as required by the City's 2019 SWTN: BMP T5.10A: Downspout Full Infiltration. Use of the prescribed BMP will maintain groundwater recharge in the built condition of the proposed project.

Based on the available data, the project site does not lie within the 100-foot sanitary control radius of any public or domestic water supply wells. The closest water supply well is City Production Well No. 1R, located approximately 450 feet downgradient of the site.

No groundwater withdrawal is proposed with the project during construction or in the built condition. Therefore, no significant adverse project-related withdrawal effects on nearby wells and surface water features have been identified.

4.2 Water Quality Considerations

4.2.1 Potential Water Quality Impacts - Built Condition

Per the City's 2019 SWTN, stormwater from pollution-generating sources will be routed to the existing City storm drain. To manage stormwater from non-pollution-generating sources, the project will use BMP *T5.10A: Downspout Full Infiltration* from the 2014 SWMMWW as required by the City's 2019 SWTN. Use of the prescribed BMPs will be protective of groundwater quality in the built condition of the proposed project.

4.2.2 Construction-Related Potential Water Quality Impacts

During construction, pollutants generated from on-site stormwater have the potential to migrate off-site via surface runoff or by infiltration to groundwater. Potential pollutants generated during construction include suspended solids and trace petroleum hydrocarbons in on-site stormwater. Suspended solids during construction (including heavy metals in a particulate form) are generally removed by filtration within several inches of the ground surface. Heavy metals in the dissolved form are strongly sorbed to soil particles and do not typically migrate more than several inches through the soil column. It is unlikely that any incidental stormwater infiltration that occurs onsite during construction will transport suspended solids or dissolved metals to the alluvial aquifer. It is AESI's opinion that groundwater and surface water features would not be adversely impacted during construction activities. A construction Spill Prevention and Response Plan is included as Appendix E.

4.3 Construction Erosion Hazard Best Management Practices

Care must be taken during construction to avoid adversely impacting any permanent stormwater control or treatment facilities with untreated construction stormwater and silt. Therefore, a properly developed, constructed, and maintained erosion control plan consistent with City of Redmond standards and best management erosion control practices will be required for the project. Proposed erosion and sediment control measures include a sediment fence around the site, and inlet and catch basin protection. Any potential adverse impacts from erosion hazards on the project should be mitigated with the proper implementation of the

temporary erosion and sediment control (TESC) plans, and by field-adjusting appropriate mitigation elements (BMPs) throughout construction as recommended by the erosion control inspector.

4.4 Spill Prevention and Response

Hazardous materials that will potentially be stored onsite during construction of the proposed project may include gasoline, diesel, hydraulic fluid, machine oil, and/or propane. It will be the contractor's responsibility to ensure that all hazardous materials handling is performed within City of Redmond standards. A Spill Prevention and Response Plan will be developed in accordance with the City of Redmond Protection Standards During Construction (RZC 21.64.050.D.3.f).

4.4.1 General Hazardous Material Storage and Spill Prevention

- Ensure all hazardous substances are properly labeled.
- Store, dispense, and/or use hazardous substances in a way that prevents releases.
- Provide secondary containment when storing hazardous substances in bulk quantities greater than approximately 55 gallons.
- Maintain good housekeeping practices for all chemical materials at the site.
- Any leaks from construction equipment will be repaired off-site before the equipment is used again onsite.
- In general, most of the hazardous or deleterious substances stored onsite will be in minimal quantities and stored in small containers, such as 5-gallon gasoline cans. Large volume spills are not anticipated during site construction activities.

4.4.2 Spill Containment

- The general spill response procedure at this site is to stop the source of the spill, contain any spilled material and clean up the spill in a timely manner to prevent accidental injury or other damage.
- It will be the contractor's responsibility to provide secondary containment for hazardous materials stored onsite, and vehicle fueling during construction.
- Small incidental spills will be contained by site personnel if they are able to do so without risking injury. Spill kits will be located at the job site safety office.

4.4.3 Emergency Procedures

- Immediately call **911** in the event of injury, fire or potential fire, or spill of a hazardous substance that gives rise to an emergency situation.
- Spill cleanup for large spills should be handled by a designated Spill Cleanup Contractor.

4.5 Description and Management of Deleterious Substances and Hazardous Materials

As specified in RZC Appendix 1, Sections A and F, the Level 2 hydrogeologic assessment must identify any deleterious substances and hazardous materials that will be stored, handled, treated, used, produced, recycled, or disposed of onsite. Additionally, if necessary, the assessment shall specify methods of storing and handling these substances and provide a spill plan. The proposed project consists of construction of 18 row-house-style townhomes in two separate buildings with surface parking, as such storage and usage of deleterious substances and hazardous materials is not expected to be significant. Therefore, specifics regarding storage and handling of these types of materials to minimize potential impacts to groundwater quality is not warranted at this time. Storage of hazardous materials to be used during construction is discussed above in Section 4.4.

5.0 CLOSURE

We have enjoyed working with you on this study and are confident these recommendations will aid in the successful completion of your project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

State of Washington
Hydrogeologist
1074
Licensed Geologist
Stanley S. Thompson

4-26-2019

Curtis J. Koger, L.G., L.E.G., L.Hg.
Senior Principal Geologist/Hydrogeologist

Stanley S. Thompson, L.G., L.Hg.
Senior Project Geologist

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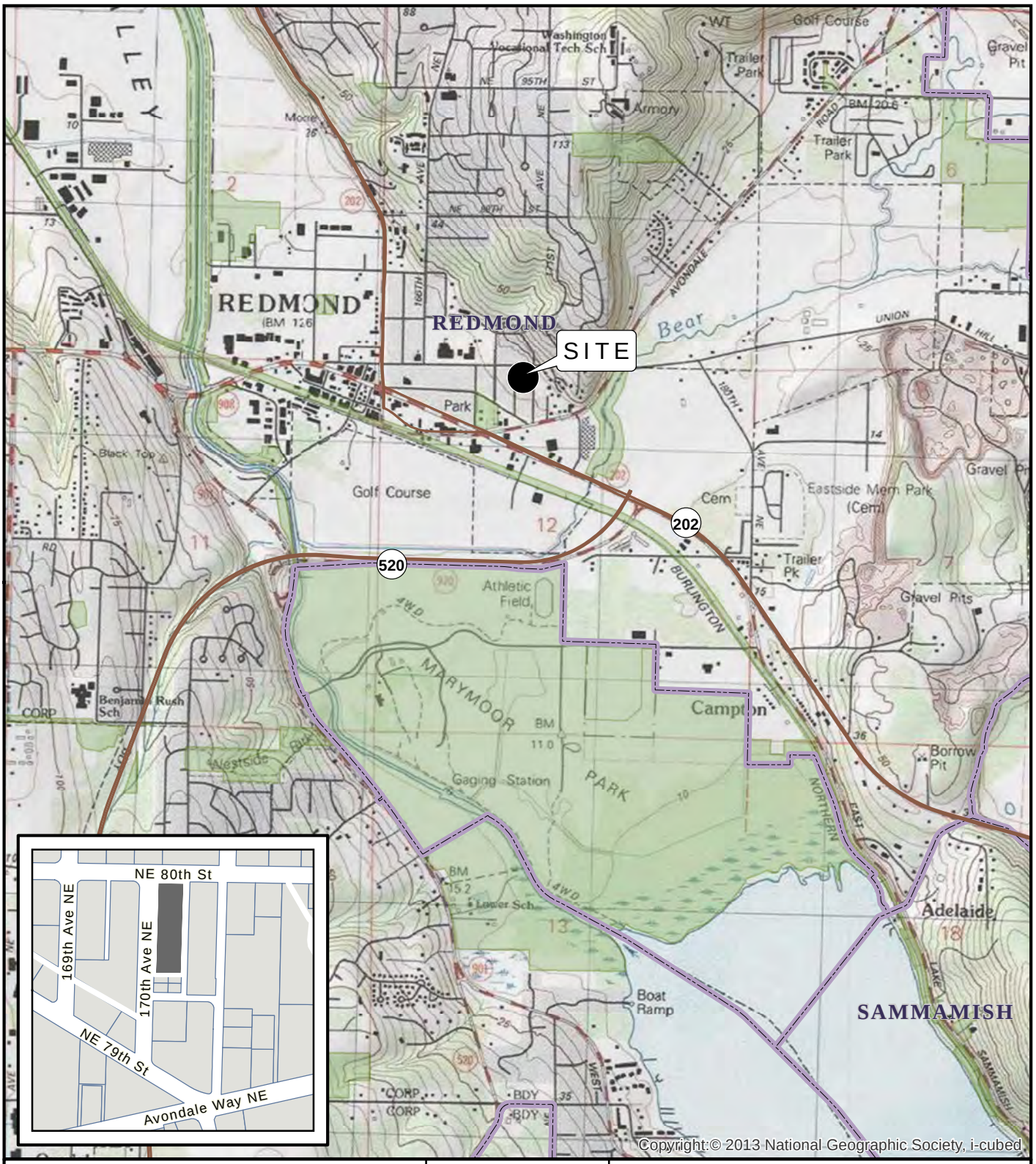

DATA SOURCES / REFERENCES:
USGS: 7.5' SERIES TOPOGRAPHIC MAPS, ESRI/I-CUBED/NGS 2013
KING CO: STREETS, PARCELS, CITY LIMITS 1/18

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

N

0 1000 2000
FEET

NOTE: BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

associated earth sciences incorporated

VICINITY MAP

PENNY LANE II & III
REDMOND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180106E001	4/19	1

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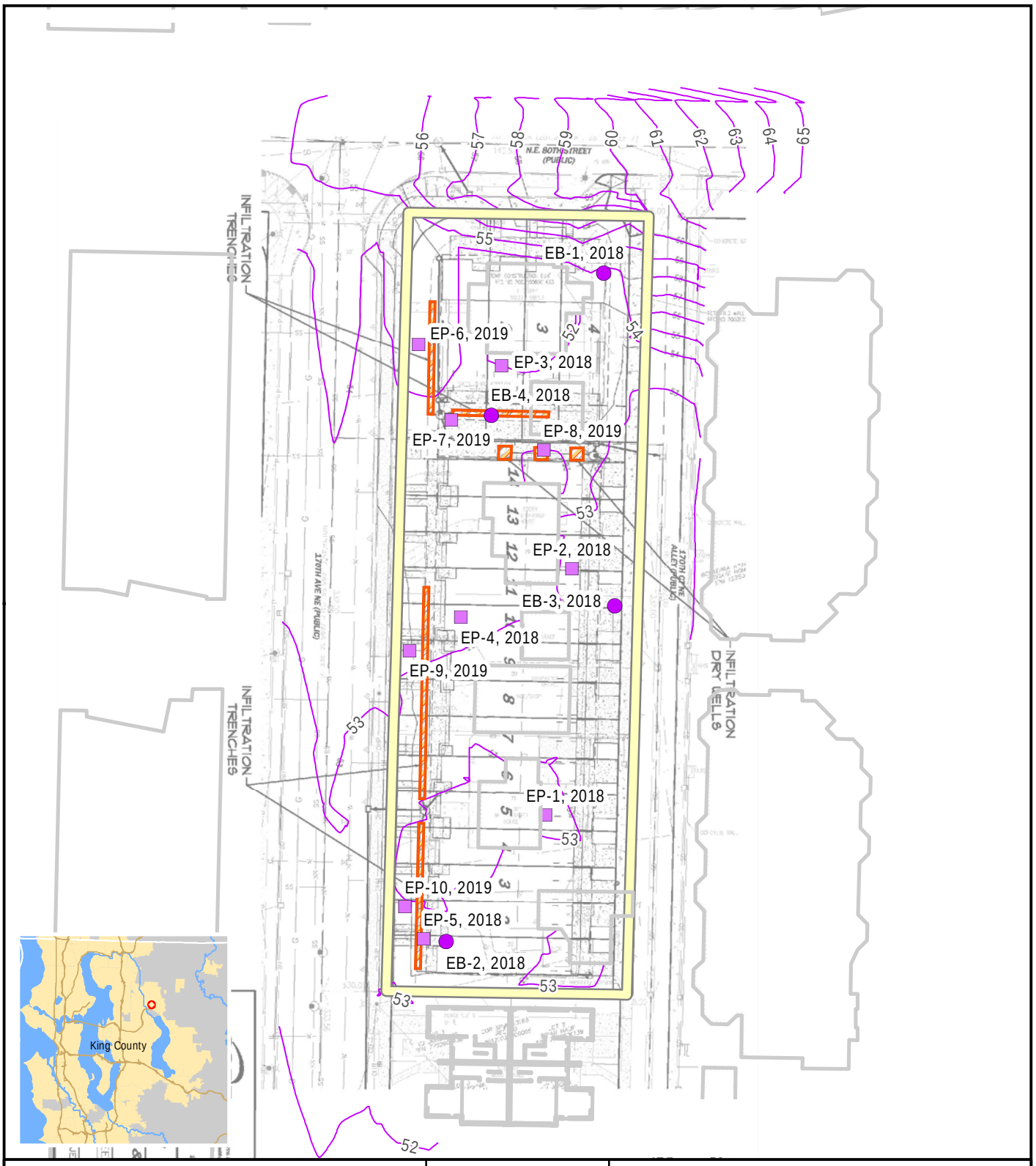

SITE

EXPLORATION PIT

EXPLORATION BORING

INFILTRATION FEATURE

CONTOUR 2 FT

DATA SOURCES / REFERENCES:
KING CO: STREETS, PARCELS 1/18, AERIAL PICTOMETRY INT. 2015
SITE PLAN FROM CORE DESIGN, APRIL 2019, SHEET 1 SITE PLAN

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

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SITE AND EXPLORATION PLAN

PENNY LANE II & III
REDMOND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180106E001	4/19	2

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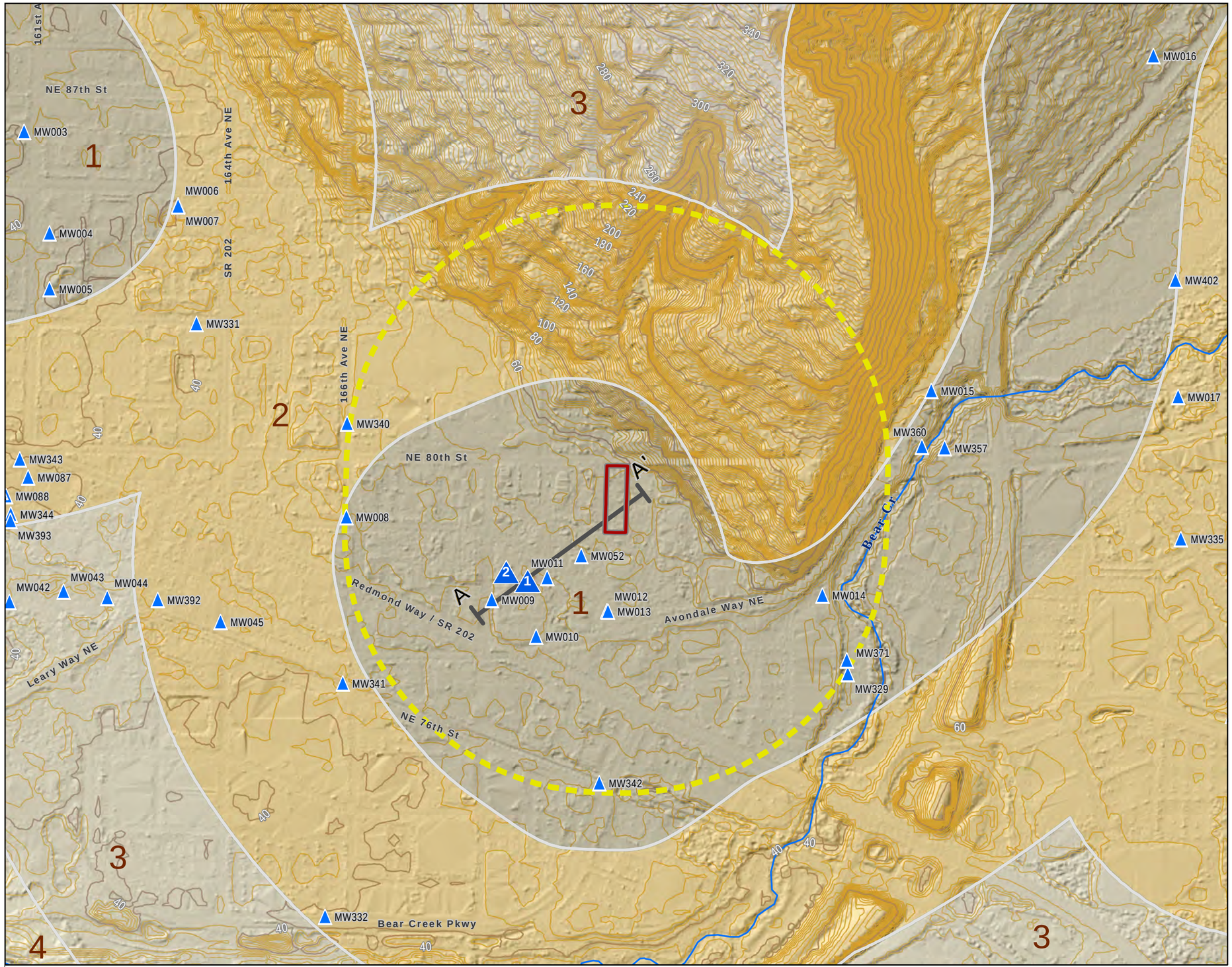


SITE

1300 SITE RADIUS

CITY OF REDMOND PRODUCTION WELL

CITY OF REDMOND MONITORING WELL

CROSS SECTION

CONTOUR 20 FT

CONTOUR 5 FT

WELLHEAD PROTECTION ZONE

1

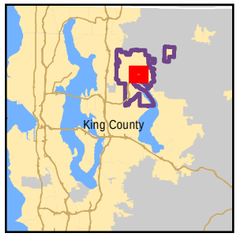
2

3

4

DATA SOURCES / REFERENCES:
PSLC: LIDAR 2014, GRID CELL SIZE IS 3'.
WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.
CITY OF REDMOND: WELLS, PROTECTION ZONES 8/14
KING CO:STREETS, WATER, PARCELS 1/18
WELL REPORT:
GEOENGINEERS WESTPARK WELLHEAD PROTECTION AND STORMWATER INFILTRATION ANALYSIS 2012: MONITORING WELLS

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



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WELL LOCATION AND WELLHEAD PROTECTION ZONES

PENNY LANE II & III
REDMOND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180106E001	4/19	3

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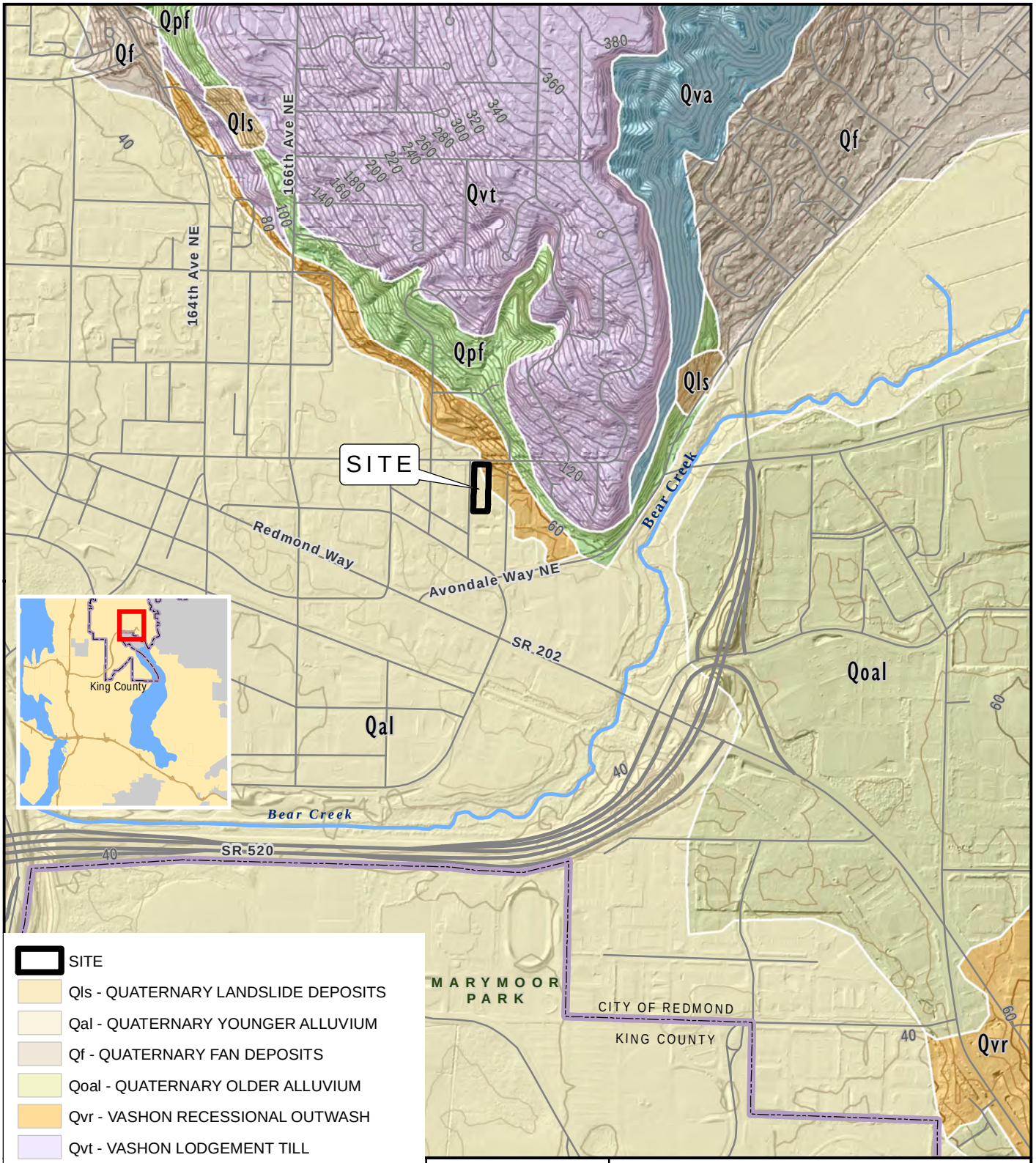

SITE

Qls - QUATERNARY LANDSLIDE DEPOSITS

Qal - QUATERNARY YOUNGER ALLUVIUM

Qf - QUATERNARY FAN DEPOSITS

Qoal - QUATERNARY OLDER ALLUVIUM

Qvr - VASHON RECESSIONAL OUTWASH

Qvt - VASHON LODGEMENT TILL

Qva - VASHON ADVANCE OUTWASH

Qpf - PRE-FRASER, UNDIFFERENTIATED

CONTOUR 20 FT

CONTOUR 5 FT

DATA SOURCES / REFERENCES:
PSLC: LIDAR REDMOND 2014, GRID CELL SIZE IS 3'.
WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.
CONTOURS FROM LIDAR
KING CO: STREETS 1/18, WATER 1/17
GEOMAPNW: KING CO. GEOLOGY 2007, BEAR CREEK 2007
WADNR: 100K GEOLOGY
LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE

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SURFACE GEOLOGY

PENNY LANE II & III
REDMOND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180106E001	4/19	4

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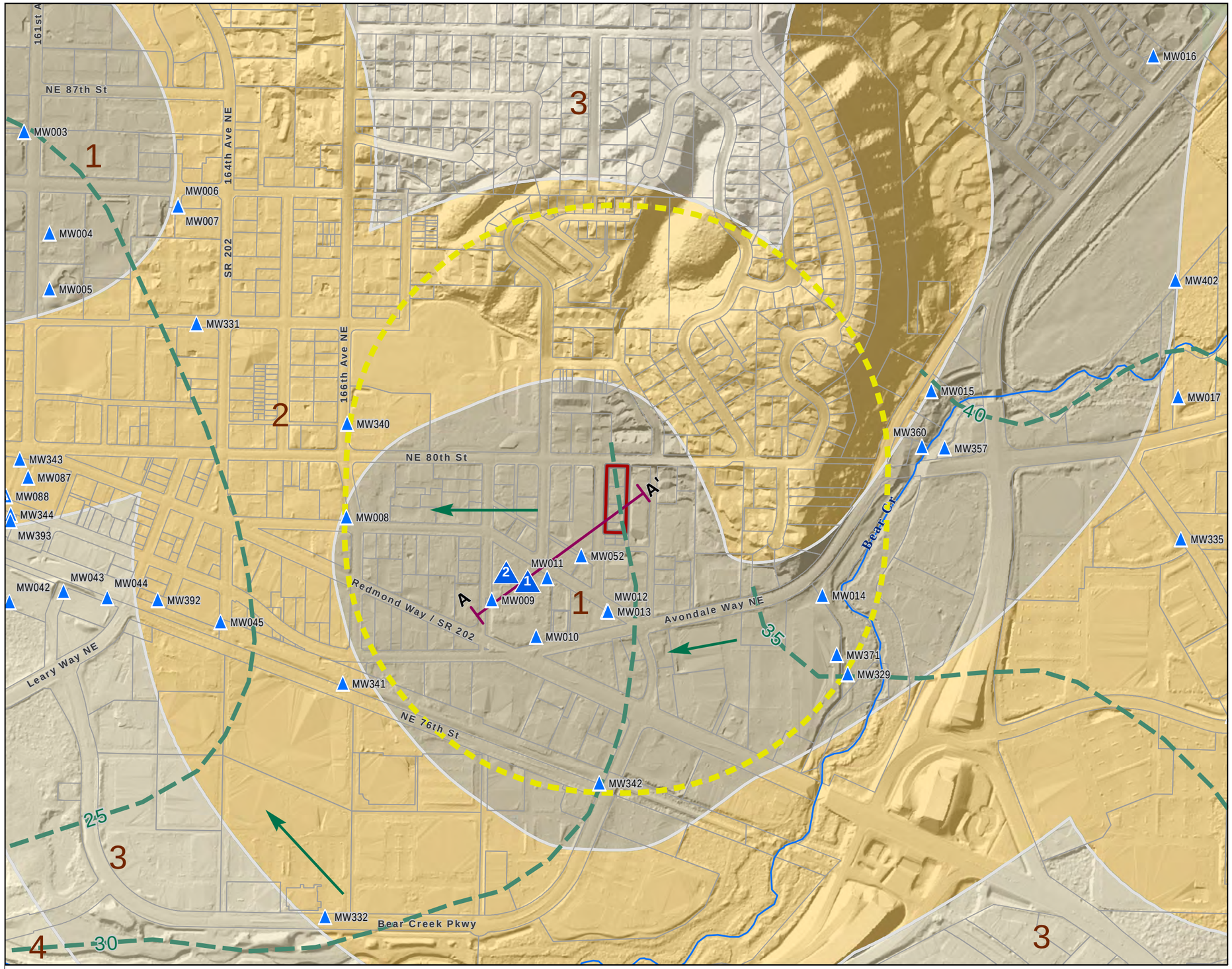


SITE

CITY OF REDMOND PRODUCTION WELL

CITY OF REDMOND MONITORING WELL

1300 SITE RADIUS

GROUNDWATER ELEVATION CONTOUR FROM JAN. 2019

CROSS SECTION

GROUNDWATER FLOW

PARCEL

WELLHEAD PROTECTION ZONE

1

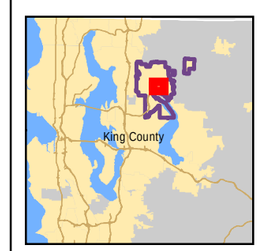
2

3

4

DATA SOURCES / REFERENCES:
PSLC: LIDAR 2014, GRID CELL SIZE IS 3'.
WA STATE PLANE NORTH, NAD83(HARN) NAVD88, US SURVEY FEET.
CITY OF REDMOND: WELLS, PROTECTION ZONES 8/14
KING CO:STREETS, WATER, PARCELS 1/18
WELL REPORT:
GEOENGINEERS WESTPARK WELLHEAD PROTECTION AND STORMWATER INFILTRATION ANALYSIS 2012: MONITORING WELLS GROUNDWATER CONTOURS FROM GOLDER GROUNDWATER WINTER 2019 SAMPLING, FIG1, 1/19

LOCATIONS AND DISTANCES SHOWN ARE APPROXIMATE



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GROUNDWATER ELEVATION CONTOUR MAP

PENNY LANE II & III
REDMOND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180106E001	4/19	5

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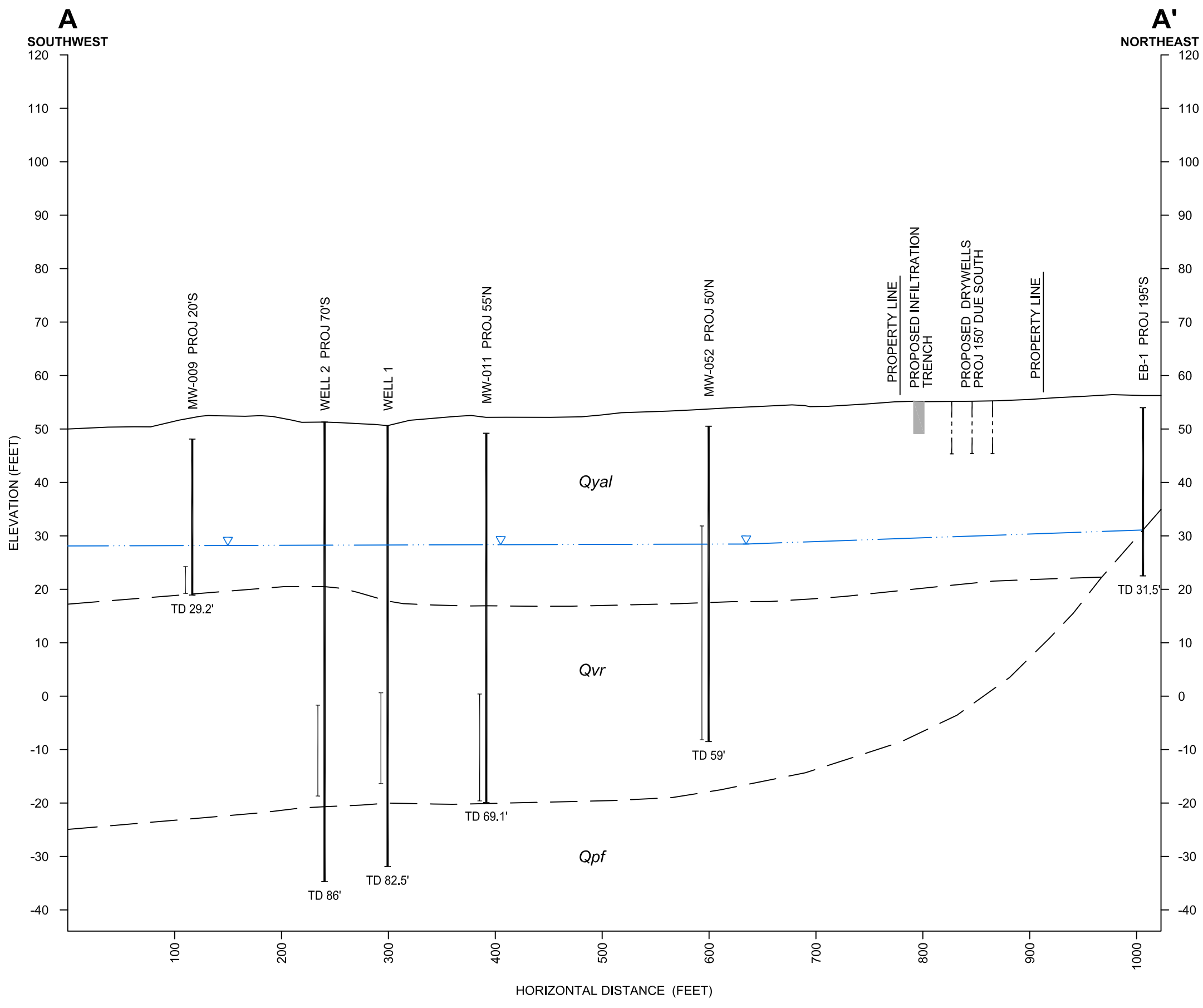


LEGEND:

Qyal	YOUNGER ALLUVIUM
Qvr	VASHON RECESSIONAL OUTWASH
Qpf	PRE - FRASER SEDIMENTS
	WELL / BORING
	SCREENED INTERVAL
TD	TOTAL DEPTH OF BORING
	GEOLOGIC CONTACT
	GROUNDWATER ELEVATIONS BASED ON WINTER 2018 MONITORING REPORT - GOLDER 2018A

VERTICAL EXAGGERATION = 5X

NOTE: LOCATION AND DISTANCES SHOWN ARE APPROXIMATE

NOTES:
1. THE SUBSURFACE CONDITIONS PRESENTED IN THIS GEOLOGIC CROSS-SECTION ARE BASED ON AN INTERPRETATION OF CONDITIONS ENCOUNTERED IN WIDELY SPACED EXPLORATIONS COMPLETED AT THE SUBJECT SITE AND RELEVANT SITE INFORMATION DEVELOPED AND PROVIDED BY OTHERS. THE SUBSURFACE INTERPRETATIONS PRESENTED IN THIS GEOLOGIC CROSS-SECTION SHOULD NOT BE CONSTRUED AS A WARRANTY OF ACTUAL SUBSURFACE CONDITIONS AT THE SITE. OUR EXPERIENCE HAS SHOWN THAT SOIL AND GROUNDWATER CONDITIONS CAN VARY SIGNIFICANTLY OVER SMALL DISTANCES.

BLACK AND WHITE REPRODUCTION OF THIS COLOR ORIGINAL MAY REDUCE ITS EFFECTIVENESS AND LEAD TO INCORRECT INTERPRETATION

associated earth sciences incorporated

GENERALIZED HYDROGEOLOGIC CROSS-SECTION A - A'
PENNY LANE II AND III
REDMOND, WASHINGTON

PROJ NO.	DATE:	FIGURE:
180106E001	4/19	6

180106 Penny Lane \ GeoSect.dwg LAYOUT: E001 F6 Sect A-A

APPENDIX A

On-Site Exploration Logs,
City Well Logs

Coarse-Grained Soils - More than 50% (1) Retained on No. 200 Sieve	Gravels - More than 50% (1) of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines (5)	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥12% Fines (5)	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% (1) or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines (5)	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥12% Fines (5)	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% (1) or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

Coarse-Grained Soils

Density	SPT(2) blows/foot
Very Loose	0 to 4
Loose	4 to 10
Medium Dense	10 to 30
Dense	30 to 50
Very Dense	>50

Fine-Grained Soils

Consistency	SPT(2) blows/foot
Very Soft	0 to 2
Soft	2 to 4
Medium Stiff	4 to 8
Stiff	8 to 15
Very Stiff	15 to 30
Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

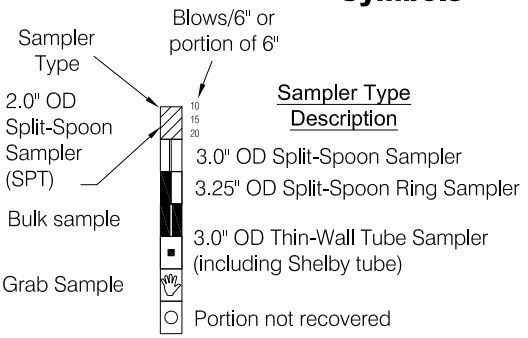
(3) Estimated Percentage

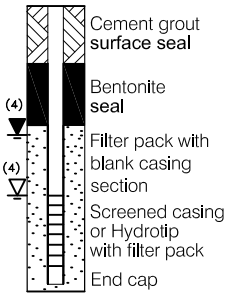
Component	Percentage by Weight
Trace	<5
Some	5 to <12
Modifier (silty, sandy, gravelly)	12 to <30
Very *modifier* (silty, sandy, gravelly)	30 to <50

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of ground water
▼ ATD = At time of drilling
▽ Static water level (date)
(5) Combined USCS symbols used for fines between 5% and 12%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

LOG OF EXPLORATION PIT NO. EP-1

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Grass - 4 inches
	Alluvium
1	Medium dense, moist, light brown to brown, gravelly, fine to medium SAND, trace silt; weathered horizon; Cobbles (2 to 8 inches in diameter); stratified (SP).
2	
3	
4	Moderate caving.
5	
6	
7	
8	Increased moisture in excavated soils.
9	
10	Medium dense, moist to very moist, light brown to gray, medium to coarse sandy, GRAVEL, trace silt (GW).
11	
12	Very moist.
13	
14	Medium dense, very moist to wet, light brown, gravelly, fine to medium SAND, trace to some silt (SP-SM).
15	
16	Bottom of exploration pit at depth 15 feet No seepage. Moderate caving.
17	
18	

Penny Lane II & III
Redmond, WA

Logged by: TG
Approved by: JHS

associated earth sciences incorporated

Project No. 180106E001
4/21/18

LOG OF EXPLORATION PIT NO. EP-2

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Grass Turf - 4 inches
	Topsoil - 9 inches
1	Root zone 1 to 2.5 feet
	Alluvium
2	Medium dense, moist, light brown and gray, fine SAND, some gravel, trace silt; minor cobbles (2 to 4 inches in diameter) (SP).
3	
4	Some stratification of fine and coarse gravel.
5	
6	
7	
8	Increased moisture.
9	Medium dense, very moist, gray to brown, gravelly, fine to medium SAND, some silt; silt coated gravel; some stratification (SP-SM).
10	
11	
12	
13	
14	
15	Bottom of exploration pit at depth 14 feet No seepage. Moderate to heavy caving.
16	
17	
18	

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Project No. 180106E001
4/21/18

LOG OF EXPLORATION PIT NO. EP-3

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Grass Turf - 4 inches
	Topsoil - 6 inches
1	**Alluvium**
2	Loose, moist, light brown to brown, fine to medium SAND, some gravel, trace silt; some stratification apparent (SP).
3	
4	
5	Denser material at 5 feet, increase in cobbles.
6	
7	Layers of silt.
8	
9	Medium dense, moist, dark brown to gray, fine to medium sandy, GRAVEL, some to trace silt (GP).
10	Heavy caving below 10 feet.
11	Increase in moisture.
12	
13	
14	Larger cobbles (3 to 6 inches in diameter)
15	Medium dense, very moist, dark brown to dark gray, gravelly, fine to medium SAND, some to trace silt (SP-SM).
16	Bottom of exploration pit at depth 15.5 feet No seepage. Moderate caving 0 to 10 feet, heavy caving below 10 feet.
17	
18	

KCTP3 180106.GPJ March 26, 2019

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Redmond, WA

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Project No. 180106E001

4/21/18

LOG OF EXPLORATION PIT NO. EP-4

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Crushed Rock - 9 inches
1	**Fill** Silty sand with gravel.
2	**Alluvium** Weathered horizon with roots 2 to 4 feet.
3	Loose, moist, brown to reddish brow, silty, fine SAND, some gravel (SM).
4	
5	Obvious stratification.
6	
7	
8	Denser material at 8 feet, larger cobbles (3 to 6 inches in diameter).
9	Medium dense, moist, dark brown to gray, very sandy, GRAVEL, trace silt; predominantly medium to coarse sand (GW).
10	Heavy caving below 9 feet.
11	
12	Increased moisture.
13	
14	
15	Medium dense, very moist, light brown, to gray, gravelly, fine to medium SAND, trace to some silt (SP-SM).
	Bottom of exploration pit at depth 15 feet No seepage. Moderate caving 0 to 9 feet, heavy caving below 9 feet.
16	
17	
18	

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Redmond, WA

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Approved by: JHS

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Project No. 180106E001
4/21/18

LOG OF EXPLORATION PIT NO. EP-5

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Grass Turf - 4 inches
	Fill
1	Crushed rock material
2	**Alluvium**
	Black plastic at 2 feet.
3	
4	Medium dense, moist, brown to gray, sandy, GRAVEL, trace silt; large cobbles (3 to 9 inches in diameter) (GP).
5	Medium dense, moist, light brown to brown, medium to coarse sandy, GRAVEL, trace silt; obvious stratification (GP).
6	
7	Tough digging conditions.
8	
9	
10	
11	
12	Increased moisture at 12 feet.
13	
14	Pockets of angular silt blocks encased in alluvium ("rip up clasts").
15	Medium dense, very moist, light brown to gray, gravelly, fine to coarse SAND, trace to some silt (SP-SM).
16	
17	Bottom of exploration pit at depth 16 feet No seepage. Moderate caving 2 to 8 feet, heavy caving below 8 feet.
18	

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Approved by: JHS

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Project No. 180106E001

4/21/18

LOG OF EXPLORATION PIT NO. EP-6

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Fill
1	Loose, dry, dark brown, silty, fine to medium SAND, some gravel; abundant organics including large roots and smaller rootlets (SM).
2	
3	Loose, dry to slightly moist, dark brownish red, silty, fine to medium SAND, some gravel; scattered organics (rootlets) (SM).
4	As above.
	Alluvium
5	Medium dense, slightly moist, brown, gravelly, fine to medium SAND, trace silt; minimal organics (rootlets) (SP).
6	
7	Medium dense, moist, brown, fine to coarse sandy, GRAVEL, trace silt (GP).
8	
9	Medium dense, moist, tan to brown, GRAVEL, some medium to coarse sand, trace silt; abundant scattered cobbles (≥ 6 inches) (GP).
10	
11	As above (GP).
12	Bottom of exploration pit at depth 11 feet No seepage. No caving.
13	
14	
15	
16	
17	
18	

Penny Lane II & III
Redmond, WA

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Approved by: JHS

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Project No. 180106E001
2/28/19

LOG OF EXPLORATION PIT NO. EP-7

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Fill
1	Loose, slightly moist, dark brown, silty, fine to medium SAND, trace to some gravel; abundant organics (SM).
2	Loose, slightly moist, brown to reddish brown, silty, fine to medium SAND, some gravel; scattered organics (rootlets) (SM).
3	**Alluvium**
4	Loose, slightly moist, brown, medium SAND, some gravel, trace silt (SP).
5	Loose, slightly moist, fine to medium SAND, trace to some gravel, trace silt (SP).
6	
7	
8	Loose to medium dense, slightly moist, brown, fine to medium sandy, GRAVEL, trace silt; minor scattered organics (GW).
9	Medium dense, slightly moist to moist, GRAVEL, some fine to coarse sand, trace silt; scattered cobbles (up to 7 inches); scattered organics (rootlets) (GW).
10	
11	Medium dense, moist, tan to brown, medium to coarse sandy, GRAVEL, trace silt; scattered cobbles (GW).
12	
13	Bottom of exploration pit at depth 12 feet No seepage. No caving.
14	
15	
16	
17	
18	

Penny Lane II & III
Redmond, WA

Logged by: BCY
Approved by: JHS

associated earth sciences incorporated

Project No. 180106E001

2/28/19

LOG OF EXPLORATION PIT NO. EP-8

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 53 ft
	Fill
1	Loose, dry, dark brown, silty, fine to medium SAND, some gravel; scattered organics and construction debris (SM).
	Alluvium
2	
3	Loose, slightly moist, tan, fine to medium SAND, trace to some gravel, trace silt (SP-SW).
4	Loose to medium dense, slightly moist, tan, fine to coarse SAND, trace to some gravel, trace silt (SP-SW).
5	
6	Medium dense, slightly moist to moist, tan, medium to coarse sandy, GRAVEL, trace silt; scattered cobbles (≥6 inches) (GW).
7	
8	Medium dense, moist, tan, medium to coarse sandy, GRAVEL, trace silt; scattered cobbles (4 to 6 inches); scattered rootlets (GW).
9	
10	As above; sand content coarsening (GW).
11	
12	Medium dense to dense, moist, tannish brown, GRAVEL, some medium to coarse sand, trace silt, trace cobbles; minor scattered organics (GW).
13	Bottom of exploration pit at depth 12.5 feet No seepage. Minor caving at 6 and 11 feet.
14	
15	
16	
17	
18	

Penny Lane II & III
Redmond, WA

Logged by: BCY
Approved by: JHS

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Project No. 180106E001
2/28/19

LOG OF EXPLORATION PIT NO. EP-9

Depth (ft)	This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered. **DESCRIPTION** Elev: 54 ft
	Alluvium
1	Medium dense, dry, tannish brown, silty, fine SAND, some gravel; scattered organics (rootlets) (SM).
2	
3	Medium dense, dry, tan, gravelly, fine to medium SAND, trace silt; scattered organics (rootlets) (SP).
4	
5	
6	Medium dense, dry, tan, medium to coarse sandy, GRAVEL, trace silt; scattered organics (rootlets) (GW).
7	
8	As above; cobbles (up to 6 inches) (GW).
9	
10	As above; cobbles (up to 4.5 inches) (GW).
11	Bottom of exploration pit at depth 10.5 feet No seepage. Minor caving at 4 feet, moderate caving at 9 feet.
12	
13	
14	
15	
16	
17	
18	

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Redmond, WA

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Approved by: JHS

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Project No. 180106E001

2/28/19

LOG OF EXPLORATION PIT NO. EP-10

Depth (ft)

This log is part of the report prepared by Associated Earth Sciences, Inc. (AESI) for the named project and should be read together with that report for complete interpretation. This summary applies only to the location of this trench at the time of excavation. Subsurface conditions may change at this location with the passage of time. The data presented are a simplification of actual conditions encountered.

DESCRIPTION

Elev: 54 ft

Fill

Loose, moist, gray, GRAVEL (~3/8 inch) (GP).

1

Topsoil / Fill

Loose, dry, reddish brown, silty, fine SAND, trace to some gravel; scattered organics (rootlets) (SM).

2

3

Alluvium

Loose to medium dense, slightly moist, tannish brown, medium sandy, GRAVEL, trace silt; scattered cobbles (GW).

4

5

6

Medium dense to dense, moist, gray, medium to coarse very sandy, GRAVEL, some cobbles (up to 6 inches), trace silt (GW).

7

8

Dense to medium dense, moist, gray, medium to coarse sandy, GRAVEL, some cobbles (up to 7 inches), trace silt (GW).

9

10

11

Dense, moist, gray to tan, medium to coarse sandy, GRAVEL, trace cobbles (up to 5 inches), trace silt; discontinuous silt interbed (5 inches thick) at 11 feet, transitions back to sandy gravel (GW).

12

Bottom of exploration pit at depth 12 feet
No seepage. Caving 5 to 12 feet.

13

14

15

16

17

18

Penny Lane II & III
Redmond, WA

Logged by: BCY

Approved by: JHS

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Project No. 180106E001

2/28/19

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Exploration Log

Project Number	Exploration Number	Sheet
180106E001	EB-1	1 of 1

Project Name	Penny Lane	Ground Surface Elevation (ft)	54
Location	Redmond, WA	Datum	NAVD 88
Driller/Equipment	Geologic Drill / Walk-behind or XL Trailer Rig	Date Start/Finish	3/28/18,3/28/18
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	6 inches

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Topsoil - 6 inches					
				Fill					
		S-1		Moist, brown to reddish brown, fine to medium SAND, some silt, some gravel; occasional organics (SP-SM).			2 2 2	▲4	
				Alluvium					
5		S-2		Moist, light brown to light brownish gray, fine to medium SAND, some gravel, trace silt; massive (SP).			2 5 4	▲9	
		S-3		Moist, light brown, fine SAND, trace gravel, trace silt' massive (SP).			1 2 10	▲12	
10		S-4		Moist, brown and gray, gravelly, fine to coarse SAND, trace silt; massive (SP).			6 12 17	▲29	
				Cobbles in drill cuttings, erratic drill action observed at 13 feet.					
15		S-5		Moist, brown and brownish gray, gravelly, fine to medium SAND, trace silt; broken rock in sampler (SP).			10 21 18	▲39	
				Very gravelly drilling observed at 17 feet.					
20		S-6		Very moist, brownish gray, gravelly, fine to medium SAND, trace silt; sampler tip is wet; broken rock in sampler (SP).		▼	14 17 21	▲38	
				Pre-Fraser Fine Grained Sediments					
				"Sticky" drilling observed at 23 feet.					
25		S-7		Very moist, gray to dark gray, SILT, trace sand, trace gravel; trace gravel present as dropstones; minor mica flakes (ML).			6 14 30	▲44	
				Very hard drilling at 27 feet.					
30		S-8		Very moist, gray to dark gray, SILT, trace gravel; trace gravel present as dropstones (ML).			22 25 32	▲57	
				Bottom of exploration boring at 31.5 feet					
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: TG
Approved by: JHS

associated earth sciences incorporated

Exploration Log

Project Number	Exploration Number	Sheet
180106E001	EB-2	1 of 1

Project Name	Penny Lane	Ground Surface Elevation (ft)	53
Location	Redmond, WA	Datum	NAVD 88
Driller/Equipment	Geologic Drill / Walk-behind or XL Trailer Rig	Date Start/Finish	3/28/18,3/28/18
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	6 inches

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Topsoil - 6 inches					
				Fill					
		S-1		Moist, light to dark brown, fine to medium SAND, some gravel, some silt; broken rock in sampler; occasional organics (SP-SM). Very cobbly drilling observed 3 to 4 feet; plastic in drill cuttings. Driller repositioned.			12 20 17	▲47	
5		S-2		As above. Very cobbly drilling observed 5 to 7.5 feet.			11 17 30	▲47	
				Bottom of exploration boring at 7 feet. Refusal due to cobbles.					
10									
15									
20									
25									
30									
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

Water Level ()

Water Level at time of drilling (ATD)

Logged by: TG

Approved by: JHS

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Exploration Log

Project Number	Exploration Number	Sheet
180106E001	EB-3	1 of 1

Project Name	Penny Lane	Ground Surface Elevation (ft)	53
Location	Redmond, WA	Datum	NAVD 88
Driller/Equipment	Geologic Drill / Walk-behind or XL Trailer Rig	Date Start/Finish	3/29/18,3/29/18
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	6 inches

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Topsoil - 4 inches					
				Alluvium					
		S-1		Moist, light brown to dark brown, fine to medium SAND, some silt, some gravel, ranging to silty, SAND; occasional organics (SP-SM/SM).			3 5 5	▲10	
5		S-2		Moist, light brown, gravelly, fine to medium SAND, some silt; large rock in sampler tip, pushing rock; low recovery (SP-SM). Very rough drilling observed 5 to 7.5 feet; large gravel and cobbles present in drill cuttings.			9 15 15	▲30	
		S-3		As above, sample may not be representative; large rock in sampler tip, pushing rock, low recovery. Very cobbly drilling observed 7.5 to 11 feet.			7 19 12	▲31	
10		S-4		Moist, light brown, gravelly, fine to medium SAND, trace silt (SP).			14 19 18	▲37	
				Driller used rock spike to break up cobbles.					
				Bottom of exploration boring at 13 feet					
15									
20									
25									
30									
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

Water Level ()

Water Level at time of drilling (ATD)

Logged by: TG

Approved by: JHS

associated earth sciences incorporated

Exploration Log

Project Number	Exploration Number	Sheet
180106E001	EB-4	1 of 1

Project Name	Penny Lane	Ground Surface Elevation (ft)	53
Location	Redmond, WA	Datum	NAVD 88
Driller/Equipment	Geologic Drill / Walk-behind or XL Trailer Rig	Date Start/Finish	3/29/18,3/29/18
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	6 inches

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Grass Turf / Topsoil - 4 inches					
				Fill					
		S-1		Very moist, gray to dark brown, very silty, fine SAND, trace gravel, trace organics (SM).			2 6 4	▲10	
5		S-2		Broken rock in sampler, sample not representative.			16 30 9	▲39	
				Cobbly drilling observed at 6 feet; driller noted pounding on rock, pushing rock, low recovery.					
		S-3		Moist, light brownish gray, sandy, SILT, trace gravel, ranges to silty, SAND; broken rock in sampler; contains pockets of dark brown, silty, sand (SM-ML). Driller used rock spike to break up cobbles, driller could not advance drill.			10 20 14	▲34	
10				Bottom of exploration boring at 9 feet					
15									
20									
25									
30									
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

Water Level ()

Water Level at time of drilling (ATD)

Logged by: TG

Approved by: JHS

PROJECT: HDR/REDMOND WELLS/WA

RECORD OF DRILL HOLE REPLACEMENT WELL 1

DATUM:

PROJECT NUMBER: 023 1277.504

WELL LOCATION: Anderson Park Redmond, WA (T25N, R5E, NE1/4, NW1/4, SEC. 12)

BORING DATE: 01/07/03 to 01/22/03

DEPTH FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	GRAPHIC LOG	GEOLOGIC UNIT	SAMPLES: SOIL	SAMPLES: WATER	WELL CONSTRUCTION
0	Cable Tool	Ground Elevation = 41 ft above Mean Sea Level					
		0-15.0 feet Grayish brown to olive SAND, GRAVEL, and gravelly SAND, little silt, contains a lot of water, no organics		Younger Alluvium (Qyal)			APPROXIMATELY 2.0 FEET OF STICKUP WITH WELDED STEEL CAP AND ACCESS PORTS; CEMENT-BENTONITE GROUT SURFACE SEAL (0-22.0 FEET); 22.0 FEET
05							
10							
15		**15-33.0 feet** Olive SAND and silt-bound GRAVEL					
20		little silt, no organics					
25		trace to little silt and some sand, contains very little water					
30						RW1-32	PRODUCTION CASING 0.375-INCH WALL, 24-INCH DIAMETER STEEL CASING (0- 50.0 FEET)
35		**33-38.0 feet** Olive gray SAND and sandy GRAVEL -some cobbles, trace to little silt and fine sand, contains very little water		Recessional Out Wash (Qvr)			
40		**38-48.0 feet** Dark gray clean SAND, little to some GRAVEL trace silt and fine sand, few cobbles, contains very little water					

DRILL RIG: Bucyrus Erie BE-72 Cable Tool

DRILLING CONTRACTOR: Holt Drilling

DRILLER: Richard Miller

LOGGED: S. Collins/M. Lumpkin

CHECKED: Michael Klisch

DATE: 03/11/03

Golder Associates

PROJECT: HDR/REDMOND WELLS/WA

RECORD OF DRILL HOLE
REPLACEMENT WELL 1

DATUM:

PROJECT NUMBER: 023 1277.504

WELL LOCATION: Anderson Park Redmond, WA (T25N, R5E, NE1/4, NW1/4, SEC. 12)

BORING DATE: 01/07/03 to 01/22/03

DEPTH FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	GRAPHIC LOG	GEOLOGIC UNIT	SAMPLES: SOIL	SAMPLES: WATER	WELL CONSTRUCTION
40	Cable Tool	**38-48.0 feet (continued)** Dark gray clean SAND, little to some GRAVEL trace silt and fine sand, few cobbles, contains very little water		Recessional Out Wash (Qvr)		RW1-40	RISER-22-INCH DIA. 0.375-INCH WALL STEEL CASING WITH NEOPRENE "K" PACKER (45.0-50.0 FEET) 45.0 FEET
45		**48-59.0 feet** Olive gray clean SAND, little to some GRAVEL -trace to some silt and sand, few cobbles				RW1-48	50.0 FEET
50							SCREEN 24-INCH TELESCOPIC, STAINLESS STEEL, CONTINUES VEE-WIRE SCREEN STANDARD, CONSTRUCTION, 100-SLOT (0.100-INCHES)(50.0-67.0 FEET)
55						RW1-55	
60		**59-71.0 feet** Olive gray to olive brown SAND -trace silt, some sand, few cobbles					
65		a lot of water				RW1-64	67.0 FEET
70						RW1-71.5	TAILPIPE-22-INCH DIAMETER 0.375-INCH WELL STEEL CASING WITH BALL BOTTOM (67.0-75.0 FEET)
75		**71-82.5 feet** Dark olive gray fine SAND -trace silt, some cobbles and gravel contains little water		Transitional Beds (Qtb)? or Fine Olympia Beds (qob)?			75.0 FEET PEA GRAVEL BACKFILL (75.0-82.5 FEET)
80							

DRILL RIG: Bucyrus Erie BE-72 Cable Tool

DRILLING CONTRACTOR: Holt Drilling

DRILLER: Richard Miller

LOGGED: S. Collins/M. Lumpkin

CHECKED: Michael Klisch

DATE: 03/11/03

Golder Associates

PROJECT: HDR/REDMOND WELLS/WA

RECORD OF DRILL HOLE
REPLACEMENT WELL 1

DATUM:

PROJECT NUMBER: 023 1277.504

WELL LOCATION: Anderson Park Redmond, WA (T25N, R5E, NE1/4, NW1/4, SEC. 12)

BORING DATE: 01/07/03 to 01/22/03

DEPTH FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	GRAPHIC LOG	GEOLOGIC UNIT	SAMPLES: SOIL	SAMPLES: WATER	WELL CONSTRUCTION	
75	Cable Tool	**71-82.5 feet (continued)** Dark olive gray fine SAND trace silt, some cobbles and gravel		Transitional Beds (Qtb) ? or Fine Olympia Beds (ob) ?		RW1-80	75.0 FEET 82.5 FEET	PEA GRAVEL BACKFILL (75.0-82.5.0 FEET)
80		**Total Depth = 82.5 feet**						
85								
90								

DRILL RIG: Bucyrus Erie BE-72 Cable Tool

DRILLING CONTRACTOR: Holt Drilling

DRILLER: Richard Miller

LOGGED: S. Collins/M. Lumpkin

CHECKED: Michael Klisch

DATE: 03/11/03

Golder Associates

PROJECT: HDR/REDMOND WELLS/WA

RECORD OF DRILL HOLE
REPLACEMENT WELL 2

DATUM:

PROJECT NUMBER: 023 1277.104

WELL LOCATION: Anderson Park Redmond, WA

BORING DATE: 12/12/02 to 01/02/03

DEPTH FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	GRAPHIC LOG	GEOLOGIC UNIT	SAMPLES: SOIL	SAMPLES: WATER	WELL CONSTRUCTION
0	Cable Tool	Ground Elevation = 41 ft above Mean Sea Level **0.0 to 18.0 feet** Dense to very dense, dark grayish brown, sandy GRAVEL grading to gravelly SAND, little to trace cobbles.		Younger Alluvium (Qyal)			APPROXIMATELY 2.0 FEET OF STICKUP WITH WELDED CAP 3 AND ACCESS PORTS
05		Silty matrix attached to cobbles 5 feet to 10 feet.					CEMENT-BENTONITE GROUT SURFACE SEAL (0-30.0 FEET)
10							
15		Silty matrix on cobbles at 15 feet.					
20		**18.0 to 33.0 feet** Compact to dense, olive, gravelly medium to coarse SAND grading to GRAVEL and SAND, silt matrix, trace to little rounded cobbles, moist. Becomes wet at 22.0 feet.				▽	
25							
30							30.0 FEET
35		**33.0 to 37.0 feet** Dense, dark olive gray, sandy GRAVEL, some rounded cobbles (up to 4" to 6"), trace silt, wet. 10" cobble at 35.0 feet.		Vashon Recessional Deposits (Qvr)		RW2-33	PRODUCTION CASING24-INCH DIA STEEL CASING 0.375-INCH WALL (0- 53.0 FEET)
		37.0 to 50.0 feet Dense to very dense, dark olive gray to very dark gray, SAND, some gravel, scattered cobbles, trace silt, wet.				RW2-40	
40							

DRILL RIG: Bucyrus Erie BE-72 Cable Tool

LOGGED: S. Collins/M. Lumpkin

DRILLING CONTRACTOR: Holt Drilling

CHECKED: Michael Klisch

DRILLER: Richard Miller

DATE: 3/11/03

Golder Associates

PROJECT: HDR/REDMOND WELLS/WA

RECORD OF DRILL HOLE
REPLACEMENT WELL 2

DATUM:

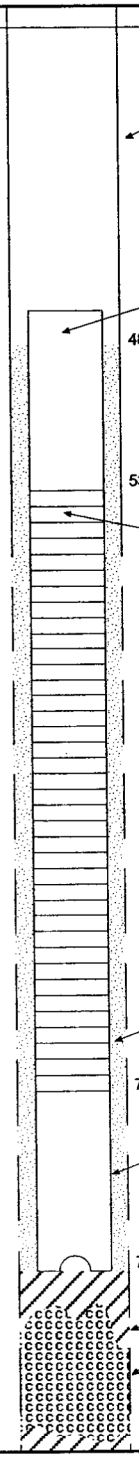
PROJECT NUMBER: 023 1277.104

WELL LOCATION: Anderson Park Redmond, WA

BORING DATE: 12/12/02 to 01/02/03

DEPTH FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	GRAPHIC LOG	GEOLOGIC UNIT	SAMPLES: SOIL	SAMPLES: WATER
40	Cable Tool	**37.0 to 50.0 feet (continued)** Dense to very dense, dark olive gray to very dark gray, SAND, some gravel, scattered cobbles, trace silt, wet. 10-inch cobble at 42 feet. Three 6-8-inch cobbles with silt matrix coating at 43 feet.		Vashon Recessional Deposits (Qvr)		RW2-40
45						
50		**50.0 to 54.0 feet** Dense to very dense, dark olive gray, clean medium SAND, trace fine gravel, wet.				RW2-48
55		**54.0 to 56.5 feet** Dense to very dense, dark olive gray, clean SAND, little to some gravel, wet. Silt nodule at 55.5 feet.				RW2-55
		56.5 to 59.0 feet Dense to very dense, dark olive gray grading to dark olive brown, GRAVEL and SAND, wet. Becomes browner with depth.				
60		**59.0 to 72.0 feet** Dense to very dense, dark olive gray grading to very dark grayish brown, clean SAND, trace to little gravel, wet. 13 feet of heaving fine to medium SAND in 2" water sampling pipe at 64 feet. Gravel increases to little below 65.5 feet.				
65						RW2-64
70						RW2-70
		72.0 to 78.5 feet Dense to very dense, dark olive gray, fine SAND, little silt, trace fine gravel, wet.		Transitinal Beds (Qtb) ? or Fine Olympia Beds (ob)?		
75						RW2-77
80						

WELL CONSTRUCTION



DRILL RIG: Bucyrus Erie BE-72 Cable Tool

DRILLING CONTRACTOR: Holt Drilling

DRILLER: Richard Miller

LOGGED: S. Collins/M. Lumpkin

CHECKED: Michael Klisch

DATE: 3/11/03

Golder Associates

PROJECT: HDR/REDMOND WELLS/WA

RECORD OF DRILL HOLE
REPLACEMENT WELL 2

DATUM:

PROJECT NUMBER: 023 1277.104

WELL LOCATION: Anderson Park Redmond, WA

BORING DATE: 12/12/02 to 01/02/03

DEPTH FEET	BORING METHOD	SOIL PROFILE: DESCRIPTION	GRAPHIC LOG	GEOLOGIC UNIT	SAMPLES: SOIL	SAMPLES: WATER	WELL CONSTRUCTION	
75	Cable Tool	**72.0 to 78.5 feet (continued)** Dense to very dense, dark olive gray, fine SAND, little silt, trace fine gravel, wet.		Transitional Beds (Qtb) ? or Fine Olympia Beds (ob) ?		RW2-77		BACKFILL-PEA GRAVEL PLUS BENTONITE CHIPS (75.0-86.0 FEET)
80		**78.5 feet** Dense, dark grayish brown (2.5y 4/4/2), fine to medium SAND, little coarse sand, little fine coarse gravel, trace. "clasts" of coarse laminated CLAYEY SILT ~ 1" thick with little sand, trace silt, wet.						
		81.0 feet Dense, dark grayish brown (2.5y 4/4/2), fine to medium SAND, little coarse sand, trace fine to medium gravel, trace silt, wet.						
85		**83.5 feet** Dense, very dense dark grayish brown (2.5y 4/2), fine to medium Sand, little silt, moist mica flakes, cruttings 83.5'-85, fine to medium SAND.					86.0 FEET	
		86.0 feet Dense, very dense fine to medium SAND, little silt. **Total Depth = 86 feet**						
90								

DRILL RIG: Bucyrus Erie BE-72 Cable Tool

DRILLING CONTRACTOR: Holt Drilling

DRILLER: Richard Miller

LOGGED: S. Collins/M. Lumpkin

CHECKED: Michael Klisch

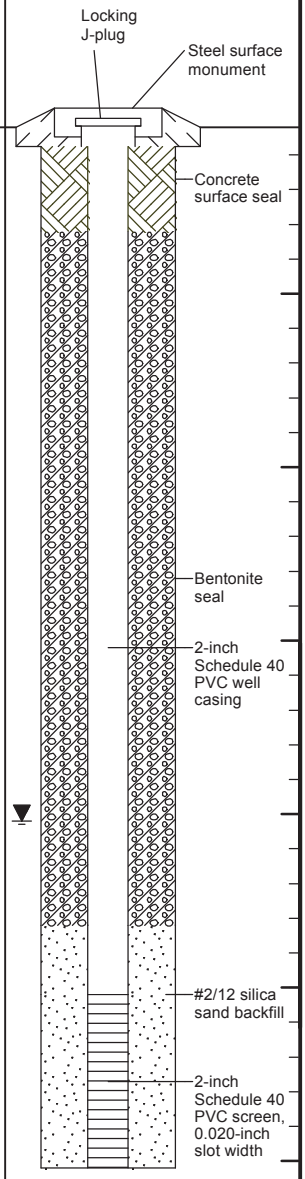
DATE: 3/11/03

Golder Associates

Date(s) Drilled	11/05/07	Logged By	MSL/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	CME 75	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted
Total Exploration Depth (ft)	31	Ground Surface Elevation (ft)	44.8	Groundwater Elevation (ft)	24.8
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1323668.5 248509.6

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0							OL	Dark brown organic silt with fine to medium sand		
								SM	Brown silt and sand with fine to medium gravel		
								SP	Brown medium to coarse sand with occasional fine to coarse gravel		
	5	☒			1					SS	2.0
								SP	Grayish brown fine to medium sand with gravel and trace silt (dense, moist)		
	10	■	12	47	2					NS	0.0
	15	■	14	54	3	CA				NS	0.0
									Becomes very dense		
								GP	Gray fine gravel with sand and trace silt (very dense, wet)		
	20	■	4	61	4					NS	0.0
								SP	Gray medium to coarse sand with occasional fine gravel (very dense, wet)		
	25	■	9	89/9"	5					NS	0.0
	30	■	12	79	6					NS	0.0
	35										

WELL CONSTRUCTION



Note: See Figure A-1 for explanation of symbols.

LOG OF MONITORING WELL 550000MW008

GEOENGINEERS

Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

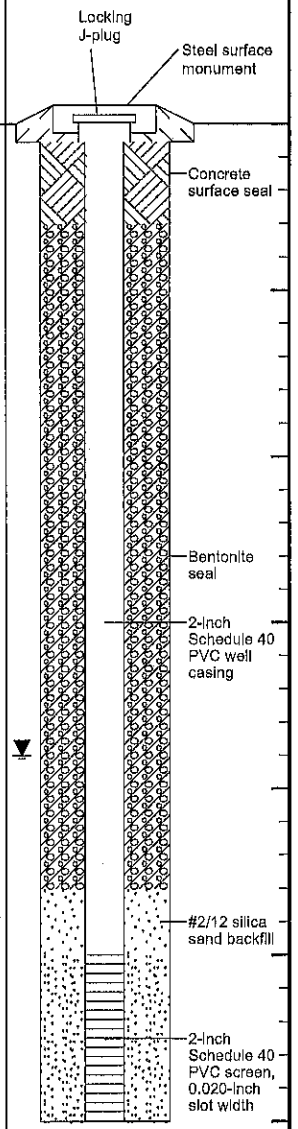
Figure A-9
Sheet 1 of 1

V6_ENVWELL P:\0\0500147\00\FINALS\050014700.GPJ GEIV6_1.GDT 4/3/08

Date(s) Drilled	11/20/07	Logged By	MSL/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	Limited Access Rig	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	140 lb hammer/30 in drop	Drilling Equipment	Track-mounted
Total Exploration Depth (ft)	30.5	Ground Surface Elevation (ft)	45	Groundwater Elevation (ft)	26
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1324394 248096.7

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0							SM	Dark brown silty fine sand with organic matter		
								GM	Brown silty fine to coarse gravel with cobbles, boulders and sand	SS	--
	5				1			GP-GM	Gray fine to coarse gravel with sand and silt (dense, moist)		
	10	■	6	50/6"	2					NS	0.0
								SP	Gray fine to medium sand, occasional gravel and trace silt (dense, moist)		
	15	■	6	50/6"	3	CA				NS	0.0
								SP	Gray medium to coarse sand with gravel and trace silt (dense, wet)		
	20	■	6	50/6"	4					NS	0.0
	25	■	6	50/6"	5					NS	0.0
	30	■	6	50/6"	6					NS	0.0
	35										

WELL CONSTRUCTION



Note: See Figure A-1 for explanation of symbols.

LOG OF MONITORING WELL 550000MW009

GEOENGINEERS

Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

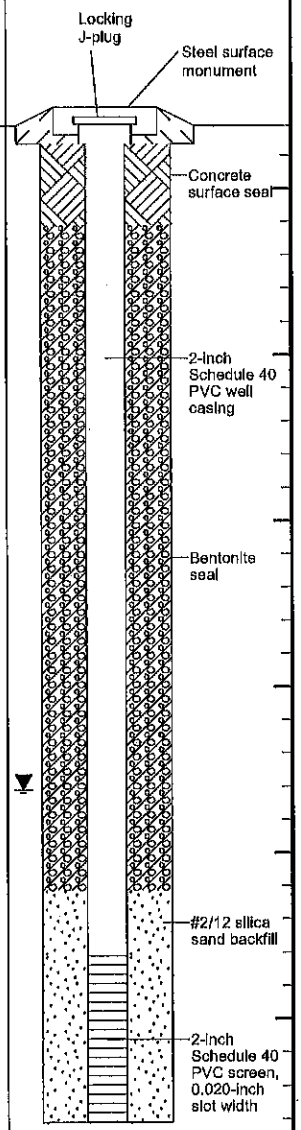
Figure A-10
Sheet 1 of 1

V6 ENVWELL P:\0\0500147\00\FINALS\050014700.GPJ GEIV6_1.GDT 4/3/08

Date(s) Drilled	01/14/08	Logged By	ARJ/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	CME 75	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted
Total Exploration Depth (ft)	30.5	Ground Surface Elevation (ft)	46.9	Groundwater Elevation (ft)	26.9
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1324614.9 247913.7

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0							SM	Dark brown silty sand with organic matter		
								GW	Brown fine to coarse gravel with cobbles, sand and trace silt (dense, moist)		
	5	☒			1					SS	--
	10	■	3	50/6"	2			GP	Brown fine to coarse gravel with sand and trace silt (very dense, moist)	NS	--
	15	■	18	58	3	CA			With occasional orange mottling	NS	--
								SP-SM	Gray medium to coarse sand with gravel and silt (very dense, wet)		
	20	■	14	55	4					NS	--
								SP	Gray medium to coarse sand with gravel and trace silt (dense, wet)		
	25	■	10	47	5					NS	--
									Becomes very dense		
	30	■	5	50/5"	6					NS	--
	35										

WELL CONSTRUCTION



Note: See Figure A-1 for explanation of symbols.

LOG OF MONITORING WELL 490150MW010

GEOENGINEERS

Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

Figure A-11
Sheet 1 of 1

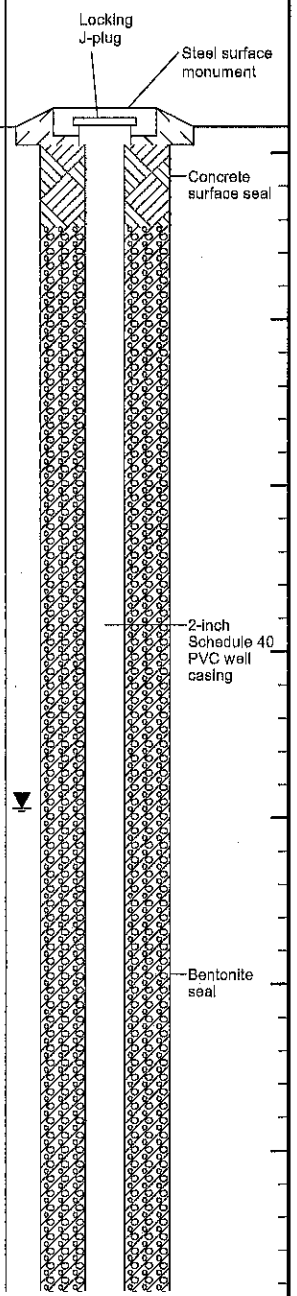
V6 ENVWELL P:\0\0500147\00\FINALS\0500147\00.GPJ GEIV6 1.GDT 4/3/08

Date(s) Drilled	11/05/07	Logged By	MSL/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	CME 75	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted
Total Exploration Depth (ft)	71.5	Ground Surface Elevation (ft)	45.8	Groundwater Elevation (ft)	25.3
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1324670.6 248206.4

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0				1			SM	Dark brown silty fine to medium sand with occasional fine gravel and trace organic matter (loose, moist) (topsoil)		
								SM			
					2			GW	Brown silty fine to medium sand with gravel and trace organic matter (medium dense, moist) Occasional cobbles		
	5								Gray to brown fine to coarse gravel with sand, occasional cobbles and trace silt (very dense, moist)		
			7	77/10"	3					NS	0.5
	10		14	77	4					NS	0.2
								SP	Gray medium to coarse sand with gravel and trace silt (dense, moist)		
	15		16	31	5	CA				NS	0.0
	20		14	42	6				Occasional gravel, becomes wet	NS	0.0
								SP	Gray medium to coarse sand with gravel (very dense, wet)		
	25		16	57	7					NS	0.0
								SP	Gray medium to coarse sand (very dense, wet)		
	30		16	48	8					NS	0.0
	35										

Note: See Figure A-1 for explanation of symbols.

WELL CONSTRUCTION



LOG OF MONITORING WELL 490150MW011

GEOENGINEERS

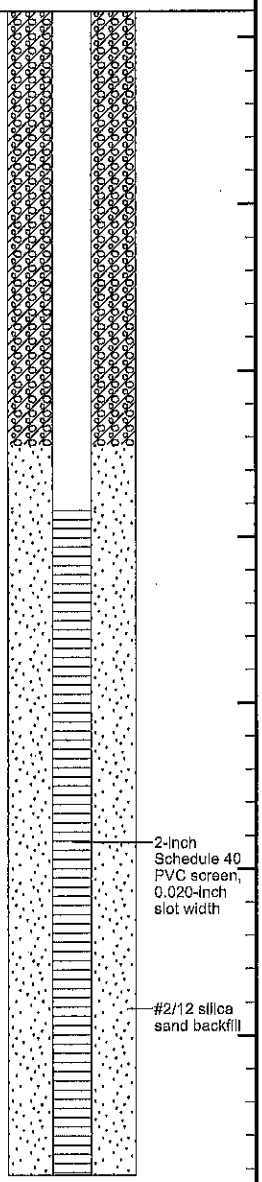
Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

Figure A-12
Sheet 1 of 2

V6 ENVWELL P:\0\0500147\00\FINALS\0500147\00.GPJ GEIV6 1.GDT 4/3/08

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	35		18	48	9					NS	0.0
								SW	Gray fine to coarse sand with occasional gravel (dense, wet)		
	40		2	41	10					NS	0.0
	45		18	56	11				Gravel absent, becomes very dense	NS	0.0
	50		9	72/9"	12				Occasional fine gravel	NS	0.0
	55		8	80/8"	13				Gravel absent	NS	0.0
								SP	Gray fine to medium sand (very dense, wet)		
	60		9	82/9"	14					NS	0.3
	65		18	36	15				Trace silt, becomes dense	NS	0.0
	70		18	52	16				Occasional gravel, becomes very dense	NS	0.0
	75										

WELL CONSTRUCTION



LOG OF MONITORING WELL 490150MW011 (continued)

GEOENGINEERS

Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

Figure A-12
Sheet 2 of 2

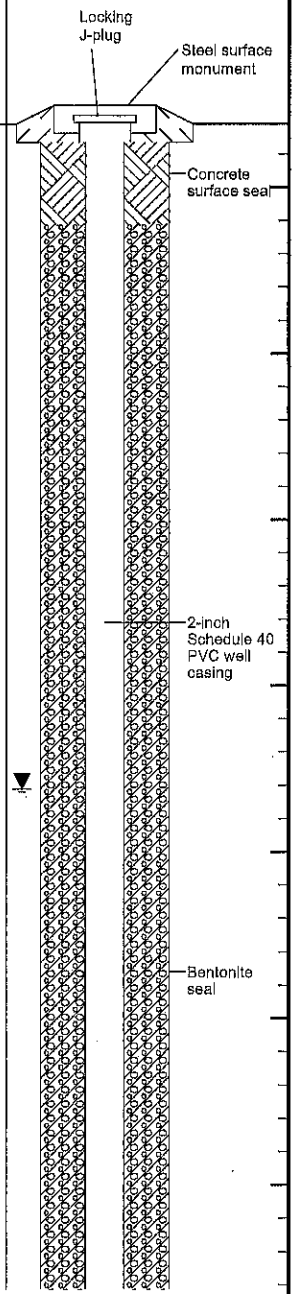
V6_ENVWELL P:\0\0500147\00\FINALS\050014700.GPJ GEIV6_1.GDT 4/3/08

Date(s) Drilled	01/15/08	Logged By	ARJ/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	CME 75	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted
Total Exploration Depth (ft)	71.5	Ground Surface Elevation (ft)	46.9	Groundwater Elevation (ft)	26.9
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1324969 248039.5

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample	Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0								SM	Dark brown silty sand with organic matter (loose, moist)		
									SP-SM	Brown medium to coarse sand with gravel and silt with trace wood fragments (medium dense, moist)		
	5	☒				1					NS	--
									GP-GM	Brown fine to coarse gravel with sand and silt (medium dense, moist)		
	10	■	10	12		2					NS	0.0
	15	■	10	21		3	CA			Grades to brownish gray	NS	0.0
									GP	Gray fine to coarse gravel with sand and trace silt (dense, wet)		
	20	■	14	31		4					NS	0.0
	25	■	6	50/6"		5				Grades to fine gravel, becomes very dense	NS	0.0
									SP	Gray medium to coarse sand with gravel and trace silt (very dense, wet)		
	30	■	11	67/11"		6					NS	0.0
	35											

Note: See Figure A-1 for explanation of symbols.

WELL CONSTRUCTION



LOG OF MONITORING WELL 490150MW012

GEOENGINEERS

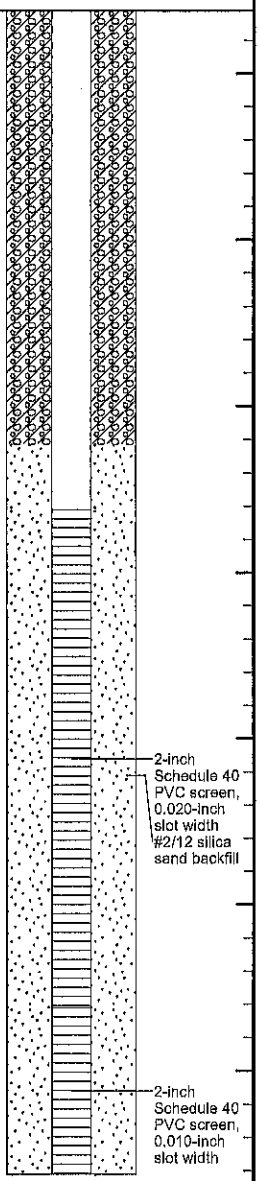
Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

Figure A-13
Sheet 1 of 2

V6 ENVWELL P:\0\0500147\00\FINALS\050014700.GPJ GEIV6_1.GDT 4/3/08

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	35		18	53	7				Grades to occasional gravel	NS	0.0
								SP	Gray medium sand with trace silt (dense, wet)		
	40		18	38	8					NS	0.0
	45		8	90/9"	9					NS	0.0
									Gray fine to medium sand with occasional gravel and trace silt (very dense, wet)		
	50		18	47	10					NS	0.0
									Gray medium sand with trace silt (dense, wet)		
	55		18	42	11					NS	0.0
									Grades to fine sand		
								SP-SM	Gray fine sand with silt (dense, wet)		
	60		18	46	12					NS	0.0
								SP	Gray fine to medium sand with trace silt (very dense, wet)		
	65		18	51	13					NS	0.0
	70		18	50	14					NS	0.0
	75										

WELL CONSTRUCTION



LOG OF MONITORING WELL 490150MW012 (continued)

GEOENGINEERS

Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

Figure A-13
Sheet 2 of 2

V6 ENVWELL P:\0\0500147\00\FINALS\050014700.GPJ GEIV6_1.GDT 4/3/08

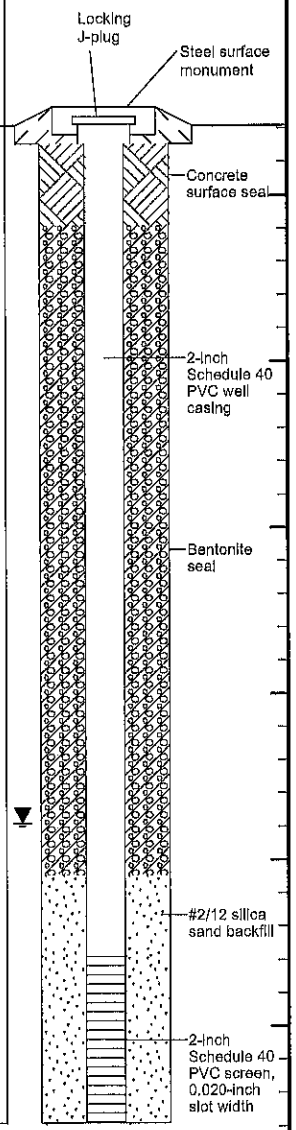
Date(s) Drilled	01/15/08	Logged By	ARJ/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	CME 75	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted
Total Exploration Depth (ft)	30	Ground Surface Elevation (ft)	47.1	Groundwater Elevation (ft)	26.1
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1324972.8 248038.1

Elevation feet	Depth feet	SAMPLES: Interval Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0						SM	Dark brown silty sand with organic matter (loose, moist)		
							SP-SM	Brown medium to coarse sand with gravel and silt with trace wood fragments (medium dense, moist)		
	5									
							GP-GM	Brown fine to coarse gravel with sand and silt (medium dense, moist)		
	10									
	15							Grades to brownish gray		
							GP	Gray fine to coarse gravel with sand and trace silt (dense, wet)		
	20									
	25							Grades to fine gravel, becomes very dense		
							SP	Gray fine gravel with sand and trace silt (very dense, wet)		
	30									
	35									

Note: Material descriptions are as recorded for MW012, 4 feet away

Note: See Figure A-1 for explanation of symbols.

WELL CONSTRUCTION



LOG OF MONITORING WELL 490150MW013

GEOENGINEERS

Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

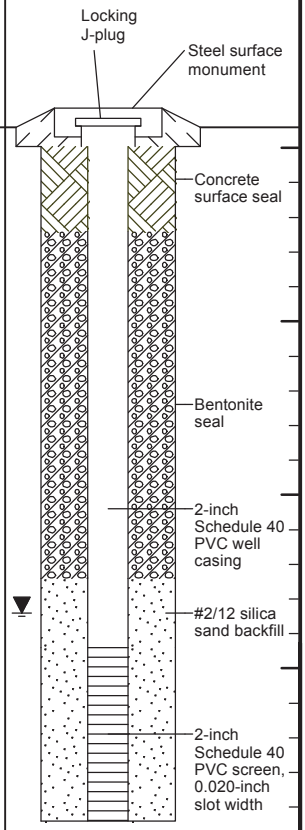
Figure A-14
Sheet 1 of 1

V6_ENVWELL P:\0\0500147\00\FINALS\0500147\00.GPJ GEIV6_1.GDT 4/3/08

Date(s) Drilled	10/31/07	Logged By	MSL/RNM	Checked By	RNM
Drilling Contractor	Cascade Drilling, Inc.	Drilling Method	CME 75	Sampling Methods	Dames & Moore
Auger Data	4¼-inch I.D.	Hammer Data	300 lb hammer/30 in drop	Drilling Equipment	Truck-mounted
Total Exploration Depth (ft)	21.5	Ground Surface Elevation (ft)	45.6	Groundwater Elevation (ft)	31.6
Vertical Datum	NGVD 29	Datum/ System	NAD 83	Easting(x): Northing(y):	1326044 248119.2

Elevation feet	Depth feet	SAMPLES Interval	Recovered (in)	Blows/foot	Sub-Sample Sample Number	Testing	Graphic Log	Group Symbol	MATERIAL DESCRIPTION	Sheen	Headspace Vapor PID (ppm)
	0							SM	Brown silty sand and occasional fine gravel (loose, moist)		
	5	☒			1					SS	--
								SM	Gray silty fine to medium sand (loose, moist)		
	10	■	10	8	2	CA				NS	1.1
								SP	Gray medium to coarse sand and trace silt (loose, wet)		
	15	■	14	9	3					NS	0.4
	20	■	8	53	4				Becomes very dense	NS	0.0
	25										
	30										
	35										

WELL CONSTRUCTION



Note: See Figure A-1 for explanation of symbols.

LOG OF MONITORING WELL 490170MW014

GEOENGINEERS

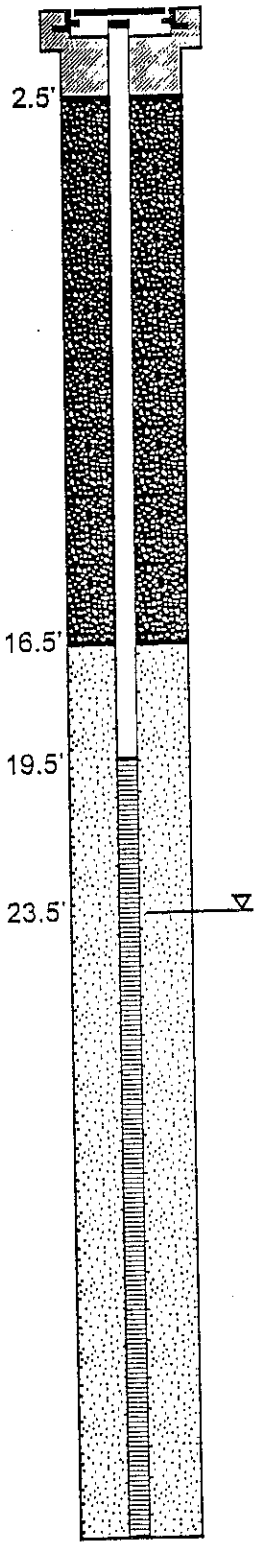
Project: City of Redmond
Project Location: Redmond, Washington
Project Number: 0500-147-00

Figure A-15
Sheet 1 of 1

V6_ENVWELL P:\0\0500147\00\FINALS\050014700.GPJ GEIV6_1.GDT 4/3/08

Equipment: Hollow Stem Auger

Land Surface Elevation: 48 feet Date: 9/2/97



OVM	Blows per Foot	Depth (feet)	Sample	
		0		Asphalt (3") BROWN SANDY GRAVEL (GP) very dense, moist; fine to coarse grained, with a trace of silt.
ND	100/0.5	5		
ND	50/0.4	10		With some cobbles.
ND	100/0.3	15		Sand becomes medium to coarse grained.
				Becomes wet. BROWN GRAVELLY SAND (SP) very dense, wet; medium to coarse grained, gravel is coarse grained, with a trace of silt.
0.9	90/0.5	20		
				Becomes saturated at 23.5' bgs.
ND	50/0.5	25		
		30		With some cobbles.
		35		BROWN SANDY GRAVEL (GP) very dense, saturated; coarse grained, sand is medium to coarse grained, with a trace of silt.
		40		

AGI TECHNOLOGIES

Log of Monitoring Well MW3 (MW052)

City of Redmond/Groundwater Investigation

Redmond, Washington

PLATE **3a**

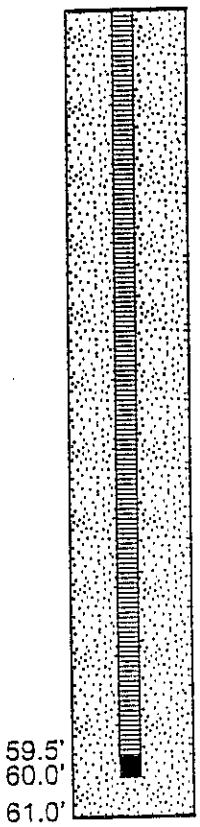
PROJECT NO.	DRAWN	DATE	APPROVED	REVISED	DATE
15,617.006	PJS	16 Sept 97			

15617006wl.cdr

Equipment Hollow Stem Auger

Land Surface Elevation 48 feet Date 9/2/97

OVM	Blows per Foot	Depth (feet)	Sample	
		40		
		45		
		50		
		55		BROWN GRAVELLY SAND (SP) dense, saturated; fine to medium grained, gravel is medium to coarse grained. With some silt.
		60		Boring terminated at 61.0' bgs. Groundwater encountered at 23.5' bgs.
		65		
		70		
		75		
		80		



AGI TECHNOLOGIES

Log of Monitoring Well MW3 (MW052)

City of Redmond/Groundwater Investigation

Redmond, Washington

PLATE **3b**

15617006wl.cdr	PROJECT NO. 15,617.006	DRAWN PJS	DATE 16 Sept 97	APPROVED	REVISED	DATE

Drilled	Start 5/6/2010	End 5/6/2010	Total Depth (ft) 26.5	Logged By MJP / Checked By CMK	Driller Boretec, Inc.	Drilling Method Hollow Stem Auger

Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	EC-55 Track-Mounted
Surface Elevation (ft) Vertical Datum	40.0	Top of Casing Elevation (ft)	
Easting (X) Northing (Y)		Horizontal Datum	

A 2 (in) well was installed on 5/6/2010 to a depth of 25 (ft).

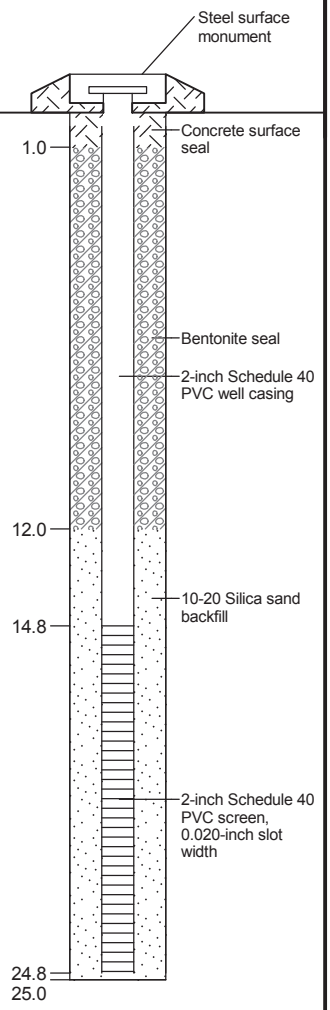
Groundwater Date Measured	Depth to Water (ft)	Elevation (ft)
5/12/2010	9.81	30.19

Notes: Auger Data: 4¼ inch I.D. 8¼ inch O.D.

FIELD DATA

Elevation (feet)	Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content, %	Dry Density, (pcf)
	0								CR	8 to 12 inches 5/8 minus crushed rock		
									ML	Brown silt with trace sand (medium stiff, moist)		
			15	5		1						
35	5		12	8		2				Grades to gray		
			12	8		3			SM	Brown silty fine to medium sand (loose, wet)		
30	10		18	3		4			ML	Bluish-gray silt with trace sand (soft, wet)		
									SP-SM	Gray fine to medium sand with silt (medium dense, wet)		
25	15		18	12		5						
20	20		18	21		6				SA; %F = 9	20	
										(Gravel)		
									SP-SM	Brown/gray fine to coarse sand with gravel and silt (medium dense, wet)		
15	25		15	16		7						

WELL LOG



Note: Please see Figure A-1 for explanation of symbols

Log of Monitoring Well B-3 MW329

GEOENGINEERS

Project: Bear Creek Water Quality Facility
Project Location: Redmond, Washington
Project Number: 0500-149-01

Figure A-3
Sheet 1 of 1

Redmond: Date:6/4/10 Path:W:\REDMOND\PROJECTS\0500149\01\GINT\050014901.GPJ DBTemplate/LibTemplate:GEOENGINEERS8.GDT/GEI8_GEOTECH_WELL

Drilled Start 12/15/2009	End 12/15/2009	Total Depth (ft) 26.5	Logged By RBM / Checked By CMK	Driller Boretec, Inc.	Drilling Method Hollow-Stem Auger

Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	EC-55 Track Mounted
Surface Elevation (ft) Vertical Datum	47.46 NAVD88	Top of Casing Elevation (ft)	47.38
Easting (X) Northing (Y)	1323671.5 248976.2	Horizontal Datum	NAD83

A 2 (in) well was installed on 12/15/2009 to a depth of 20.5 (ft).

Groundwater		
Date Measured	Depth to Water (ft)	Elevation (ft)
1/5/2010	17.9	29.58

Notes: Auger Data: 4 1/4 inch ID; 9 inch OD

FIELD DATA

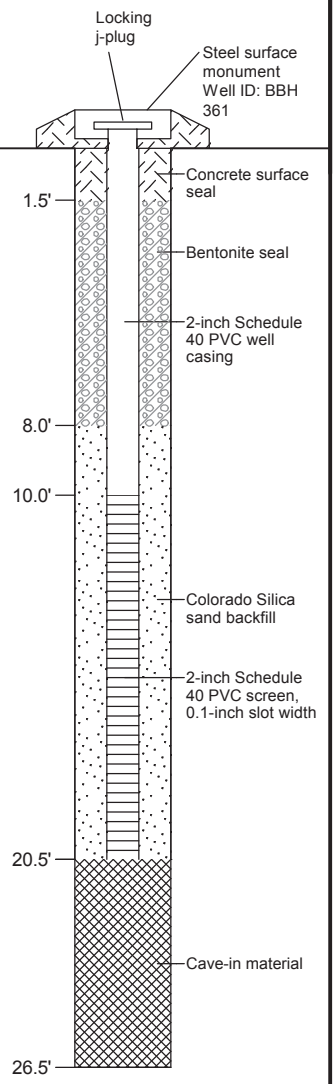
Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor
						AC	4 inches asphalt concrete		
						SM	Brown silty fine to coarse sand with gravel (medium dense, moist) (fill)		
						SP-SM	Brownish gray fine to medium sand with silt and occasional gravel (medium dense, moist)		
■	1	13		1					
■	11	17		2 SA			%F=9		
■	7	26		3			Rock fragments in sampler shoe (gravel/cobbles)		
■	3	28		4					
							Increased drilling resistance		
							Grades to very dense		
■	6	50/6"*		5	▽		Rock fragments in sampler shoe		
					▼	SW-SM	Brown and black fine to coarse sand with silt and gravel (medium dense, wet)		
■	6	11		6 SA			%F=7		
						GW	Brown and black fine to coarse gravel with sand and trace silt (dense, wet)		
■	8	21		7 SA			9 feet of heave measured after Sample No. 7 %F=3		

Elevation (feet): 45, 40, 35, 30, 25

Depth (feet): 0, 5, 10, 15, 20, 25

*Blow count may be overstated
Groundwater measured at 16 feet bgs (elevation 28 feet) at time of drilling

WELL LOG



Note: Please see Figure A-1 for explanation of symbols

Log of B-9 (550000MW340)

GEOENGINEERS

Project: Downtown/Redmond Way Stormwater Trunk
Project Location: Redmond, Washington
Project Number: 0500-149-02

Figure A-14
Sheet 1 of 1

Redmond: Date:2/2/10 Path:W:\REDMOND\PROJECTS\0050014902\GINT\0500149 02.GPJ DBTemplate\LibTemplate:GEOENGINEERS8.GDT/GEI8_ENVIRONMENTAL_WELL

Drilled	Start 12/18/2009	End 12/18/2009	Total Depth (ft)	26.5	Logged By	RBM	Checked By	CMK	Driller	Boretec, Inc.	Drilling Method	Hollow-Stem Auger

Hammer Data	Rope & Cathead 140 (lbs) / 30 (in) Drop	Drilling Equipment	EC-55 Track Mounted
Surface Elevation (ft) Vertical Datum	44.10 NAVD88	Top of Casing Elevation (ft)	43.89
Easting (X) Northing (Y)	1324929.9 247181.2	Horizontal Datum	NAD83

A 2 (in) well was installed on 12/20/2009 to a depth of 22.7 (ft).

Groundwater		
Date Measured	Depth to Water (ft)	Elevation (ft)
1/7/2009	12.3	31.77

Notes: Auger Data: 4 1/4 inch ID; 9 inch OD

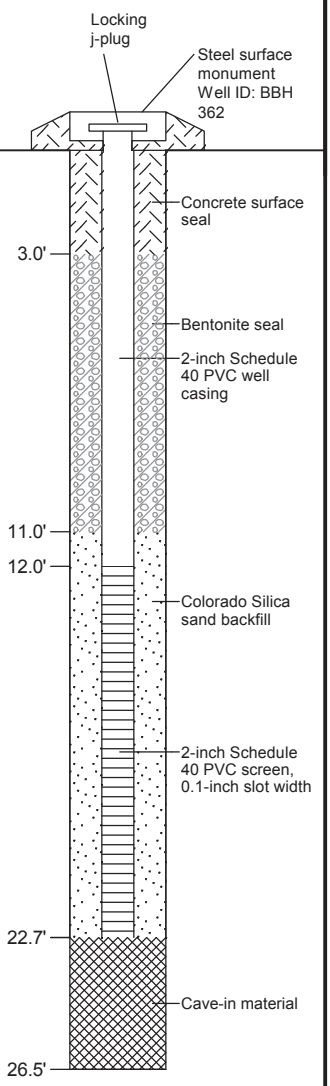
FIELD DATA

Depth (feet)	Interval	Recovered (in)	Blows/foot	Collected Sample	Sample Name	Water Level	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Sheen	Headspace Vapor
0								SM	Brownish gray silty fine to medium sand with occasional gravel (medium dense, moist) (fill)		
		9	5		1 MC						
5		11	7		2 SA			SM	Brownish gray silty fine to medium sand with occasional gravel (loose, moist) %F=25		
		11	10		3 AL			ML	Brownish gray silt with trace sand (stiff, moist)		
10		11	12		4			SP-SM	Brownish gray fine to medium sand with silt and occasional gravel (medium dense, moist) Drilling becomes harder at 11 feet bgs (gravel)		
15		6	47		5				Begin drilling with water head Rock fragments in sampler shoe		
								SP-SM	Brownish gray fine to coarse sand with silt and gravel (medium dense, wet)		
20		4	14		6 MC						
25		6	6		7 SA				%F=6		

Elevation (feet): 40, 35, 30, 25, 20

Groundwater measured at 16 feet bgs (elevation 24 feet) at time of drilling

WELL LOG



Note: Please see Figure A-1 for explanation of symbols

Log of B-5 (500000MW342)

GEOENGINEERS

Project: Downtown/Redmond Way Stormwater Trunk
Project Location: Redmond, Washington
Project Number: 0500-149-02

Figure A-16
Sheet 1 of 1

Redmond: Date:2/2/10 Path:W:\REDMOND\PROJECTS\0050014902\GINT\0500149 02.GPJ DBTemplate\LibTemplate:GEOENGINEERS8.GDT/GEI8_ENVIRONMENTAL_WELL

APPENDIX B

Water Quality Results

Table 2: Winter 2018 Groundwater Field Parameters and Total Metals Analytical Data

			Water Level[3]					Field Parameters[4]						Target Analyte List - Total Metals (µg/L)[1, 5]																	
Sample Location ID[2]	Date Sampled	Sample Identification	TOC Elevation (feet NAVD88)	Depth to Water (feet BTOC)	GS Elevation (NAVD88)	Depth to Water (feet BGS)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (mS/cm)	pH (standard units)	Dissolved Oxygen (mg/L)	ORP (relative mV)	Turbidity (NTU)	Aluminum	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Sodium	Vanadium	Zinc
MW002	2/1/2018	WGMW00220180201	33.19	6.40	33.66	6.87	26.79	10.0	0.074	**6.33**	0.15	225.8	0.75	110 U	3.3 U	28 U	4.4 U	7,800	11 U	11 U	11 U	56 U	1.1 U	4,400	**130**	22 U	1,300	5.6 U	5,300	11 U	28 U
MW003	2/5/2018	WGMW00320180205	38.66	16.41	38.82	16.57	22.25	13.6	0.176	**6.36**	4.10	279.6	9.12	380	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	**460**	1.1 U	10,000	15	22 U	1,700	5.6 U	11,000	11 U	28 U
MW004	2/5/2018	WGMW00420180205	38.67	13.79	39.01	14.13	24.88	13.5	0.181	**6.43**	5.77	255.5	0.60	110 U	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	1,900	5.6 U	11,000	11 U	28 U
MW008	2/5/2018	WGMW00820180205	47.99	19.43	48.40	19.84	28.56	12.4	0.158	**6.49**	4.60	203.0	*	110 U	3.3 U	28 U	4.4 U	15,000	11 U	11 U	11 U	77	1.1 U	9,500	**67**	22 U	1,700	5.6 U	11,000	11 U	28 U
MW009	2/2/2018	WGMW00920180202	48.11	19.73	48.52	20.14	28.38	12.3	0.179	**6.30**	5.69	296.5	22.9	620	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	**700**	1.1 U	11,000	30	22 U	2,000	5.6 U	11,000	11 U	28 U
MW010	1/31/2018	WGMW01020180131	50.05	21.91	50.50	22.59	28.14	12.6	0.174	**6.38**	1.86	204.5	1.99	110 U	3.3 U	28 U	4.4 U	18,000	11 U	11 U	11 U	56 U	1.1 U	12,000	**74**	22 U	1,900	5.6 U	11,000	11 U	28 U
MW011	1/31/2018	WGMW01120180131	49.19	20.95	49.39	21.15	28.24	11.9	0.164	**6.48**	1.55	199.7	0.07	110 U	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	1,900	5.6 U	11,000	11 U	28 U
MW012	2/2/2018	WGMW01220180202	50.22	21.15	50.56	21.49	29.07	12.1	0.194	6.72	0.20	94.8	287	880	**190**	73	4.4 U	19,000	11 U	24	11 U	**63,000**	1.1 U	16,000	**1,500**	36	2,200	5.6 U	11,000	260	28 U
MW013	2/2/2018	WGMW01320180202	50.40	21.43	50.70	21.74	28.97	13.1	0.177	**6.41**	5.77	277.6	13.8	250	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	**710**	1.1 U	12,000	**77**	22 U	2,100	5.6 U	10,000	11 U	28 U
MW014	2/6/2018	WGMW01420180206	48.59	9.45	49.25	10.11	39.14	12.2	0.271	**6.40**	0.20	-40.5	16.8	110 U	**12**	28 U	4.4 U	22,000	11 U	11 U	11 U	**21,000**	1.1 U	15,000	**2,400**	22 U	1100 U	5.6 U	6,500	11 U	28 U
MW015	2/2/2018	WGMW01520180202	59.15	11.48	59.95	12.28	47.67	10.9	0.079	6.60	8.36	121.7	64.3	660	3.3 U	28 U	4.4 U	20,000	11 U	11 U	11 U	**6,000**	1.1 U	4,300	**290**	22 U	1,400	5.6 U	2,500	11 U	160
MW018	2/7/2018	WGMW01820180207	48.00	6.12	48.25	6.37	41.88	12.4	0.158	6.50	6.20	264.7	1.49	110 U	3.3 U	28 U	4.4 U	16,000	11 U	11 U	11 U	56 U	1.1 U	7,000	11 U	22 U	3,100	5.6 U	10,000	11 U	28 U
MW022	2/7/2018	WGMW02220180207	50.60	4.60	50.85	4.85	46.00	11.3	0.378	**5.89**	0.17	10.0	4.92	110 U	**12**	76	4.4 U	25,000	11 U	11	11 U	**54,000**	1.1 U	8,800	**4,200**	22 U	3,900	5.6 U	13,000	11 U	28 U
MW024	2/6/2018	WGMW02420180206	74.11	8.79	74.54	9.22	65.32	11.5	0.195	**6.19**	1.80	271.2	0.30	110 U	3.3 U	28 U	4.4 U	23,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	2,600	5.6 U	7,500	11 U	28 U
MW025	2/2/2018	WGMW02520180202	63.37	11.25	60.75	8.64	52.12	11.4	0.129	**6.42**	0.57	216.0	0.89	110 U	3.3 U	28 U	4.4 U	16,000	11 U	11 U	11 U	56 U	1.1 U	6,200	25	22 U	1,800	5.6 U	9,200	11 U	28 U
MW027	2/1/2018	WGMW02720180201	33.26	6.41	33.58	6.73	26.85	11.2	0.128	6.56	0.16	26.6	0.80	110 U	3.3 U	28 U	4.4 U	11,000	11 U	11 U	12	**1,200**	1.1 U	9,000	**92**	22 U	1,400	5.6 U	7,400	11 U	28 U
MW031	2/5/2018	WGMW03120180205	33.57	9.35	34.21	9.99	24.22	13.2	0.189	**6.20**	0.24	242.1	0.19	110 U	3.3 U	28 U	4.4 U	19,000	11 U	11 U	11 U	56 U	1.1 U	12,000	11 U	22 U	1,800	5.6 U	12,000	11 U	28 U
MW033	2/1/2018	WGMW03320180201	38.91	16.70	39.12	16.91	22.21	13.4	0.173	**6.18**	0.18	230.3	0.47	110 U	3.3 U	28 U	4.4 U	18,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	1,900	5.6 U	12,000	11 U	28 U
MW033	2/1/2018	WGMW03320180201D	-	-	-	-	-	-	-	**-**	-	-	-	110 U	3.3 U	28 U	4.4 U	18,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	2,000	5.6 U	11,000	11 U	28 U
MW036	2/5/2018	WGMW03620180205	37.88	15.37	--	--	22.51	13.5	0.200	**6.24**	0.28	260.7	0.59	110 U	3.3 U	28 U	4.4 U	20,000	11 U	11 U	11 U	56 U	1.1 U	13,000	11 U	22 U	2,000	5.6 U	13,000	11 U	28 U
MW044	2/6/2018	WGMW04420180206	45.42	17.24	45.82	17.64	28.18	13.4	0.190	**5.94**	3.97	276.4	0.34	110 U	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	56 U	1.1 U	9,000	11 U	22 U	2,000	5.6 U	13,000	11 U	28 U
MW088	2/6/2018	WGMW08820180206	40.85	12.88	41.15	13.18	27.97	13.9	0.190	**6.30**	1.16	265.8	0.13	110 U	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	2,100	5.6 U	11,000	11 U	28 U
MW111	2/7/2018	WGMW11120180207	47.76	9.09	48.35	9.68	38.67	12.6	0.158	**6.30**	5.11	267.6	1.50	110 U	3.3 U	28 U	4.4 U	15,000	11 U	11 U	11 U	56 U	1.1 U	6,900	11 U	22 U	6,100	5.6 U	9,900	11 U	28 U
MW321	2/1/2018	WGMW32120180201	32.87	4.76	33.44	5.33	28.11	13.3	0.209	**6.35**	0.18	33.9	2.18	110 U	3.3 U	28 U	4.4 U	19,000	11 U	11 U	11 U	**1,900**	1.1 U	12,000	**1,200**	22 U	2,100	5.6 U	12,000	11 U	28 U
MW322	2/1/2018	WGMW32220180201	36.99	8.97	37.50	9.48	28.02	12.5	0.152	**6.38**	0.14	158.7	2.14	110 U	3.3 U	28 U	4.4 U	14,000	11 U	11 U	11 U	56 U	1.1 U	8,900	**140**	22 U	1,700	5.6 U	9,400	11 U	28 U
MW327	1/31/2018	WGMW32720180131	43.07	14.28	43.34	14.55	28.79	11.9	0.137	**6.43**	0.17	5.0	3.76	110 U	**14**	28 U	4.4 U	14,000	11 U	11 U	11 U	**3,900**	1.1 U	7,700	**340**	22 U	1,700	5.6 U	8,500	11 U	28 U
MW337	1/31/2018	WGMW33720180131	72.65	23.08	73.13	23.56	49.57	11.1	0.116	**6.31**	5.54	261.5	0.16	110 U	3.3 U	28 U	4.4 U	14,000	11 U	11 U	11 U	56 U	1.1 U	5,200	11 U	22 U	1,800	5.6 U	8,500	11 U	28 U
MW341	1/31/2018	WGMW34120180131	43.21	15.15	43.72	15.66	28.06	12.6	0.143	**6.08**	4.90	184.1	13.1	110 U	3.3 U	28 U	4.4 U	12,000	11 U	11 U	11 U	**1,800**	1.1 U	6,100	42	22 U	2,000	5.6 U	15,000	11 U	28 U
MW354	2/6/2018	WGMW35420180206	64.25	6.07	64.50	6.32	58.18	10.0	0.112	**6.34**	0.14	257.1	0.23	110 U	3.3 U	28 U	4.4 U	13,000	11 U	11 U	11 U	56 U	2.9	6,000	11 U	22 U	1100 U	5.6 U	6,300	11 U	28 U
MW391	2/5/2018	WGMW39120180205	34.72	9.32	35.04	9.64	25.40	13.8	0.181	**6.42**	1.34	255.3	0.37	110 U	3.3 U	28 U	4.4 U	17,000	11 U	11 U	11 U	56 U	1.1 U	11,000	11 U	22 U	2,100	5.6 U	12,000	11 U	28 U
MW393	2/6/2018	WGMW39320180206	41.15	13.02	41.50	13.37	28.13	12.5	0.185	**6.22**	4.11	270.0	0.71	110 U	3.3 U	28 U	4.4 U	18,000	11 U	11 U	11 U	56 U	1.1 U	10,000	11 U	22 U	2,100	5.6 U	10,000	11 U	28 U
Field Blank[9]	2/7/2018	FB20180207	-	-	-	-	-	-	-	-	-	-	-	110 U	3.3 U	28 U	4.4 U	1100 U	11 U	11 U	11 U	56 U	1.1 U	1100 U	11 U	22 U	1100 U	5.6 U	1100 U	11 U	28 U
Screening Level		Department of Ecology Criteria[7]	-	-			-	-	-	6.5-8.5	-	-	-	--	5[10]	1,000	10	--	50	--	1,000	300	50	--	50	--	--	10	--	--	5,000
		Department of Health MCLs[8]	-	-			-	-	0.70	-	-	-	-	--	10	2,000	5	--	100	--	1,300	300	15	--	50	100	--	50	--	--	5,000
															196																

Abbreviations:

5	Bolded result exceeds Screening Level (SL)
-	Not measured or not available
°C	Degrees Celsius
feet BGS	Feet below ground surface
feet BTOC	Feet below measuring point (top of casing)
MCL	Maximum Containment Level
mg/L	Milligrams per liter
mS/cm	Millisiemens per centimeter
mV	Milli-Volts
NTU	Nephelometric Turbidity Unit
TOC	Top of casing inside PVC well
U	Analyte not detected above the reporting limit shown
µg/L	Micrograms per liter

Notes:

1. Chemical analyses conducted by OnSite Environmental of Redmond, Washington.
2. The first six digits of the monitoring well identification have been omitted.
3. Groundwater levels are presented as the depth beneath the top of the PVC well casing (TOC) and the depth below ground surface (BGS). Measurements represent static water levels before sampling. Water levels measured during synoptic event are presented on Table 5.
4. Field-measured parameters include temperature (T), conductivity (Cond.), pH, dissolved oxygen (DO), oxidation-reduction potential (EH/ORP) and turbidity.
5. Target Analyte List (TAL) of total metals analyzed by EPA Methods 200.8/6010C . Selected wells were analyzed only for the TAL metals short list which excludes Sb, Be, Se, Ag, and Tl. The Trip Blank samples were not analyzed for TAL total metals.
6. Groundwater sample WGMW03320180201D is a field duplicate from well MW033.
7. Groundwater Quality Criteria (Criteria) used by the Washington State Department of Ecology are based on Chapter 173-200 Washington Administrative Code (WAC).
8. Maximum Contaminant Levels (MCLs) used by the Washington State Department of Health are based on Chapter 246-290 WAC and EPA's "National Primary Drinking Water Regulations," dated May 2009.
9. Field Blank was collected by pumping lab-prepared DI into sample bottles.
10. Model Toxics Control Act (MTCA) Method A value for Washington.

Table 3: Winter 2018 Chemical Analytical Data[1]

Sample Location ID[2]	Date Sampled	Sample Identification	Total Petroleum Hydrocarbons by NWTPH-HCID (mg/L)			VOCs by EPA 8260C (µg/L)[3]			Contaminants of Emerging Concern (CECs)[3,6]		Conventionals (mg/L)[5]								Microbiological (CFU/100 mL)[7,8]		
			Gasoline Range	Diesel Range	Lube Oil Range	Acetone	Chloroform	Tetrachloroethene[4]	Perfluorooctanoic Acid (PFOA) (ng/L)	Perfluorooctane Sulfonate (PFOS) (ng/L)	Bicarbonate (mg/L CaCO3)	Chloride	Fluoride	Nitrate (as N)	Sulfate	TDS	Total Organic Carbon (TOC)	Total Alkalinity (mg/L CaCO3)	Total Coliforms	Fecal Coliforms	*E. coli*
MW002	1/31/2018	WGMW00220180201	-	-	-	5 U	0.2 U	0.2 U	-	-	40	4.8	0.057	0.05 U	11	56	2.6	40	-	-	-
MW003	2/5/2018	WGMW00320180205	-	-	-	5 U	0.2 U	**2.3**	-	-	78	8.2	0.029	1.80	14	150	-	-	-	-	-
MW004	2/5/2018	WGMW00420180205	0.10 U	0.26 U	0.41 U	5 U	0.30	0.2 U	-	-	78	8.9	0.029	1.70	14	150	-	-	-	-	-
MW008	2/5/2018	WGMW00820180205	-	-	-	5 U	0.35	0.2 U	-	-	76	7.2	0.033	0.98	17	120	1 U	76	-	-	-
MW009	2/2/2018	WGMW00920180202	0.10 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	-	-	82	13	0.024	1.60	17	140	1 U	82	-	-	-
MW010	1/31/2018	WGMW01020180131	0.10 U	0.26 U	0.41 U	5 U	0.2 U	0.2 U	-	-	100	7.7	0.045	0.13	14	120	1 U	100	**2**	2 U	2 U
MW011	1/31/2018	WGMW01120180131	0.10 U	0.26 U	0.41 U	5 U	0.2 U	0.2 U	-	-	100	5.9	0.026	0.90	13	15	-	-	-	-	-
MW012	2/2/2018	WGMW01220180202	-	-	-	5 U	0.2 U	0.2 U	-	-	130	6.9	0.025	0.23	25 U	160	1 U	130	-	-	-
MW013	2/2/2018	WGMW01320180202	-	-	-	5 U	0.2 U	0.2 U	-	-	98	6.1	0.030	1.30	13	140	1 U	98	-	-	-
MW014	2/6/2018	WGMW01420180206	0.11 U	0.27 U	0.44 U	5 U	0.2 U	0.2 U	-	-	140	4.6	0.071	0.57	10 U	230	-	-	-	-	-
MW015	2/2/2018	WGMW01520180202	-	-	-	5 U	0.2 U	0.2 U	-	-	88	2.3	0.020	0.27	5 U	96	-	-	-	-	-
MW018	2/7/2018	WGMW01820180207	0.10 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	-	-	78	10	0.039	0.4 J+	7.7	160	-	-	-	-	-
MW022	2/7/2018	WGMW02220180207	0.10 U	0.26 U	0.41 U	5 U	0.2 U	0.2 U	-	-	170	13	0.025	0.31	5 U	280	-	-	-	-	-
MW024	2/6/2018	WGMW02420180206	-	-	-	5 U	**9.10**	0.2 U	-	-	100	4.7	0.036	1.40	16	160	-	-	-	-	-
MW025	2/2/2018	WGMW02520180202	-	-	-	5 U	0.2 U	0.2 U	-	-	78	4.7	0.037	0.39	8.4	83	-	-	-	-	-
MW027	2/1/2018	WGMW02720180201	-	-	-	5 U	0.2 U	0.2 U	-	-	80	5.9	0.048	0.087 J+	7.1	95	1.9	80	-	-	-
MW031	2/5/2018	WGMW03120180205	-	-	-	5 U	0.2 U	0.69	-	-	98	6.0	0.028	0.32	14	130	1 U	98	-	-	-
MW033	2/1/2018	WGMW03320180201	-	-	-	5 U	0.2 U	0.72	-	-	100	7.5	0.025	0.11	9.6	130	2.0	100	1 U	2 U	1 U
MW033	2/1/2018	WGMW03320180201D	-	-	-	5 U	0.2 U	0.70	-	-	100	7.9	0.029	0.07	9.7	120	2.0	100	1 U	2 U	1 U
MW036	2/5/2018	WGMW03620180205	-	-	-	5 U	0.2 U	0.32	-	-	100	8.1	0.030	0.17	14	120	-		-	-	-
MW044	2/6/2018	WGMW04420180206	-	-	-	5 U	0.33	0.23	6.6	4.6 U	74	5.7	0.031	4.0	20	180	1.3	74	-	-	-
MW088	2/6/2018	WGMW08820180206	-	-	-	5 U	0.2 U	0.78	-	-	90	6.3	0.038	1.60	13	170	1.1	90	-	-	-
MW111	2/7/2018	WGMW11120180207	0.10 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	-	-	82	7.9	0.053	0.49 J+	5.5	160	-	-	-	-	-
MW321	2/1/2018	WGMW32120180201	-	-	-	5 U	0.2 U	0.2 U	1.8 U	4.6 U	120	9.8	0.025	0.05	12	150	2.1	120	-	-	-
MW322	2/1/2018	WGMW32220180201	-	-	-	5 U	0.2 U	0.27	1.8 U	5.9	88	7.0	0.024	0.05 U	12	110	1.1	88	-	-	-
MW327	1/31/2018	WGMW32720180131	-	-	-	5 U	0.2 U	0.2 U	6.7	7.9	72	9.9	0.026	0.21	11	53	1.7	72	-	-	-
MW337	1/31/2018	WGMW33720180131	-	-	-	5 U	0.2 U	0.2 U	-	-	58	5.2	0.027	2.20	9.7	85	-	-	1 U	2 U	2 U
MW341	1/31/2018	WGMW34120180131	-	-	-	5 U	0.2 U	0.2 U	7.2	7.6	46	17	0.02 U	1.20	21	120	2.0	46	-	-	-
MW354	2/6/2018	WGMW35420180206	-	-	-	5 U	0.2 U	0.2 U	-	-	66	4.1	0.036	0.31	6.8	110	1 U	66	-	-	-
MW391	2/5/2018	WGMW39120180205	-	-	-	5 U	0.2 U	0.2 U	-	-	86	8.2	0.030	0.81	15	37	1 U	86	-	-	-
MW393	2/6/2018	WGMW39320180206	-	-	-	5 U	0.2 U	0.76	-	-	86	11	0.035	1.90	12	150	1 U	86	-	-	-
Trip Blank	1/31/2018	TripBlank20180131	-	-	-	5 U	0.2 U	0.2 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	2/1/2018	TripBlank20180201	-	-	-	5 U	0.2 U	0.2 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	2/2/2018	TripBlank20180202	-	-	-	5 U	0.2 U	0.2 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	2/5/2018	TripBlank20180205	-	-	-	5 U	0.2 U	0.2 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	2/6/2018	TripBlank20180207	-	-	-	5 U	0.2 U	0.2 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	2/7/2018	TripBlank20180206	-	-	-	5 U	0.2 U	0.2 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Blank[10]	2/7/2018	FB20180207	0.10 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	1.8 U	4.6 U	2 U	2 U	0.02 U	0.40	5 U	13 U	1 U	2 U	-	-	-
Screening Level	Department of Ecology Criteria[11]		-	-	-	-	7.0	0.80	70[13]	70[13]	-	250	4.0	10	250	500			1	-	-
	Department of Health MCLs[12]		-	-	-	-	-	5.0	-	-	-	250	4.0	10	250	500			1	1	1

Abbreviations:

5	Bolded result exceeds Screening Level (SL)
-	Not measured or not available
CFU	Colony Forming Units
EPA	Environmental Protection Agency
HCID	Hydrocarbon Identification Scan
J+	Estimated value, high bias.
MCL	Maximum Containment Level
mg/L	Milligrams per liter
mL	Milliliter
MPN	Most Probably Number
N	Nitrogen
NWTPH	Northwest Total Petroleum Hydrocarbons
PPCP	Pharmaceuticals and Personal Care Products
SIM PAH	Selective Ion Monitoring Polycyclic Aromatic Hydrocarbons
SVOC	Semi-Volatile Organic Compounds
U	Analyte not detected above the reporting limit shown
VOC	Volatile Organic Compounds
µg/L	Micrograms per liter

Notes:

1. Chemical analyses conducted by OnSite Environmental of Redmond, Washington, Am Test Inc. of Kirkland, Washington, ALS of Kelso, Washington, and Pacific Agricultural Laboratory of Sherwood, Oregon
2. The first six digits of the monitoring well identification shown in Table 1 have been omitted.
3. Only the detected analytes are listed for VOCs, SVOCs, and CECs. Refer to the laboratory reports for a complete list of analytes and detection limits.
4. Tetrachloroethene (CAS No. 127-18-4) is also known as Tetrachloroethylene and Perchloroethene (PCE).
5. Bicarbonate analyzed by standard method (SM) 2320B. Chloride analyzed by SM 4500-CL. Fluoride analyzed by SM 4500-FC. Nitrate analyzed by EPA Method 353.2. Sulfate analyzed by Method ASTM D516-07, Total Dissolved Solids analyzed by SM 2540C. Phosphorous analyzed by EPA Method 365.1.
6. Glyphosate and AMPA area analyzed by EPA Method 547
7. Total Coliforms analyzed by SM 9222B. Fecal Coliforms and E. coli analyzed by SM 9222 Calculation.
8. Units are CFU/100 mL.
9. Groundwater sample WGMW03320180201D is a field duplicate from well MW033
10. Field Blank was collected by pumping lab-prepared DI into sample bottles using new tubing.
11. Groundwater Quality Criteria (Criteria) used by the Washington State Department of Ecology are based on Chapter 173-200 Washington Administrative Code (WAC).
12. Maximum Contaminant Levels (MCLs) used by the Washington State Department of Health are based on Chapter 246-290 WAC and EPA's "National Primary Drinking Water Regulations," dated
13. United States Environmental Protection Agency's (EPA) Drinking Water Health Advisory for PFOA and PFOS.
14. Model Toxics Control Act (MTCA) Method B value for Washington.

Table 2: Summer 2018 Groundwater Field Parameters and Total Metals Analytical Data

			Water Level[3]			Field Parameters[4]						Target Analyte List - Total Metals (µg/L)[1, 5]																	
Sample Location ID[2]	Date Sampled	Sample Identification	TOC Elevation (feet NAVD88)	Depth to Water (feet BTOC)	Groundwater Elevation (feet NAVD88)	Temperature (°C)	Conductivity (mS/cm)	pH (standard units)	Dissolved Oxygen (mg/L)	ORP (relative mV)	Turbidity (NTU)	Aluminum	Arsenic	Barium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Sodium	Vanadium	Zinc
MW003	8/2/2018	WGMW00320180802	38.66	17.44	21.22	12.0	0.171	**6.40**	5.45	212.0	0.15	110 U	3.3 U	28 U	4.4 U	16000	11 U	11 U	11 U	56 U	1.1 U	9600	11 U	22 U	1600	5.6 U	9900	11 U	28 U
MW003	8/2/2018	WGMW00320180802DUP[6]	-	-	-	-	-	**-**	-	-	-	110 U	3.3 U	28 U	4.4 U	16000	11 U	11 U	11 U	56 U	1.1 U	9700	11 U	22 U	1600	5.6 U	10000	11 U	28 U
MW004	8/2/2018	WGMW00420180802	38.67	18.10	20.57	13.3	0.203	**6.31**	4.44	203.9	0.97	110 U	3.3 U	28 U	4.4 U	17000	11 U	11 U	11 U	56 U	1.1 U	11000	11 U	22 U	2000	5.6 U	11000	11 U	28 U
MW010	7/30/2018	WGMW01020180730	49.82	25.82	24.00	12.9	0.170	**6.24**	5.31	117.9	0.62	110 U	3.3 U	28 U	4.4 U	17000	11 U	11 U	11 U	56 U	1.1 U	11000	11 U	22 U	1800	5.6 U	9700	11 U	28 U
MW011	8/7/2018	WGMW01120180807	49.19	26.10	23.09	10.8	0.155	**6.45**	1.40	123.6	0.20	110 U	3.3 U	28 U	4.4 U	15000	11 U	11 U	11 U	56 U	1.1 U	11000	11 U	22 U	1800	5.6 U	10000	11 U	28 U
MW012	8/7/2018	WGMW01220180807	50.22	26.02	24.20	11.7	0.198	6.77	0.93	98.6	33.40	110 U	**6.9**	28 U	4.4 U	17000	11 U	11 U	11 U	**2000**	1.1 U	17000	**69**	22 U	2100	5.6 U	12000	11 U	28 U
MW012	8/7/2018	WGMW01220180807DUP[6]	-	-	-	-	-	**-**	-	-	-	110 U	**9.3**	28 U	4.4 U	17000	11 U	11 U	11 U	**3200**	1.1 U	17000	**99**	22 U	2000	5.6 U	12000	16	28 U
MW013	8/7/2018	WGMW01320180807	50.40	25.82	24.58	12.4	0.184	**6.47**	4.66	101.1	1.76	110 U	3.3 U	28 U	4.4 U	17000	11 U	11 U	11 U	56 U	1.1 U	13000	11 U	22 U	1800	5.6 U	9700	11 U	28 U
MW014	8/6/2018	WGMW01420180806	48.59	13.67	34.92	10.7	0.281	**6.41**	2.02	-26.2	6.89	210	**11**	29	4.4 U	13000	11 U	11 U	11 U	**12000**	1.1 U	8800	**1300**	22 U	1100 U	5.6 U	6000	11 U	28 U
MW015	8/7/2018	WGMW01520180807	59.15	19.56	39.59	11.5	0.449	**6.00**	5.43	78.3	68.6	110 U	**5.7**	38	4.4 U	39000	11 U	11 U	11 U	**16000**	1.1 U	45000	**2000**	22 U	2100	5.6 U	14000	11 U	46
MW017	8/2/2018	WGMW00320180802	52.15	17.33	34.82	10.2	0.105	**6.39**	0.96	63.1	0.55	110 U	3.3 U	28 U	4.4 U	11000	11 U	11 U	11 U	**2500**	1.1 U	5500	**130**	22 U	1200	5.6 U	6000	11 U	28 U
MW018	8/6/2018	WGMW01820180806	48.00	12.83	35.17	11.4	0.147	6.51	5.10	58.1	0.05	110 U	3.3 U	28 U	4.4 U	17000	11 U	11 U	11 U	56 U	1.1 U	7300	11 U	22 U	3200	5.6 U	9800	11 U	28 U
MW020	8/6/2018	WGMW02020180806	50.47	12.72	37.75	12.4	0.161	6.59	4.45	82.8	0.19	110 U	3.3 U	28 U	4.4 U	18000	11 U	11 U	11 U	56 U	1.1 U	7500	11 U	22 U	3000	5.6 U	11000	11 U	28 U
MW023	8/3/2018	WGMW02320180803	73.73	25.16	48.57	10.4	0.150	**6.47**	3.68	188.4	0.85	110 U	**5.4**	28 U	4.4 U	18000	11 U	11 U	11 U	56 U	1.1 U	8000	11 U	22 U	2300	5.6 U	9500	11 U	28 U
MW024	8/3/2018	WGMW02420180803	74.11	13.03	61.08	12.9	0.196	**6.25**	1.77	206.4	0.32	110 U	3.3 U	28 U	4.4 U	22000	11 U	11 U	11 U	56 U	1.1 U	11000	11 U	22 U	2500	5.6 U	7200	11 U	28 U
MW024	8/3/2018	WGMW02420180803DUP[6]	-	-	-	-	-	**-**	-	-	-	110 U	3.3 U	28 U	4.4 U	23000	11 U	11 U	11 U	56 U	1.1 U	11000	11 U	22 U	2500	5.6 U	7200	11 U	28 U
MW027	8/1/2018	WGMW02720180801	33.26	10.91	22.35	11.0	0.130	6.50	1.41	87.5	0.43	110 U	3.3 U	28 U	4.4 U	12000	11 U	11 U	11 U	**1100**	1.1 U	9000	**94**	22 U	1400	5.6 U	7300	11 U	28 U
MW030	8/1/2018	WGMW03020180801	32.82	10.61	22.21	10.1	0.109	**6.35**	1.24	129.1	3.51	110 U	3.3 U	28 U	4.4 U	10000	11 U	11 U	11 U	150	1.1 U	6400	**210**	22 U	1300	5.6 U	9100	11 U	28 U
MW031	8/3/2018	WGMW03120180803	33.57	11.48	22.09	12.0	0.133	**6.29**	0.92	181.1	0.82	110 U	3.3 U	28 U	4.4 U	12000	11 U	11 U	11 U	56 U	1.1 U	8000	11 U	22 U	1300	5.6 U	9200	11 U	28 U
MW033	7/30/2018	WGMW03320180730	38.91	17.10	21.81	14.0	0.129	**5.90**	0.54	80.8	0.61	110 U	3.3 U	28 U	4.4 U	12000	11 U	11 U	11 U	56 U	1.1 U	7400	11 U	22 U	1400	5.6 U	8700	11 U	28 U
MW111	8/1/2018	WGMW11120180801	47.76	16.19	31.57	11.0	0.157	**6.38**	2.90	100.1	0.30	110 U	3.3 U	28 U	4.4 U	15000	11 U	11 U	11 U	56 U	1.1 U	6800	11 U	22 U	5700	5.6 U	10000	11 U	28 U
MW321	7/30/2018	WGMW32120180730	32.87	13.03	19.84	15.6	0.214	**6.34**	0.38	17.3	0.34	110 U	3.3 U	28 U	4.4 U	21000	11 U	11 U	11 U	**680**	1.1 U	11000	**1000**	22 U	1900	5.6 U	12000	11 U	28 U
MW322	7/30/2018	WGMW32220180730	36.99	23.65	13.34	15.0	0.185	**6.15**	0.22	95.9	0.33	110 U	3.3 U	28 U	4.4 U	18000	11 U	11 U	11 U	56 U	1.1 U	10000	27	22 U	1700	5.6 U	11000	11 U	28 U
MW327	7/30/2018	WGMW32720180730	43.07	22.04	21.03	14.7	0.199	**6.26**	0.46	-14.6	9.51	110 U	**14**	28 U	4.4 U	19000	11 U	11 U	11 U	**4800**	1.1 U	11000	**450**	22 U	1800	5.6 U	9900	11 U	28 U
MW331	8/2/2018	WGMW33120180802	40.27	20.77	19.50	12.1	0.177	**6.38**	4.75	220.5	0.21	110 U	3.3 U	28 U	4.4 U	15000	11 U	11 U	11 U	56 U	1.1 U	10000	11 U	22 U	1700	5.6 U	9900	11 U	28 U
MW337	8/1/2018	WGMW33720180801	72.65	27.01	45.64	10.0	0.125	**6.33**	6.29	95.8	0.09	110 U	3.3 U	28 U	4.4 U	14000	11 U	11 U	11 U	56 U	1.1 U	5400	11 U	22 U	1700	5.6 U	8000	11 U	28 U
MW343	8/2/2018	WGMW34320180802	39.93	21.23	18.70	12.2	0.228	**6.23**	1.20	218.8	0.53	110 U	3.3 U	28 U	4.4 U	25000	11 U	11 U	11 U	56 U	1.1 U	12000	**130**	22 U	2300	5.6 U	12000	11 U	28 U
MW354	8/6/2018	WGMW35420180806	64.25	9.36	54.89	10.4	0.106	**6.37**	0.71	72.7	0.15	110 U	3.3 U	28 U	4.4 U	13000	11 U	11 U	11 U	56 U	1.1 U	5800	11 U	22 U	1100 U	5.6 U	6400	11 U	28 U
MW356	8/1/2018	WGMW35620180801	62.22	8.61	53.61	9.0	0.115	**6.46**	1.42	63.9	1.58	110 U	3.3 U	28 U	4.4 U	13000	11 U	11 U	11 U	**2900**	1.1 U	5800	**370**	22 U	1100	5.6 U	7100	11 U	28 U
Field Blank	7/30/2018	FB20180730	-	-	-	-	-	-	-	-	-	110 U	3.3 U	28 U	4.4 U	1100 U	11 U	11 U	11 U	56 U	1.1 U	1100 U	11 U	22 U	1100 U	5.6 U	1100 U	11 U	28 U
Field Blank	8/2/2018	FB20180802	-	-	-	-	-	-	-	-	-	110 U	3.3 U	28 U	4.4 U	1100 U	11 U	11 U	11 U	56 U	1.1 U	1100 U	11 U	22 U	1100 U	5.6 U	1100 U	11 U	28 U
Screening Level		Department of Ecology Criteria[7]	-	-	-	-	-	6.5-8.5	-	-	-	--	5[10]	1,000	10	--	50	--	1,000	300	50	--	50	--	--	10	--	--	5,000
		Department of Health MCLs[8]	-	-	-	-	0.70	-	-	-	-	--	10	2,000	5	--	100	--	1,300	300	15	--	50	100	--	50	--	--	5,000

Abbreviations:

5	Bolded result exceeds Screening Level (SL)
-	Not measured or not available
°C	Degrees Celsius
feet BGS	Feet below ground surface
feet BTOC	Feet below measuring point (top of casing)
MCL	Maximum Containment Level
mg/L	Milligrams per liter
mS/cm	Millisiemens per centimeter
mV	Milli-Volts
NTU	Nephelometric Turbidity Unit
TOC	Top of casing inside PVC well
U	Analyte not detected above the reporting limit shown
µg/L	Micrograms per liter

Notes:

1. Chemical analyses conducted by OnSite Environmental of Redmond, Washington.
2. The first six digits of the monitoring well identification have been omitted.
3. Groundwater levels are presented as the depth beneath the top of the PVC well casing (TOC) and the depth below ground surface (BGS). Measurements represent static water levels before sampling. Water levels measured during synoptic event are presented on Table 5.
4. Field-measured parameters include temperature (T), conductivity (Cond.), pH, dissolved oxygen (DO), oxidation-reduction potential (EH/ORP) and turbidity.
5. Target Analyte List (TAL) of total metals analyzed by EPA Methods 200.8/6010C . Selected wells were analyzed only for the TAL metals short list which excludes Sb, Be, Se, Ag, and Tl. The Trip Blank samples were not analyzed for TAL total metals.
6. Groundwater sample WGMW00320180802DUP is a field duplicate from well MW003; Groundwater sample WGMW01220180807DUP is a field duplicate from well MW012; Groundwater sample WGMW02420180803DUP is a field duplicate from well MW024.
7. Groundwater Quality Criteria (Criteria) used by the Washington State Department of Ecology are based on Chapter 173-200 Washington Administrative Code (WAC).
8. Maximum Contaminant Levels (MCLs) used by the Washington State Department of Health are based on Chapter 246-290 WAC and EPA's "National Primary Drinking Water Regulations," dated May 2009.
9. Field Blank was collected by pumping lab-prepared DI into sample bottles.
10. Model Toxics Control Act (MTCA) Method A value for Washington.

Table 3: Summer 2018 Chemical Analytical Data[1]

Sample Location ID[2]	Date Sampled	Sample Identification	Total Petroleum Hydrocarbons by NWTPH-HCID (mg/L)			VOCs by EPA 8260C (µg/L)[3]					Contaminants of Emerging Concern (CECs)[3]		Conventionals (mg/L)[5]								Microbiological (CFU/100 mL)[7,8]		
			Gasoline Range	Diesel Range	Lube Oil Range	Acetone	Chloroform	Tetrachloroethene[4]	Trichloroethene[6]	(cis) 1,2-Dichloroethene	Perfluorooctanoic Acid (PFOA) (ng/L)	Perfluorooctane Sulfonate (PFOS) (ng/L)	Chloride	Fluoride	Nitrate (as N)	Sulfate	TDS	Total Organic Carbon (TOC)	Total Alkalinity (mg/L CaCO3)	Total Sulfide	Total Coliforms	Fecal Coliforms	*E. coli*
MW003	8/2/2018	WGMW00320180802	-	-	-	5 U	0.2 U	**1.9**	0.2 U	0.2 U	-	-	9.2	0.034	1.4	13	130	1 U	76	-	-	-	-
MW003	8/2/2018	WGMW00320180802DUP[9]	-	-	-	5 U	0.2 U	**2.0**	0.2 U	0.2 U	-	-	8.9	0.035	1.3	13	120	1 U	72	-	-	-	-
MW004	8/2/2018	WGMW00420180802	-	-	-	5 U	0.29	**0.92**	0.2 U	0.2 U	-	-	16	0.034	1.0	13	140	1 U	80	-	-	-	-
MW010	7/30/2018	WGMW01020180730	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	5.9	0.034	0.99	13	130	1 U	86	-	-	< 2	< 2
MW011	8/7/2018	WGMW01120180807	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	7.7	0.030	0.58	12	120	1 U	78	-	-	-	-
MW012	8/7/2018	WGMW01220180807	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	4.8	0.033	0.85	15	150	1 U	110	0.05 U	-	-	-
MW012	8/7/2018	WGMW01220180807DUP[9]	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	4.8	0.031	0.89	15	140	1 U	110	0.05 U	-	-	-
MW013	8/7/2018	WGMW01320180807	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	5.4	0.039	1.1	13	130	1 U	98	0.05 U	-	-	-
MW014	8/6/2018	WGMW01420180806	0.10 U	0.26 U	0.41 U	5.1	0.2 U	0.2 U	0.2 U	0.2 U	-	-	6.1	0.043	0.061	5 U	110	4.4	120	0.05 U	-	-	-
MW015	8/7/2018	WGMW01520180807	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	6.3	0.063	0.064	5 U	340	13	320	-	-	-	-
MW017	8/2/2018	WGMW00320180802	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	4.5	0.029	0.05 U	6.4	99	2.2	58	-	-	-	-
MW018	8/6/2018	WGMW01820180806	0.10 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	5.5	0.040	0.28	7.8	100	1.6	80	-	-	-	-
MW020	8/6/2018	WGMW02020180806	0.10 U	0.58 [14]	0.42 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	6.1	0.038	0.21	9.2	120	1 U	84	0.05 U	-	-	-
MW023	8/3/2018	WGMW02320180803	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	5.3	0.031	0.92	9.4	140	1 U	82	-	-	-	-
MW024	8/3/2018	WGMW02420180803	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	3.4	0.032	0.93	14	150	1.6	100	-	-	-	-
MW024	8/3/2018	WGMW02420180803DUP[9]	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	3.5	0.037	0.87	14	150	1.5	98	-	-	-	-
MW027	8/1/2018	WGMW02720180801	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	4.8	0.045	0.05 U	6.6	71	2.0	70	0.05 U	-	-	-
MW030	8/1/2018	WGMW03020180801	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	4.9	0.043	0.05 U	5.9	49	2.8	62	0.05 U	-	-	-
MW031	8/3/2018	WGMW03120180803	-	-	-	5 U	0.2 U	0.72	0.2 U	0.2 U	-	-	3.9	0.030	2.6	16	110	1 U	60	0.05 U	-	-	-
MW033	7/30/2018	WGMW03320180730	0.10 U	0.26 U	0.42 U	5 U	0.2 U	0.49	0.2 U	0.2 U	-	-	4.7	0.037	0.05 U	12	99	1.3	64	0.05 U	-	-	-
MW111	8/1/2018	WGMW11120180801	0.10 U	0.26 U	0.41 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	5.5	0.054	0.11	7.6	83	1 U	80	-	< 1	< 1	< 1
MW321	7/30/2018	WGMW32120180730	-	-	-	5 U	0.2 U	0.62	0.47	0.37	4.2	7.1	8.4	0.031	0.058	9.8	110	-	-	-	-	-	-
MW322	7/30/2018	WGMW32220180730	-	-	-	5 U	0.2 U	0.26	0.2 U	0.2 U	8.2	12	8.1	0.028	0.05 U	12	100	-	-	-	-	-	-
MW327	7/30/2018	WGMW32720180730	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	5.5	9.0	6.6	0.024	0.05 U	10	110	-	-	-	-	-	-
MW331	8/2/2018	WGMW33120180802	-	-	-	5 U	0.22	0.2 U	0.2 U	0.2 U	-	-	9.1	0.036	1.2	13	97	1 U	74	-	< 1	< 1	< 1
MW337	8/1/2018	WGMW33720180801	0.11 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	4.1	0.027	2.3	10	73	1 U	50	-	< 1	< 1	< 1
MW343	8/2/2018	WGMW34320180802	-	-	-	5 U	0.2 U	0.66	0.2 U	0.2 U	12	13	9.9	0.042	0.36	16	130	1.8	110	-	< 1	< 1	< 1
MW354	8/6/2018	WGMW35420180806	0.10 U	0.26 U	0.41 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	3.9	0.030	0.05 U	7.4	85	1 U	58	-	-	-	-
MW356	8/1/2018	WGMW35620180801	-	-	-	5 U	0.2 U	0.2 U	0.2 U	0.2 U	-	-	3.1	0.031	0.05 U	5 U	61	3.2	70	0.05 U	-	-	-
Field Blank[10]	7/30/2018	FB20180730	0.11 U	0.26 U	0.42 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	1.9 U	4.7 U	2 U	0.02 U	0.05 U	5 U	13 U	1 U	2 U	-	-	-	-
Field Blank[10]	8/2/2018	FB20180802	0.10 U	0.26 U	0.41 U	5 U	0.2 U	0.2 U	0.2 U	0.2 U	1.9 U	4.8 U	2 U	0.02 U	0.05 U	5 U	13 U	1 U	2 U	0.05 U	-	-	-

Water Quality Exceedances

		pH (std. units)	Arsenic (µg/L)	Iron (µg/L)[1]	Manganese (µg/L)
	Ecology Criterion[3]	6.5-8.5	5	300	50
	DOH Criterion[4]	--	10	300	50
Well[5]	Date				
MW008	2/5/2018	6.49	---	---	67
MW009	2/2/2018	6.3	---	700	---
MW010	1/31/2018	6.38	---	---	74
	7/30/2018	6.24	---	---	---
MW011	1/31/2018	6.48	---	---	---
	8/7/2018	6.45	---	---	---
MW012	2/2/2018	---	190	63,000	1,500
	8/7/2018	---	6.9	2,000	69
MW013	2/2/2018	6.41	---	710	77
	8/7/2018	6.47	---	---	---
MW014	2/6/2018	6.4	12	21,000	2,400
	8/6/2018	6.41	11	12,000	1,300
MW052	1/16/2007	5.55	---	---	---
	7/29/2009	---	7.3	550	600
	2/5/2008	6.4	---	---	---
	7/15/2008	6.1	---	---	---

Notes:

[1] µg/L = micrograms per liter

[2] CFU/100ml = colony forming units per 100 milliliters

[3] Water quality criteria used by the Washington State Department of Ecology are based on Chapter 173-200 of the Washington Administrative code (WAC)

[4] Maximum contaminant levels (MCLs) used by the Washington State Department of Health (DOH) are based on Chapter 246-290 WAC.

[5] Monitoring wells have been given unique reference numbers by City of Redmond. Well locations are shown on Figure 3.

-- = No established regulatory criterion for analyte.

--- = Analyte not tested or test result did not exceed water quality criteria.

MW052 was sampled seven times between 9/1997 and 7/2009 only, and is not included with semi-annual sampling.

Data in table compiled from Golder reports (2018a and 2018b).

Washington State Department of Health

Division of Environmental Health
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Help

Individual System View - REDMOND WATER SYSTEM, CITY OF - Water System Id - 71650B

Compliance Actions | Operating Permits | Operators | Reports | Water Use Efficiency
General Information | Source Information | Samples | Exceedances | Water Quality Monitoring Schedule

Source 13 - 75265/NE Sammamish (1)

Source Status	Active	**Usage**	Emergency	**WRIA**	Undetermined	**Intertie Supplying System**	NE SAMMAMISH SEWER & WATER DISTRICT
Type	Intertie	**Capacity (gpm)**		**Township**	00	**Intertie Supplying Number**	75265
Effective Date	4/10/2007	**Treated**	No	**Range**	00E		
Inactive Date		**Metered**	Yes	**Section**			
DOE Well Tag Number		**Well Depth (ft)**		**Qtr/Qtr Section**			

Source 15 - Well 1R

Source Status	Active	**Usage**	Permanent	**WRIA**	Cedar-Sammamish	**Intertie Supplying System**	NA
Type	Groundwater Well	**Capacity (gpm)**	900	**Township**	25	**Intertie Supplying Number**	NA
Effective Date	4/28/2008	**Treated**	Yes	**Range**	05E		
Inactive Date		**Metered**	Yes	**Section**	12		
DOE Well Tag Number		**Well Depth (ft)**	83	**Qtr/Qtr Section**	NENW		

Source 14 - Well 1R & 2R

Source Status	Active	**Usage**	Permanent	**WRIA**	Cedar-Sammamish	**Intertie Supplying System**	NA
Type	Groundwater Well	**Capacity (gpm)**	1,400	**Township**	25	**Intertie Supplying Number**	NA
Effective Date	4/28/2008	**Treated**	Yes	**Range**	05E		
Inactive Date		**Metered**	Yes	**Section**	12		
DOE Well Tag Number		**Well Depth (ft)**	86	**Qtr/Qtr Section**	NENW		

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Wells 1R & 2R Combined

Help

Water Quality Detail View

WSID	WS Name	County	Grp	Type	Status	Src #	DOE Src	Collect Date	Test Panel	Analyte Group	Sample Purpose	Sam #	Lab #	Exceedances
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/6/2009	VOC1	VOC	RC	21069	046	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/6/2009	IOC	IOC	RC	21073	046	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/6/2009	IOC	IOC	RC	21074	046	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		8/4/2009	RAD	RAD	RC	24725	130	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/19/2010	NIT	IOC	RC	11651	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		8/31/2010	HERB1	SOC	RC	46796	125	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		8/31/2010	PEST1	SOC	RC	46796	125	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/28/2011	RAD	RAD	RC	24001	142	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/29/2011	NIT	IOC	RC	10313	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/13/2012	NIT	IOC	RC	10231	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/16/2012	IOC	IOC	RC	27085	046	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/11/2013	NIT	IOC	RC	09218	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/11/2013	HERB1	SOC	RC	85612	125	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/17/2013	VOC1	VOC	RC	09478	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/9/2014	NIT	IOC	RC	10298	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		5/4/2015	NIT	IOC	RC	06243	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		5/4/2015	RAD	RAD	RC	06243	197	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		4/13/2016	RAD	RAD	RC	56001	233	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		5/18/2016	NIT	IOC	RC	09165	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		7/11/2016	VOC1	VOC	RC	17221	125	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		5/3/2017	IOC	IOC	RC	06419	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		5/2/2018	NIT	IOC	RC	07529	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		3/6/2019	NIT	IOC	RC	02742	066	No
71650B	REDMOND WATER SYSTEM CITY OF	KING	A	Comm	Act	14		3/6/2019	AR	IOC	RC	02742	066	No

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/6/2009
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	21069
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	treated tap blended
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0027	CHLOROFORM	LT	0.5000		ug/L	0.5000
0028	BROMODICHLOROMETHANE	LT	0.5000		ug/L	0.5000
0029	DIBROMOCHLOROMETHANE	LT	0.5000		ug/L	0.5000
0030	BROMOFORM	LT	0.5000		ug/L	0.5000
0045	VINYL CHLORIDE	LT	0.5000	2.0000	ug/L	0.5000
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	ug/L	0.5000
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	ug/L	0.5000
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	ug/L	0.5000
0049	BENZENE	LT	0.5000	5.0000	ug/L	0.5000
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	ug/L	0.5000
0053	CHLOROMETHANE	LT	0.5000		ug/L	0.5000
0054	BROMOMETHANE	LT	0.5000		ug/L	0.5000
0055	CHLOROETHANE	LT	0.5000		ug/L	0.5000
0056	METHYLENE CHLORIDE(DICHLOROMETHANE)	LT	0.5000	5.0000	ug/L	0.5000
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	ug/L	0.5000
0058	1,1 DICHLOROETHANE	LT	0.5000		ug/L	0.5000
0059	2,2 DICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	ug/L	0.5000
0062	1,1 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	ug/L	0.5000
0064	DIBROMOMETHANE	LT	0.5000		ug/L	0.5000
0065	CIS- 1,3 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0066	TOLUENE	LT	0.5000	1000.0000	ug/L	0.5000

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/6/2009
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	21069
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	treated tap blended
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0067	1,1,2 TRICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0068	TETRACHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0069	TRANS- 1,3 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0070	1,3 DICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0071	CHLOROBENZENE	LT	0.5000	100.0000	ug/L	0.5000
0072	1,1,1,2 TETRACHLOROETHANE	LT	0.5000		ug/L	0.5000
0073	ETHYLBENZENE	LT	0.5000	700.0000	ug/L	0.5000
0074	M/P XYLENES (MCL FOR TOTAL)	LT	0.5000		ug/L	0.5000
0075	O- XYLENE (MCL FOR TOTAL)	LT	0.5000		ug/L	0.5000
0076	STYRENE	LT	0.5000	100.0000	ug/L	0.5000
0078	BROMOBENZENE	LT	0.5000		ug/L	0.5000
0079	1,2,3 TRICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0080	1,1,2,2 TETRACHLOROETHANE	LT	0.5000		ug/L	0.5000
0081	O- CHLOROTOLUENE	LT	0.5000		ug/L	0.5000
0082	P- CHLOROTOLUENE	LT	0.5000		ug/L	0.5000
0083	M- DICHLOROBENZENE	LT	0.5000		ug/L	0.5000
0084	1,2 DICHLOROBENZENE	LT	0.5000	600.0000	ug/L	0.5000
0085	TRICHLOROFLUOROMETHANE	LT	0.5000		ug/L	0.5000
0086	BROMOCHLOROMETHANE	LT	0.5000		ug/L	0.5000
0087	ISOPROPYLBENZENE	LT	0.5000		ug/L	0.5000
0088	N-PROPYLBENZENE	LT	0.5000		ug/L	0.5000
0089	1,3,5 TRIMETHYLBENZENE	LT	0.5000		ug/L	0.5000
0090	TERT- BUTYLBENZENE	LT	0.5000		ug/L	0.5000
0091	1,2,4 TRIMETHYLBENZENE	LT	0.5000		ug/L	0.5000
0092	SEC- BUTYLBENZENE	LT	0.5000		ug/L	0.5000

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Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/6/2009
Lab Number	046
Lab Name	Edge Analytical - Burlington
Sample Number	21069
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	treated tap blended
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0102	EDB (ETHYLENE DIBROMIDE)	LT	0.5000	0.0500	ug/L	0.5000
0103	DBCP	LT	0.5000	0.2000	ug/L	0.5000
0093	P-ISOPROPYLTOLUENE	LT	0.5000		ug/L	0.5000
0094	N-BUTYLBENZENE	LT	0.5000		ug/L	0.5000
0095	1,2,4 TRICHLOROBENZENE	LT	0.5000	70.0000	ug/L	0.5000
0096	NAPHTHALENE	LT	0.5000		ug/L	0.5000
0097	HEXACHLOROBUTADIENE	LT	0.5000		ug/L	0.5000
0098	1,2,3 TRICHLOROBENZENE	LT	0.5000		ug/L	0.5000
0104	DICHLORODIFLUOROMETHANE	LT	0.5000		ug/L	0.5000
0160	TOTAL XYLENES	LT	0.5000	10000.0000	ug/L	0.5000
0031	TOTAL TRIHALOMETHANE	ND		80.0000	ug/L	

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Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/17/2013
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	09478
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	well 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0027	CHLOROFORM	LT	0.5000		ug/L	0.5000
0045	VINYL CHLORIDE	LT	0.5000	2.0000	ug/L	0.5000
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	ug/L	0.5000
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	ug/L	0.5000
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	ug/L	0.5000
0049	BENZENE	LT	0.5000	5.0000	ug/L	0.5000
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	ug/L	0.5000
0053	CHLOROMETHANE	LT	0.5000		ug/L	0.5000
0054	BROMOMETHANE	LT	0.5000		ug/L	0.5000
0056	METHYLENE CHLORIDE(DICHLOROMETHANE)	LT	0.5000	5.0000	ug/L	0.5000
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	ug/L	0.5000
0058	1,1 DICHLOROETHANE	LT	0.5000		ug/L	0.5000
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	ug/L	0.5000
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	ug/L	0.5000
0066	TOLUENE	LT	0.5000	1000.0000	ug/L	0.5000
0067	1,1,2 TRICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0068	TETRACHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0071	CHLOROBENZENE	LT	0.5000	100.0000	ug/L	0.5000
0073	ETHYLBENZENE	LT	0.5000	700.0000	ug/L	0.5000
0074	M/P XYLENES (MCL FOR TOTAL)	LT	0.5000		ug/L	0.5000
0075	O- XYLENE (MCL FOR TOTAL)	LT	0.5000		ug/L	0.5000
0076	STYRENE	LT	0.5000	100.0000	ug/L	0.5000
0078	BROMOBENZENE	LT	0.5000		ug/L	0.5000

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Washington State Department of Health

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Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/17/2013
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	09478
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	well 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0102	EDB (ETHYLENE DIBROMIDE)	LT	0.5000	0.0500	ug/L	0.5000
0103	DBCP	LT	0.5000	0.2000	ug/L	0.5000
0079	1,2,3 TRICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0081	O- CHLOROTOLUENE	LT	0.5000		ug/L	0.5000
0084	1,2 DICHLOROBENZENE	LT	0.5000	600.0000	ug/L	0.5000
0085	TRICHLOROFLUOROMETHANE	LT	0.5000		ug/L	0.5000
0086	BROMOCHLOROMETHANE	LT	0.5000		ug/L	0.5000
0089	1,3,5 TRIMETHYLBENZENE	LT	0.5000		ug/L	0.5000
0091	1,2,4 TRIMETHYLBENZENE	LT	0.5000		ug/L	0.5000
0092	SEC- BUTYLBENZENE	LT	0.5000		ug/L	0.5000
0095	1,2,4 TRICHLOROBENZENE	LT	0.5000	70.0000	ug/L	0.5000
0096	NAPHTHALENE	LT	0.5000		ug/L	0.5000
0104	DICHLORODIFLUOROMETHANE	LT	0.5000		ug/L	0.5000
0160	TOTAL XYLENES	LT	0.5000	10000.0000	ug/L	0.5000

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Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/11/2016
Lab Number	125
Lab Name	Anatek Labs, Inc Moscow
Sample Number	17221
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0027	CHLOROFORM	LT	0.5000		ug/L	0.5000
0028	BROMODICHLOROMETHANE	LT	0.5000		ug/L	0.5000
0029	DIBROMOCHLOROMETHANE	LT	0.5000		ug/L	0.5000
0030	BROMOFORM	LT	0.5000		ug/L	0.5000
0045	VINYL CHLORIDE	LT	0.5000	2.0000	ug/L	0.5000
0046	1,1 DICHLOROETHYLENE	LT	0.5000	7.0000	ug/L	0.5000
0047	1,1,1 TRICHLOROETHANE	LT	0.5000	200.0000	ug/L	0.5000
0048	CARBON TETRACHLORIDE	LT	0.5000	5.0000	ug/L	0.5000
0049	BENZENE	LT	0.5000	5.0000	ug/L	0.5000
0050	1,2 DICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0051	TRICHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0052	1,4 DICHLOROBENZENE	LT	0.5000	75.0000	ug/L	0.5000
0053	CHLOROMETHANE	LT	0.5000		ug/L	0.5000
0054	BROMOMETHANE	LT	0.5000		ug/L	0.5000
0055	CHLOROETHANE	LT	0.5000		ug/L	0.5000
0056	METHYLENE CHLORIDE(DICHLOROMETHANE)	LT	0.5000	5.0000	ug/L	0.5000
0057	TRANS- 1,2 DICHLOROETHYLENE	LT	0.5000	100.0000	ug/L	0.5000
0058	1,1 DICHLOROETHANE	LT	0.5000		ug/L	0.5000
0059	2,2 DICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0060	CIS- 1,2 DICHLOROETHYLENE	LT	0.5000	70.0000	ug/L	0.5000
0062	1,1 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0063	1,2 DICHLOROPROPANE	LT	0.5000	5.0000	ug/L	0.5000
0064	DIBROMOMETHANE	LT	0.5000		ug/L	0.5000
0065	CIS- 1,3 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0066	TOLUENE	LT	0.5000	1000.0000	ug/L	0.5000

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Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	7/11/2016
Lab Number	125
Lab Name	Anatek Labs, Inc Moscow
Sample Number	17221
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0067	1,1,2 TRICHLOROETHANE	LT	0.5000	5.0000	ug/L	0.5000
0068	TETRACHLOROETHYLENE	LT	0.5000	5.0000	ug/L	0.5000
0069	TRANS- 1,3 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0070	1,3 DICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0071	CHLOROBENZENE	LT	0.5000	100.0000	ug/L	0.5000
0072	1,1,1,2 TETRACHLOROETHANE	LT	0.5000		ug/L	0.5000
0073	ETHYLBENZENE	LT	0.5000	700.0000	ug/L	0.5000
0074	M/P XYLENES (MCL FOR TOTAL)	LT	0.5000		ug/L	0.5000
0075	O- XYLENE (MCL FOR TOTAL)	LT	0.5000		ug/L	0.5000
0076	STYRENE	LT	0.5000	100.0000	ug/L	0.5000
0078	BROMOBENZENE	LT	0.5000		ug/L	0.5000
0079	1,2,3 TRICHLOROPROPANE	LT	0.5000		ug/L	0.5000
0080	1,1,2,2 TETRACHLOROETHANE	LT	0.5000		ug/L	0.5000
0081	O- CHLOROTOLUENE	LT	0.5000		ug/L	0.5000
0082	P- CHLOROTOLUENE	LT	0.5000		ug/L	0.5000
0083	M- DICHLOROBENZENE	LT	0.5000		ug/L	0.5000
0084	1,2 DICHLOROBENZENE	LT	0.5000	600.0000	ug/L	0.5000
0085	TRICHLOROFLUOROMETHANE	LT	0.5000		ug/L	0.5000
0086	BROMOCHLOROMETHANE	LT	0.5000		ug/L	0.5000
0087	ISOPROPYLBENZENE	LT	0.5000		ug/L	0.5000
0088	N-PROPYLBENZENE	LT	0.5000		ug/L	0.5000
0089	1,3,5 TRIMETHYLBENZENE	LT	0.5000		ug/L	0.5000
0090	TERT- BUTYLBENZENE	LT	0.5000		ug/L	0.5000
0091	1,2,4 TRIMETHYLBENZENE	LT	0.5000		ug/L	0.5000
0092	SEC- BUTYLBENZENE	LT	0.5000		ug/L	0.5000

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Help

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Collect Date	7/11/2016
Lab Number	125
Lab Name	Anatek Labs, Inc Moscow
Sample Number	17221
Source	14 Wells 1R & 2R Combined
Analyte Group	VOC-VOLATILE ORGANIC CONTAMINANTS
Test Panel	VOC1-VOLATILE ORGANIC
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0093	P-ISOPROPYLTOLUENE	LT	0.5000		ug/L	0.5000
0094	N-BUTYLBENZENE	LT	0.5000		ug/L	0.5000
0095	1,2,4 TRICHLOROBENZENE	LT	0.5000	70.0000	ug/L	0.5000
0096	NAPHTHALENE	LT	0.5000		ug/L	0.5000
0097	HEXACHLOROBUTADIENE	LT	0.5000		ug/L	0.5000
0098	1,2,3 TRICHLOROBENZENE	LT	0.5000		ug/L	0.5000
0104	DICHLORODIFLUOROMETHANE	LT	0.5000		ug/L	0.5000
0154	1,3 DICHLOROPROPENE	LT	0.5000		ug/L	0.5000
0160	TOTAL XYLENES	LT	0.5000	10000.0000	ug/L	0.5000
0427	EDB (screening)	LT	0.5000		ug/L	0.5000
0428	DBCP (screening)	LT	0.5000		mg/L	0.5000

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Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	5/3/2017
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	06419
Source	14 Wells 1R & 2R Combined
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	IOC-COMPLETE INORGANIC ANALYSIS
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0014	SODIUM	EQ	9.6000		mg/L	5.0000
0015	HARDNESS	EQ	83.0000		mg/L	10.0000
0016	CONDUCTIVITY	EQ	240.0000	700.0000	Umhos/cm	70.0000
0017	TURBIDITY	EQ	0.3400		NTU	0.1000
0019	FLUORIDE	EQ	0.8100	4.0000	mg/L	0.2000
0020	NITRATE-N	EQ	0.5800	10.0000	mg/L	0.2000
0026	TDS-TOTAL DISSOLVED SOLIDS	EQ	130.0000	500.0000	mg/L	100.0000
0161	TOTAL NITRATE/NITRITE	EQ	0.5800		mg/L	0.5000
0004	ARSENIC	LT	0.0010	0.0104	mg/L	0.0010
0005	BARIUM	LT	0.4000	2.0000	mg/L	0.4000
0006	CADMIUM	LT	0.0020	0.0050	mg/L	0.0020
0007	CHROMIUM	LT	0.0200	0.1000	mg/L	0.0200
0008	IRON	LT	0.1000	0.3000	mg/L	0.1000
0009	LEAD	LT	0.0010		mg/L	0.0010
0010	MANGANESE	LT	0.0100	0.0500	mg/L	0.0100
0011	MERCURY	LT	0.0004	0.0020	mg/L	0.0004
0012	SELENIUM	LT	0.0100	0.0500	mg/L	0.0100
0013	SILVER	LT	0.1000	0.1000	mg/L	0.1000
0018	COLOR	LT	15.0000	15.0000	CU	15.0000
0021	CHLORIDE	LT	20.0000	250.0000	mg/L	20.0000
0022	SULFATE	LT	50.0000	250.0000	mg/L	50.0000
0023	COPPER	LT	0.0200		mg/L	0.0200
0024	ZINC	LT	0.2000	5.0000	mg/L	0.2000
0110	BERYLLIUM	LT	0.0008	0.0040	mg/L	0.0008
0111	NICKEL	LT	0.1000	0.1000	mg/L	0.1000

Records 1 - 25 of 29

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Department of Health, Office of Drinking Water

Street Address:
243 Israel Road S.E. 2nd floor
Tumwater, WA 98501

Mail:
PO BOX 47822
Olympia, WA 98504-7822

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Comments or questions regarding this Web site? Send email to Environmental Health Application Testing and Support or call 888-457-2467.
For technical issues with this website send email to DOH IT Service Desk or call 360-236-4357.

Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM, CITY OF

Collect Date	5/3/2017
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	06419
Source	14 Wells 1R & 2R Combined
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	IOC-COMPLETE INORGANIC ANALYSIS
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0112	ANTIMONY	LT	0.0060	0.0060	mg/L	0.0060
0113	THALLIUM	LT	0.0020	0.0020	mg/L	0.0020
0114	NITRITE-N	LT	0.2000	1.0000	mg/L	0.2000
0116	CYANIDE	LT	0.0100	0.2000	mg/L	0.0100

Records 26 - 29 of 29

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM CITY OF

Collect Date	5/2/2018
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	07529
Source	14 Wells 1R & 2R Combined
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	NIT-NITRATE SUITE
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0020	NITRATE-N	LT	0.2000	10.0000	mg/L	0.5000
0114	NITRITE-N	LT	0.2000	1.0000	mg/L	0.1000
0161	TOTAL NITRATE/NITRITE	LT	0.5000		mg/L	0.5000

Records 1 - 3 of 3

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM CITY OF

Collect Date	3/6/2019
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	02742
Source	14 Wells 1R & 2R Combined
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	NIT-NITRATE SUITE
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0020	NITRATE-N	EQ	0.6100	10.0000	mg/L	0.5000
0161	TOTAL NITRATE/NITRITE	EQ	0.6100		mg/L	0.5000
0114	NITRITE-N	LT	0.1000	1.0000	mg/L	0.1000

Records 1 - 3 of 3

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Washington State Department of Health

Division of Environmental Health
Office of Drinking Water

Help

View Sample Detail - WSID 71650B - REDMOND WATER SYSTEM CITY OF

Collect Date	3/6/2019
Lab Number	066
Lab Name	Amtest, Inc - Redmond
Sample Number	02742
Source	14 Wells 1R & 2R Combined
Analyte Group	IOC-INORGANIC CONTAMINANTS
Test Panel	AR-ARSENIC
Sample Location	wells 1&2 treated tap
Sample Type	Post-Treatment / Finished

Analyte DOH Num	Analyte Name	Result Range	Result Quantity	Maximum Contaminant Level	Units	State Reporting Limit
0004	ARSENIC	LT	0.0010	0.0104	mg/L	0.0010

Records 1 - 1 of 1

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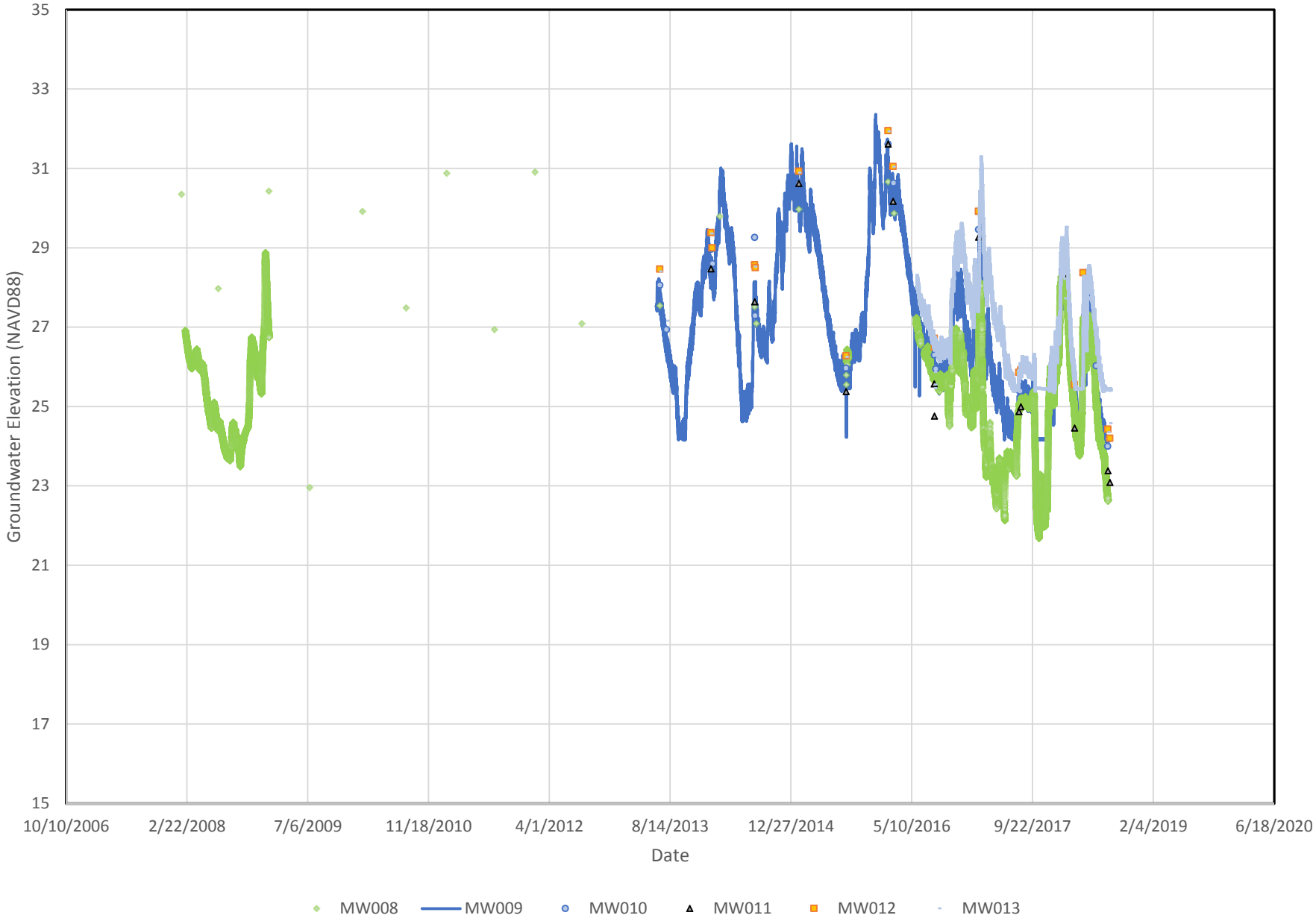
APPENDIX C

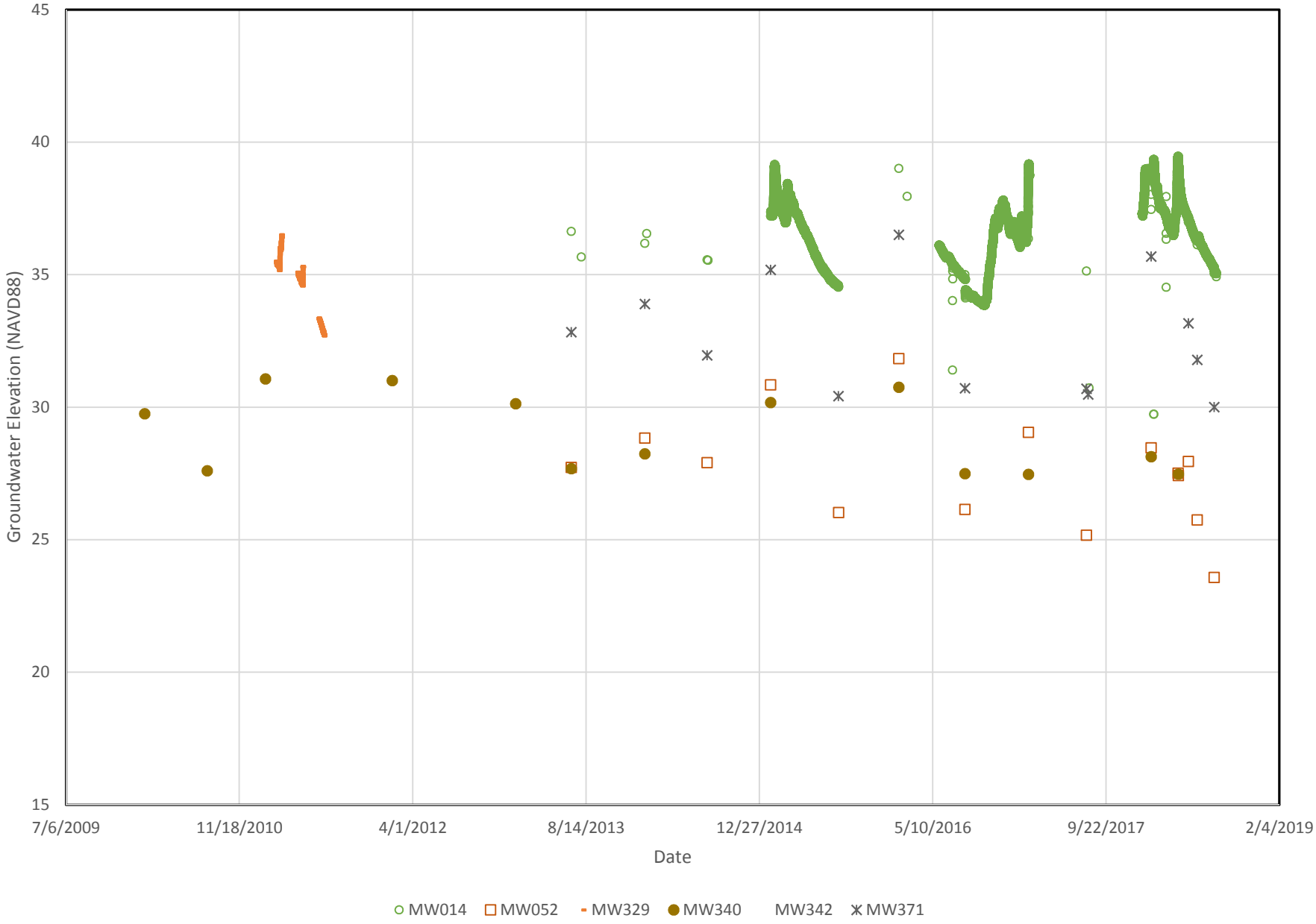
Water Level Data for City of Redmond Monitoring Wells



Groundwater Hydrograph
MW008, MW009, MW010, MW011, MW012, MW013
City of Redmond Monitoring Wells

Associated Earth Sciences, Inc.

Figure C1
Project No. 180106E001
Date: 04/2019



Groundwater Hydrograph
MW014, MW052, MW329, MW342, MW371
City of Redmond Monitoring Wells

Figure C2
Project No. 180106E001
Date: 04/2019

Associated Earth Sciences, Inc.

Table C1
Minimum and Maximum Groundwater Elevations

Well	GS Elev. (ft)	Minimum GW Elev. (ft)	Maximum GW Elev. (ft)
MW008	48.40		
MW009	48.52	24.02	32.36
MW010	50.50	24.00	31.61
MW011	49.39	23.09	31.61
MW012	50.56	24.20	31.95
MW013	50.70	24.35	31.93
MW014	49.25	29.74	39.47
MW052	51.16	23.58	31.83
MW340	47.46	27.47	31.07
MW342	44.95	23.03	33.88
MW371	43.53	30.01	36.51

Period of record: June 2013 through August 2018

Minimum/Maximum elevations in MW009, MW013, MW014 and MW342 based on continuous or semi-continuous data collection.

Minimum/Maximum elevations in MW010, MW011, MW012, MW052, MW340 and MW371 based on periodic water level measurements.

GS Elev. = Ground surface elevation

GW = Groundwater

ft = feet.

Vertical datum per City of Redmond: NAVD88
Water level/elevation data provided by City of Redmond

Table C2
Winter 2019 Groundwater Elevations

Well ID	Date	DTW (ft bTOC)	GW Elevation
MW008	1/30/2019	20.38	27.61
MW009	1/30/2019	20.51	27.60
MW010	1/30/2019	21.67	28.15
MW011	1/30/2019	21.43	27.76
MW012	1/30/2019	21.57	28.65
MW013	1/30/2019	22.81	27.59
MW014	1/30/2019	11.91	36.68
MW052	1/30/2019	22.47	28.04
MW340	1/30/2019	19.88	27.5
MW342	1/30/2019	15.45	29.23
MW371	1/30/2019	9.77	33.51

DTW (ft bTOC) = depth to water, feet below top of casing
Water level/elevaton data provided by City of Redmond
GW = groundwater

APPENDIX D

Off-Site Properties Environmental Data

Cleanup Site Details

KING COUNTY

SITE ID:	**Overlake Cleaners**	Cleanup Site ID: 954	FS ID: 6427
	Alternate Name(s): Overlake Cleaners		

LOCATION:		WRIA: 8	Lat/Long:	47.673	-122.114	**View Vicinity Map**
Address:	16940 NE 79TH ST		Township	Range	Section	Legislative District: 48
	REDMOND 98052		25N	5E	12	Congressional District: 1

STATUS:	**Cleanup Started**	Rank: 1	**View Site Web Page**	**View Site Documents**
	Responsible Unit: Northwest	Site Manager: Northwest Region	Statute: MTCA	
	Is Brownfield?	Has Environmental Covenant?	Is PSI Site?	
	NFA Received?	NFA Date:	NFA Reason:	

ASSOCIATED CLEANUP UNIT(s)

cuID	Cleanup Unit Name	Unit Type	Process Type	Unit Status	Size (Acres)	ERTS ID
1614	Overlake Cleaners	Upland	Independent Action	Cleanup Started		425226

SITE ACTIVITIES:

Applies to:	Related ID (Unit-LUST-VCP)	Activity Display Name	Status	Start Date	End Date	Legal Mechanism	Performed By	Project Manager
CleanupSite		Initial Investigation / Federal Preliminary Assessment	Completed	9/27/1996	9/27/1996		Ecology	O'Brien, Maura
CleanupSite		Early Notice Letter(s)	Completed	10/25/1996	10/25/1996			O'Brien, Maura
CleanupSite		Site Hazard Assessment/Federal Site Inspection	Completed	12/11/1996	1/16/1997		Ecology	O'Brien, Maura
CleanupSite		Hazardous Sites Listing/NPL	Completed	2/18/1997	2/18/1997			O'Brien, Maura
Upland		Independent Report Review - Paid	Canceled	6/1/1998	11/4/1999		Ecology	O'Brien, Maura

AFFECTED MEDIA & CONTAMINANTS:

Media:

Contaminant:	Ground Water	Surface Water	Soil	Sediment	Air	Bedrock
Halogenated Organics	C		C			
Metals Priority Pollutants			S			

Key:
B - Below Cleanup Level
C - Confirmed Above Cleanup Level
S - Suspected

R - Remediated
RA - Remediated-Above
RB - Remediated-Below

CleanupSiteDetails2014

SOIL & GROUNDWATER SAMPLING & TESTING

Overlake Cleaners
16940 Northeast 79th Street
Redmond, Washington 98052

J-YOUNG, LLC

ENVIRONMENTAL
ASSOCIATES, INC.

1380 - 112th Avenue Northeast, Suite 300
Bellevue, Washington 98004
(425) 455-9025 Office
(888) 453-5394 Toll Free
(425) 455-2316 Fax

July 12, 2007 JN-27200

Mr. David Lee
J-Young, LLC
16940 Northeast 79th Street
Redmond, Washington 98052

Subject: **SOIL & GROUNDWATER SAMPLING & TESTING**
Overlake Cleaners
16940 Northeast 79th Street
Redmond, Washington 98052

Dear Mr. Lee:

Environmental Associates, Inc. (EAI) has conducted limited sampling and laboratory testing of soil and groundwater at the above-referenced property located in Redmond, Washington. This letter report, prepared in accordance with the terms of our proposal dated June 13, 2007 and Change Order dated July 2, 2007, summarizes our approach to the project along with results and conclusions.

Project Background

During a site meeting with the client on June 11, 2007, EAI was advised that previous environmental work conducted by others in 1997 confirmed that a release of chlorinated dry cleaning solvent (tetrachloroethene, also known as perchloroethylene, PCE, or PERC) to shallow subsurface soils had occurred proximal to the former on-site dry cleaner machine. The client opined that the cause of the PERC release was from a small spill of PERC behind the dry cleaner machine which was present on the property approximately 10 years ago. The client advised that dry cleaning activities at the property began in approximately 1989 and ceased in February 2007. The property is now a "drop-off" point for dry cleaning which is performed at an off-site facility.

"Overlake Cleaners" (listed at 16940 NE 79th Street in Redmond, WA) appears on the WDOE's current listing of "Confirmed and Suspected Contaminated Sites" (CSCS) with a listed hazard ranking number of "1" (i.e. high priority).

Two (2) groundwater monitoring wells were installed on the property and one (1) off-site monitoring well was installed nearby to the north in an alley by others in 1997 in an effort to evaluate for the presence of PCE in groundwater. A City of Redmond municipal drinking water supply well is located in nearby Anderson Park, approximately 200 feet to the west of the site, beyond NE 79th Street. Copies of reports regarding the findings of the previous environmental studies conducted by others (ENSR, GeoEngineers, etc.) pertaining to the property were not made available to EAI from the client until the commencement of this current scope of work.

Review of documentation provided to us by the client (see copies of select documents Appendix C) revealed the following potentially significant findings:

- A September 27, 1996-dated "Department of Ecology Environmental Report Tracking System Incident History" summary advises that Mr. Tom Fix of the City of Redmond Water Department reported that "Redmond Municipal Wells 1 and 2 in Anderson Park have been picking up tetrachloroethylene (PCE) a dry cleaning solvent in municipal well pumpage since August 1996. Levels are currently around 3.5 ppb [parts-per-billion]. There is a suspected source dry cleaners (Overlake) directly across 79th Street from the well houses in the park". Reported concentrations of PCE in water pumped from the City of Redmond wells in Anderson Park at that time (August-to-September 1996) did not exceed the "maximum contaminant level" (MCL) of 5 ppb.

- An "Initial Investigation at and around Anderson Park including Overlake Cleaners" was performed by the Washington Department of Ecology (WDOE) in October 1996 in an effort to identify possible sources of PCE contamination detected in groundwater pumped from the City of Redmond's municipal water wells in Anderson Park. Laboratory testing of near-surface soil samples (collected from less than 12 inches deep) from locations generally described as "below fan location", "below building, dry cleaning machine, and slab", and "below water cooling discharge pipe" revealed PCE concentrations ranging from 50 parts-per-billion (ppb) to 977 ppb), which is <u>at or above the current</u> Model Toxics Control Act (MTCA) Method A cleanup level for PCE in soil. For reference, the Model Toxics Control Act (MTCA) Method A cleanup level for PCE in soil in 1996 was 500 ppb, and the <u>current</u> MTCA Method A cleanup level for PCE in soil is 50 ppb. Low concentrations of trichloroethylene (TCE) and methylene chloride <u>below the current</u> Model Toxics Control Act (MTCA) Method A cleanup level for TCE (30 ppb) and for methylene chloride (20 ppb) were reported in those near-surface soil samples collected by the WDOE at Overlake Cleaners in October 1996. Trace concentrations of 1,2 - dichloroethane ranging from 1.5 ppb to 9.5 ppb were also reported in those near-surface soil samples collected at Overlake Cleaners by the WDOE in October 1996. A laboratory tested sample of "fan lint"collected by the WDOE at Overlake Cleaners during their October 1996 study reportedly revealed an elevated PCE concentration of 1,220 ppb. Exact locations of those collected soil samples or "fan lint" at Overlake Cleaners were not clearly shown or described in the 1996-dated WDOE "Initial Investigation" report. Laboratory testing of water samples collected by the WDOE "...from dry cleaning water cooling discharge pipe" at Overlake Cleaners reportedly revealed trace concentrations of PCE at 2.9 ppb and 1.2 ppb, respectively.

- In August 1997, ENSR conducted additional near-surface soil sampling and laboratory testing at the Overlake Cleaners site. Ten (10) soil samples were collected from depths of less than 12 inches using hand tools from locations proximal to the back door of the dry cleaner, adjacent to the northeast side of the dry cleaning machine, and below the exterior side of the east-most wall fan on the northeast side of the building. Only three (3) of the samples were submitted for laboratory testing (samples collected from near the back door of the dry cleaner) which returned results of detectable PCE at concentrations ranging from 0.37 parts-per-million (ppm) to 5.6 ppm, which is above the current MTCA Method A cleanup level of 0.05 ppm for PCE in soil. The lateral and vertical extent of PCE-impacted soils was not characterized in the scope of ENSR's work at the site in 1997.

- On September 24, 1997 Stoel Rives, LLP (attorneys) presented a letter, which includes enclosures prepared by ENSR (in the form of boring logs, chain of custody record, a draft table of laboratory results, and two (2) figures depicting the locations of three (3) groundwater monitoring wells), addressed to the WDOE regarding the installation and sampling of two (2) existing on-site groundwater monitoring wells (MW-1 and MW-2) by ENSR at the Overlake Cleaners site in August-to-September 1997. The letter was signed by Mr. Richard A. Du Bey. Stoel Rives, LLP's (SRL's) September 24, 1997-dated letter advises that "...Overlake Cleaners was pleased to observe that the sample results from MW-2, the well closest to Anderson Park wells, tested clean and no PCE, methylene chloride or chloromethane was detected. Moreover, the groundwater gradient, as evidenced by the elevations taken from three wells, appears to be north/northwest" (SRL, 1997). Review of the enclosures with SRL's 1997-dated letter suggests that PCE was detected in the on-site monitoring well MW-1 (located northeast of the dry cleaning machine) at a concentration of 10.6 ppb (above the MTCA Method A cleanup level of 5 ppb for PCE in groundwater) in September 1997. PCE was also reportedly detected in the City of Redmond's groundwater monitoring well "MW-3" located in the asphalt-paved alley nearby to the north of the site at a concentration of 2.84 ppb. Trace concentrations of gasoline constituents benzene, toluene and xylenes (below their applicable MTCA Method A cleanup levels) were reported in groundwater sampled from the City of Redmond's monitoring well "MW-3" in September 1997. In a separate letter prepared by SRL addressed to the WDOE and dated November 3, 1997 titled "Re: October 15, 1997 Meeting Among Overlake Cleaners, The City of Redmond and Department of Ecology", SRL stated that "Based on the facts disclosed during the August 14, 1997 soil sampling event, the September 10, 1997 groundwater sampling event, and ENSR's analysis of those facts, ENSR has concluded that the source of the PCE impacting the Overlake Cleaners Redmond facility is an unknown upgradient source east of MW-1" (SLR, 1997).

- The client provided EAI with a copy of laboratory testing results for chlorinated solvents from a groundwater sample collected from the nearby off-site City of Redmond monitoring well "MW-3" by Geo Engineers on August 5, 2005. Review of the laboratory report suggests that no detectable concentrations of PCE or its degradation by-products of TCE, 1,2 dichloroethane, or vinyl chloride were reported in the laboratory tested groundwater sample collected by GeoEngineers during the August 5, 2005 sampling event.

Mr. Kevin Murphy of the City of Redmond Wellhead Protection Program advised EAI in the course of a telephone interview on June 29, 2007 that the City of Redmond's monitoring well located in the alley nearby to the north of Overlake Cleaners ("MW-3") was sampled within the last 6 months (approximately January 2007) and that trace PCE, below the MTCA Method A cleanup level of 5 ppb, was reported by laboratory testing of that groundwater sample. Documentation of that most recent sampling event of well MW-3 was not available to EAI at the time of this writing.

No documentation of soil and/or groundwater sampling and testing at the Overlake Cleaners property since September 1997 (if any) was provided to EAI by the client, nor was such found in our (EAI) review of information pertaining to Overlake Cleaners reviewed on-file at the Northwest Regional Office of the WDOE on July 12, 2007.

Methodology / Scope of Work

The client's desire to conduct a preliminary subsurface exploration proximal to/within the former on-site dry cleaner in an effort to make a tentative evaluation of the approximate lateral and vertical extent of the shallow PCE-impacted soil discovered by others in 1996-1997, along with sampling and testing of the two (2) on-site groundwater monitoring wells, formed the basis for the following current scope of work:

- Complete nine (9) soil borings in the vicinity of the former dry-cleaning machine inside Overlake Cleaners, and in the area proximal to the exterior northeast side of the building where shallow PCE-impacted soils were reportedly discovered by others in 1996-1997. One of the exterior borings was advanced to approximately 24 feet deep to collected a groundwater "grab sample" from proximal to the former dry cleaner machine.

- Collect groundwater samples from the two (2) pre-existing on-site monitoring wells (MW-1 and MW-2). Sampling of the existing City of Redmond monitoring well located in the alley nearby to the north of the site (MW-3) was not conducted as appropriate permits could not be obtained within the client-specified time frame for completion of the field work associated with this project (less than 2 weeks). Measurement of groundwater flow direction/gradient was not envisioned as part of this current scope of work.

- Collect and analyze select soil and groundwater samples from the borings and groundwater samples obtained from the two (2) on-site monitoring wells for chlorinated volatile organic compounds, which includes the dry-cleaning solvent tetrachloroethene (PCE) or "perc" and its common degradation products.

- Prepare a summary letter report documenting the methodology employed along with findings and conclusions.

Site Location

The subject property (Overlake Cleaners) is located at 16940 Northeast 79th Street (King County tax parcel # 77920900165) and covers approximately 9,106 square feet (0.21 acres) of land, in a mixed residential and commercial area of downtown Redmond, Washington. Existing improvements include a 1942-vintage single-story wood frame structure (former single-family residence converted to a dry cleaner during the 1980's) enclosing approximately 1,020 square feet of space. Additional improvements include a 1942-vintage wood frame structure (former detached garage converted to an office) enclosing approximately 300 square feet of space, and an asphalt-paved driveway and concrete walkways. The client advised EAI that dry cleaning activities at the property ceased in February 2007. The Overlake Cleaners building is presently used as a "drop off" point for dry cleaning which is now conducted at an off-site facility. The approximate location of the subject site is depicted on Plate 1, Vicinity / Topographic Map.

A brief description of land use on nearby parcels is provided below. Plate 2, Site Plan, depicts the setting of the subject property and land use for adjacent sites.

North: An asphalt-paved alley is situated adjacent to the north with a residence and scattered small sheds beyond.

South: Northeast 79th Street, which trends in a northwest-to-southeast direction, is located adjacent to the south. A structure occupied by Frontier Bank and a building utilized by First Church of Christ Scientists are located beyond to the south.

East: 170th Avenue Northeast is located adjacent to the east. "Maxwell Place" (multi-story condominium building) is situated beyond to the east of the northern portion of the site. Earthwork construction is currently in progress for a new building nearby to the east of the southern portion of the site, beyond 170th Avenue Northeast.

West: A 2-story apartment building (16912 - NE 79th Street) is located on the parcel adjacent to the west with 169th Avenue Northeast beyond. Anderson Park is also located nearby to the west, beyond Northeast 79th Street. The City of Redmond Well #1 in Anderson Park (municipal water supply well) is located approximately 200 feet west of Overlake Cleaners, beyond Northeast 79th Street.

Soil Boring / Sample Collection

On June 29, 2007, EAI completed three (3) shallow interior soil borings (HB-1 through HB-3) and a shallow exterior soil boring (HB-4) at the approximate locations noted on Plate 3, Site Exploration Plan. Borings HB-1 through HB-3 were placed in accessible locations around the perimeter of the concrete foundation for the former dry cleaning machine. Several floor boards were temporarily removed to allow access through the crawl space to conduct the interior soil borings.

On July 2, 2007, EAI completed five (5) exterior soil borings (SB-1 through SB-5) at the approximate locations depicted on Plate 3, Site Exploration Plan.

Boring SB-1 was placed along the exterior northeast side of the Overlake Cleaners building in an inferred down-gradient location (relying solely upon the local northwesterly groundwater flow direction reported by ENSR in September 1997; (ENSR, 1997)) relative to the former dry-cleaner machine and immediately proximal to the location of shallow PCE-impacted soil sampled and tested by others in 1996-1997. Borings SB-2, SB-3, and SB-4 were placed nearby to the east, north, and west of boring SB-1, respectively in an effort to evaluate for the potential presence of PCE-impacted soil at those locations. The locations of numerous underground utilities, with approximate locations depicted on Plate 3, further influenced the locations of the exterior borings SB-1 through SB-4. Boring SB-1 was advanced to a depth of approximately 24 feet below the ground surface (bgs). Borings SB-2 through SB-4 were each advance to a depth of approximately 12 feet bgs.

Boring SB-5 was placed proximal to the location of an abandoned on-site sewer line as indicated by the client. The client advised EAI that this old on-site sewer line is approximately 4-to-6 feet below the ground surface and was abandoned several years ago when a washing machine was added within the southeastern portion of the Overlake Cleaners building and a new sewer line was installed farther to the south of the now abandoned line. Boring SB-5 was advanced to a depth of approximately 8 feet bgs.

Equipment employed to complete the borings included two (2) separate drilling units. The interior borings HB-1 through HB-3 and the exterior boring HB-4 were completed using a hand held stainless-steel Geo-Probe and/or a post-hole digger. The post-hole digger was used to remove shallow soils at the each boring locality HB-1 through HB-4. Continuous soil samples were collected in 1-to 1.5-foot intervals from borings HB-1 through HB-3 with a hollow sampling tube attached to the Geo-Probe unit. The interior borings were terminated at depths ranging from approximately 1.5-to 2.5 feet below the ground surface (elevation of the top of the spread footing of the concrete foundation for the former dry cleaning machine) owing to the texture of the soils (sandy gravel with large cobbles) which prevented deeper advancement of the borings using the hand-held Geo-Probe. As a technical footnote, much of the ground surface in the crawl space area beneath the Overlake Cleaners building was noted to be approximately 1.5-to-2 feet higher in elevation relative to the ground surface immediately proximal to the foundation of the former dry cleaning machine where borings HB-1 through HB-3 were advanced). Exterior boring HB-4 was advanced to approximately 12 inches below the ground surface using a post-hole digger, proximal to a now out-of-use wall-mounted fan on the northeastern side of the Overlake Cleaners building. EAI did not attempt to advance boring HB-4 deeper than 12 inches owing the relatively close proximity (within a few feet) of a buried active natural gas line to the sampling location.

For exterior borings SB-1 through SB-5, the truck-mounted Strataprobe was backed into position prior to drilling. The exterior borings SB-1 through SB-5 were then advanced in 3-to-4-foot increments at each location. This sampling method allowed for the collection of a continuous soil sample core beginning at the ground surface and extending to the maximum depth explored in each soil boring.

Upon recovery of each sample core from borings HB-1 through HB-4, the sampling device was opened and a sample was collected using the sampling guidelines of EPA method 5035A to (according to EPA) minimize the loss of volatile organic compounds (VOCs). Owing to the generally gravelly texture of soils encountered in borings SB-1 through SB-5, discrete soil samples were collected from each sampling interval of the core and transferred to sterilized 4-oz glass jars with teflon-sealed lids. A groundwater "grab" sample was also recovered from Boring SB-1 by inserting a temporary well screen into that boring.

Existing On-Site Monitoring Well Sampling

On July 3, 2007 EAI returned to the site to collected groundwater samples from the pre-existing on-site groundwater monitoring wells (depicted as "MW-1" and "MW-2", respectively on Plate 3, Site Exploration Plan).

Depth to groundwater, measured using a well probe in both of the sampled monitoring wells on July 3, 2007, was found to be approximately 23.5 feet below the top of the north side of the well casing (btwc) in MW-1 and approximately 22.77 feet btwc in MW-2. The diameter of each well was measured to be 2 inches. Approximately 15 gallons of water (approximately 30 gallons total) was purged from each sampled well using a peristaltic pump. Following developmental purging, the peristaltic pump was used to extract groundwater samples from both of the wells (at a depth of approximately 59 feet below the ground surface) which were poured into preconditioned labeled glassware furnished by the project laboratory.

A single sample of well purge water (stored in sealed and labeled plastic containers along the northeast side of the Overlake Cleaners building) was collected on July 5, 2007 for laboratory testing for disposal characterization purposes at the request of the client.

In an effort to preserve sample integrity, soil and groundwater samples were stored on-site in an insulated chest maintained at or below 4 degrees centigrade, and were transported to the project laboratory in this condition. Each sample was clearly identified with respect to project, boring number, date, time, etc. EPA-recommended sample management protocol, including maintenance of chain-of-custody documentation, was observed at each stage of the project.

Subsurface Conditions and Sample Selection

Subsurface soils encountered in the shallow hand borings HB-1 through HB-4 generally consisted of brownish fine to medium grained sand and silt with some large cobbles to the maximum explored depths of approximately 1-to-2.5 feet below the ground surface (bgs).

Subsurface soils encountered in the exterior Strataprobe borings SB-1 through SB-5 generally consisted of an upper approximately 2 feet of brown silty sand with some cobbles underlain by brown sandy gravel (with a minor percentage of silt) to the maximum explored depths. Groundwater was encountered at a depth of approximately 23 feet bgs in the deep boring SB-1. No groundwater seepage or water-saturated soils were encountered in borings SB-2 through SB-5. No obvious visual

discolorations or olfactory evidence (odors) suggestive of contamination were noted in any of the recovered soil or water samples.

Logs of SB-1 through SB-5 are provided in Appendix A, attached to this report. Two (2) photographs taken during drilling activities on July 2, 2007, are provided on Plate 4, Site Photographs.

In an effort to make a preliminary assessment of subsurface conditions proximal to the dry cleaner, EAI selected seventeen (17) soil samples (2 soil samples from each boring except for boring HB-4 from which one sample was collected) and the one (1) recovered groundwater "grab" sample (from boring SB-1) and the groundwater samples obtained from the two (2) on-site monitoring wells (MW-1 and MW-2) for laboratory analysis. The soil samples included the shallow soil samples from the upper 6-to-12 inches in borings HB-1 through HB-4 along with deeper soil samples collected at depths ranging from approximately 1.5-to-2.5 feet from interior borings HB-1 through HB-3. Soil samples collected from the exterior borings SB-1 through SB-5 included shallow soil samples from the upper 4 feet, along with two deeper soil samples from approximately 21 feet bgs in boring SB-1, from approximately 12 feet bgs in borings SB-2 through SB-4, and from approximately 8 feet bgs in boring SB-5.

Laboratory Analysis / Results

The seventeen (17) selected soil samples and three (3) collected groundwater samples were analyzed by the project laboratory for chlorinated volatile organic compounds (VOCs) by EPA test method 8260B.

As presented in Table 1 attached to this report, PCE was detected at concentrations <u>above</u> the current Model Toxics Control Act (MTCA) Method A cleanup level of 0.05 ppm in soil samples collected from <u>all three</u> of the interior hand borings (HB-1 through HB-3) and from two (2) of the exterior Strataprobe borings (0.08 ppm PCE in SB-1 at a depth range of 0-to-4 feet and 0.07 ppm PCE in SB-2 at a depth of approximately 12 feet). The highest reported PCE concentration was 0.65 parts-per-million (ppm) in the shallow soil sample collected from interior boring HB-2, proximal to the southern side of the former dry cleaner machine location, at a depth of approximately 6 inches below the ground surface (bgs). For reference the current MTCA Method A cleanup level for unrestricted land use is 0.05 ppm for PCE. The slightly deeper soil sample collected at approximately 2 feet bgs in interior borings HB-2 revealed no detectable PCE above the laboratory's lower detection limit of 0.1 ppm for that sample. PCE concentrations also decreased with depth in soil sampled from the two (2) other interior borings HB-1 and HB-3, from 0.08 ppm at approximately 1 foot deep in HB-1 to "none detected" (less than 0.05 ppm) at 2.5 feet in that boring, and from 0.25 ppm at approximately 6 inches deep in HB-3 to 0.11 ppm at approximately 1.5 feet deep in that boring.

None of PCE's common degradation products, including trichloroethene, dichloroethene, or vinyl chloride, were detected in any of the laboratory tested soil samples. No detectable concentrations of chlorinated volatile organic compounds were reported in laboratory tested soil samples collected from exterior borings HB-4, SB-3, SB-4, and SB-5. No detectable concentrations of methylene chloride were reported in any of the laboratory analyzed soil samples from borings HB-1 thorough HB-4 and borings SB-1 through SB-5.

As presented in Table 2 attached to this report, no detectable concentrations of chlorinated volatile organic compounds were reported in the groundwater "grab" sample collected from boring SB-1.

With respect to groundwater sampled from the two (2) pre-existing on-site monitoring wells MW-1 and MW-2, no detectable concentrations of chlorianted volatile organic compounds were reported in the laboratory tested groundwater samples collected from depths of approximately 59 feet below the ground surface in each of those monitoring wells.

In addition, no detectable concentrations of chlorinated volatile organic compounds were reported in the single sample of well purge water collected on July 5, 2007.

Copies of the laboratory reports are provided in Appendix-B.

Conclusions

Relying upon the results of this preliminary assessment, it would appear that impacts to subsurface soils by PCE (chlorinated dry cleaning solvent) at concentrations above the current Model Toxics Control Act (MTCA) Method A target cleanup level remain in shallow soils beneath the Overlake Cleaners building proximal to the former dry cleaner machine and in the nearby exterior area to the north, along with deeper soils (at approximately 12 feet below the ground surface) in the vicinity of exterior boring SB-2.

Postulated mechanisms which might account for these PCE detections include past incidental spillage of PCE proximal to the dry cleaning machine and near the back door of the Overlake Cleaners building, potential release(s) from a former exterior "dry cleaning water cooling discharge pipe" reported by the WDOE in1996 as located at that time proximal to the back door of Overlake Cleaners (immediate vicinity for boring SB-1), and, in the case of the detection at a depth of approximately 12 feet in boring SB-2, possible downward migration of PCE from PCE-impacted lint reported by others as present on the ground surface in that general area of the site in 1996 (WDOE, 1996) or related to possible lateral and downward migration of PCE from the shallower PCE-impacted soil discovered at the location of boring SB-1.

Relying upon the results of laboratory testing, and acknowledging the reported lower or "non-detect" concentrations of PCE in deeper soil samples (from approximately 1-to-2.5 feet below the ground surface) from the three (3) interior hand borings, EAI would tentatively conclude that PCE-impacted soils beneath the building, immediately proximal to the former dry cleaner machine, may be limited to depths of less than 4 feet below the ground surface. The full lateral extent of shallow PCE-impacted soils beneath the Overlake Cleaners building remains unknown at this time.

The full lateral and vertical extent of PCE impacted soil at the location of boring SB-1 remains unknown, however results of laboratory testing of a deeper soil sample collected from boring SB-1 suggests that the depth of PCE impacted soil at that location is less than 21 feet. On a positive note, relying upon the results of laboratory testing, groundwater sampled on July 2, 2007 from the aquifer at a depth of approximately 24 feet below the ground surface from boring SB-1 did not contain detectable concentrations of PCE or its common degradation by-products.

The full lateral and vertical extent of residual PCE-impacted soils detected in soil sampled from approximately 12 feet deep in boring SB-2 remains unknown at this time, nor was such a determination envisioned within the proposed scope of work for this phase of investigation.

EAI would recommend additional subsurface soil sampling and testing activities in an effort to resolve unknowns regarding the lateral and vertical extent of PCE impacted soils. Depending upon the findings of such additional evaluation, the most practical and potentially cost-effective remedation method for PCE-impacted soils at the property may be direct excavation for lawful off-site disposal. This remediation approach necessarily presumes that the on-site buildings would be demolished prior to commencement of cleanup work.

In response to the client's request regarding soil remedation costs related to PCE-impacted soils at the property, the following discussions are provided here for your consideration.

The following tentative presumptions regarding the potential extent of PCE-impacted subsurface soil at the property are given here as a basis for calculating potential minimum base costs for soil remediation. The client is advised that additional subsurface soil sampling and testing is recommended by EAI in an effort to better characterize the extent of PCE-impacted soils at the property discovered in the course of this current study (proximal to the former dry cleaning machine, in the immediate vicinity of boring SB-1, and in the vicinity of boring SB-2). The following discussions and approximate costs presume that PCE-impacted soils do not extend off-site. Costs given here are not to be construed as bids to conduct such work and are also exclusive of any groundwater monitoring costs or additional subsurface soil and/or groundwater sampling and testing activities.

1) If PCE-impacted shallow soils beneath the Overlake Cleaners building extend less than 4 feet below the ground and less than 15 feet laterally from the location of boring HB-2, and if the existing building is demolished permitting access for excavation of PCE-impacted shallow soils;

2) If PCE-impacted shallow soils detected at the location of exterior boring SB-1 extend less than 8 feet below the ground surface and extend less than 5 feet laterally from boring SB-1;

3) If PCE-impacted soils detected at a depth of approximately 12 feet below the ground surface at the location of exterior boring SB-2 extend less than 16 feet below the ground surface and are limited in lateral extend to less than 10 feet from boring SB-2;

Then a very approximate base cost for excavation and lawful off-site disposal of the PCE-impacted soil (assuming a total of approximately 64 tons of soil at $150 per ton for excavation and lawful off-site disposal and excavation backfilling, and assuming that a "contained end rule" exclusion letter can be obtained from the WDOE for disposal of the PCE-impacted soil at a local permitted landfill) may be at least on the order of $ 5,000 or more. Actual costs would only be known upon completion of such soil remediation activities at the property.

Relying upon the results of sampling and testing of groundwater collected from boring SB-1 on July 2, 2007 and from on-site monitoring wells MW-1 and MW-2 on July 3, 2007, it appears that groundwater quality at the locations and depths sampled and tested is currently compliant with applicable MTCA Method A or Method B cleanup levels with respect to chlorinated volatile organic compounds.

Following soil remediation activities, in an effort to obtain a "no further action:" (NFA) determination, the WDOE typically requires a minimum of four (4) consecutive quarters of groundwater monitoring (1 year of monitoring with sampling every 3 months) from at least three (3) on-site groundwater monitoring wells (and possibly from an off-site monitoring well(s) if PCE-impacted groundwater is suspected to be migrating off-site) that demonstrates compliance with MTCA target cleanup levels, along with measurements of on-site groundwater flow direction, before they (WDOE) will acknowledge that the groundwater has been remediated.

Decision making authority with regard to pursuing additional site explorations and/or future remedial actions, or consideration of other approaches, clearly lies with the client and/or other interested parties, depending upon their individual risk tolerances.

Finally, to achieve lawful compliance with Chapter 173-340-300, WAC and City of Redmond ordinances, EAI recommends that copies of this report along with any future reports regarding the environmental conditions thus far encountered at the property be forwarded to the Washington Department of Ecology and to the City of Redmond Wellhead Protection Program by the property owners in a timely manner.

Limitations

This report has been prepared for the exclusive use of J-Young, LLC, along with their several representatives for specific application to this site. Our work for this project was conducted 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, and in accordance with the terms and conditions set forth in our proposal dated June 13, 2007 and Change Order dated July 2, 2007. The opinions expressed in this report are based upon interpretations, observations and testing made at separated boring/sampling locations and conditions may vary between those locations or at other locations, media, or depths. Costs given in this report are not to be construed as bids to conduct such additional work. EAI understandably makes no warranty as to the accuracy, reliability, or completeness of works prepared by others cited herein. No other warranty, expressed or implied, is made. If new information is developed in future site work that may include excavations, borings, studies, etc., Environmental Associates, Inc., must be retained to reevaluate the conclusions of this report and to provide amendments as required.

We appreciate the opportunity to be of service on this assignment. If you have any questions or if we may be of additional service, please do not hesitate to contact us.

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Environmental Geologist / Project Manager

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Attachments

Plate 1: Vicinity / Topographic Map
Plate 2: Site Plan Overview
Plate 3: Site Exploration Plan
Plate 4: Site Photographs
Plate 5: PCE Results in Sampled Soils

Table 1 Soil Sampling Results
Table 2 Groundwater Sampling Results

Appendix-A Boring Logs - SB-1 through SB-5
Appendix-B Laboratory Reports
Appendix-C Copies of Select Documents Prepared by Others in 1996/1997

References

ENSR, October 29, 1997, Soil Sampling Results: August 14, 1997, Overlake Dry Cleaners, Redmond, Washington, ENSR Project 8700-810. 3 pps., attachments. Prepared for Stoel Rives, LLP.

North Creek Analytical (NCA), Results of groundwater sample analysis for samples collected by Geo Engineers on August 5, 2005 from well "OCMW-3" (City of Redmond monitoring well nearby to north of Overlake Cleaners according to the client). Copy of laboratory report provided by client.

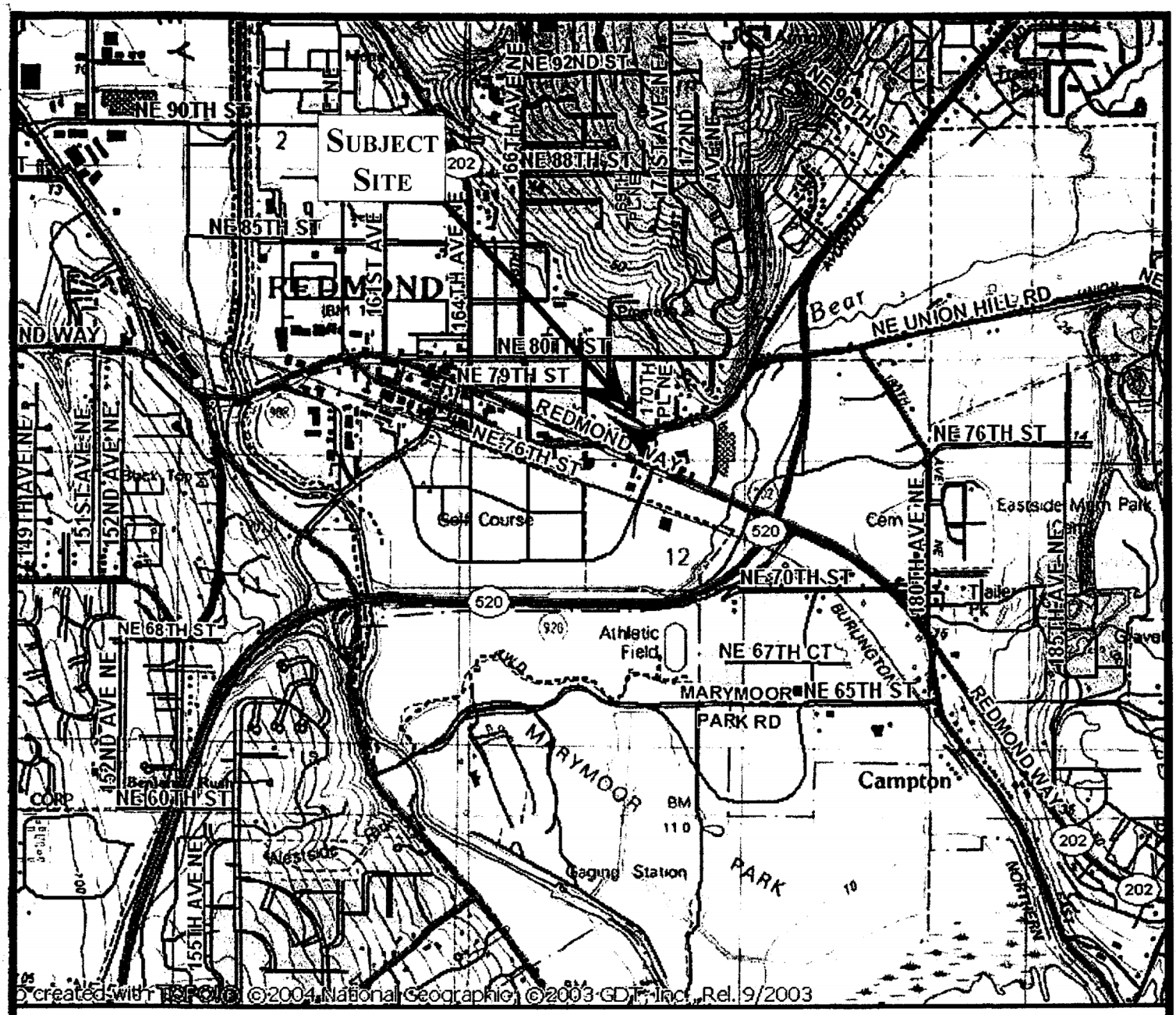
Stoel Rives, LLP (SLR), September 24, 1997, Re: Overlake Cleaners Groundwater Monitoring Wells, 2 pps., enclosures. Presented to Department of Ecology.

Stoel Rives, LLP, (SRL), November 3, 1997, Re: October 15, 1997 Meeting Among Overlake Cleaners, The City of Redmond, and Department of Ecology. 3 pps. Presented to Department of Ecology.

Washington Department of Ecology (WDOE), October 16, 1996, Department of Ecology Environmental Report Tracking System, Incident History, Incident ID: N25226, Redmond, Washington, Groundwater Wells 1 and 2. Caller name: Tom Fix of City of Redmond.

Washington Department of Ecology (WDOE), October 11, 1996, Initial Investigation at and around Anderson Park including Overlake Cleaners at 16940 NE 79th Street Redmond, Washington. 1 page letter. Presented to Mr. David Lee.

Washington Department of Ecology (WDOE), November 12, 1996, Initial Investigation Results and follow-up Information for Anderson Park area including Overlake Cleaners at 16940 NE 79th Street Redmond, Washington. 2 pages, enclosures. Presented to Mr. David Lee.



LEGEND:

★ **Approximate Site Location**

Probable Direction Of Local Groundwater Flow (ENSR, 1997).

N

Scale

0 — 1/2 — 1 mile

Contour Interval: 5 Meters

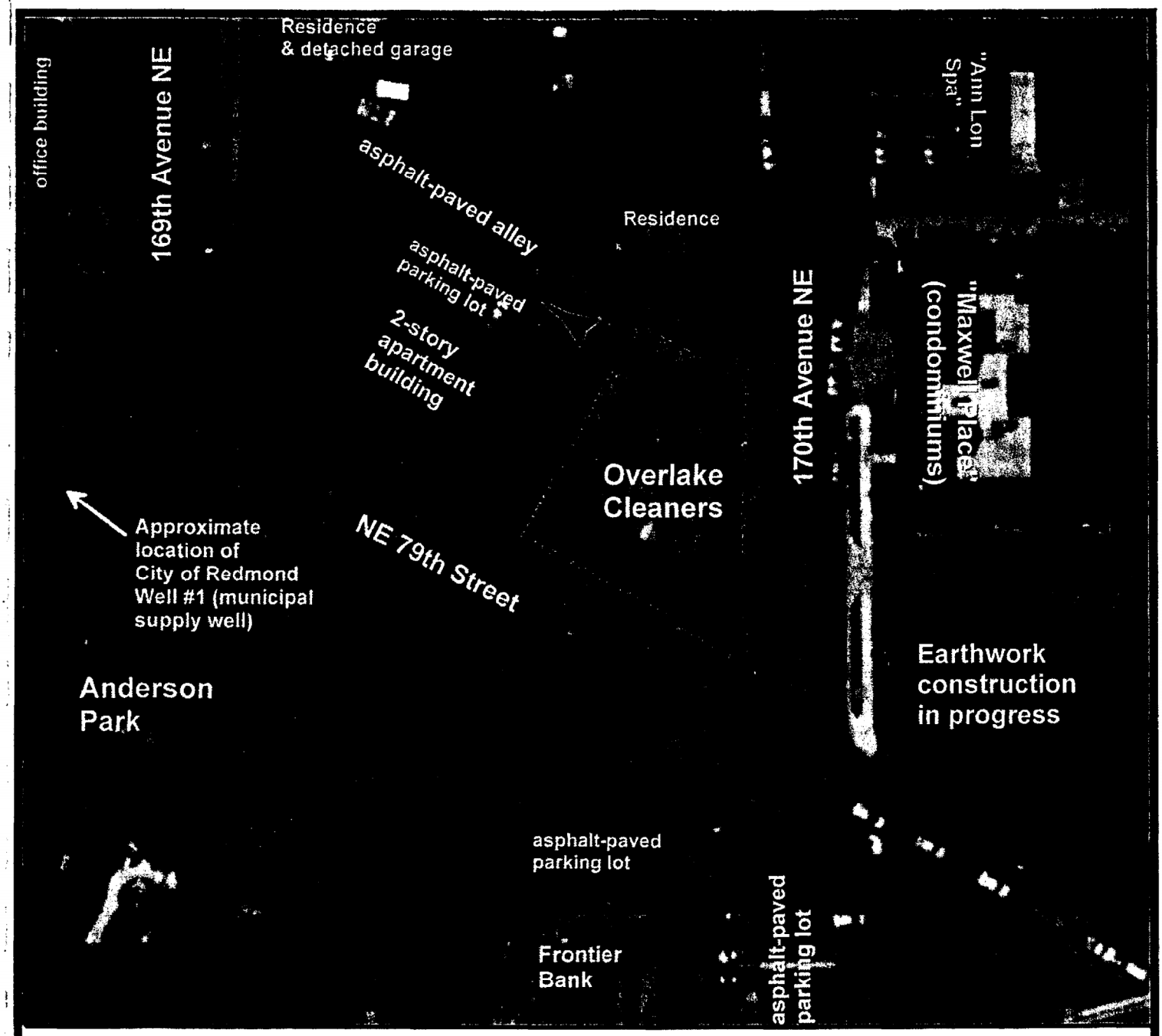
ENVIRONMENTAL ASSOCIATES, INC.

1380- 112th Avenue N.E., Ste. 300
Bellevue, Washington 98004

VICINITY/TOPOGRAPHIC MAP

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	*Date:*		*Plate:*
JN 27200	July 2007		1



LEGEND:

Probable direction of local groundwater flow (ENSR, 1997).

Approximate limits of subject property.

2002-Dated Image
(Source: U.S. Geological Survey)

N

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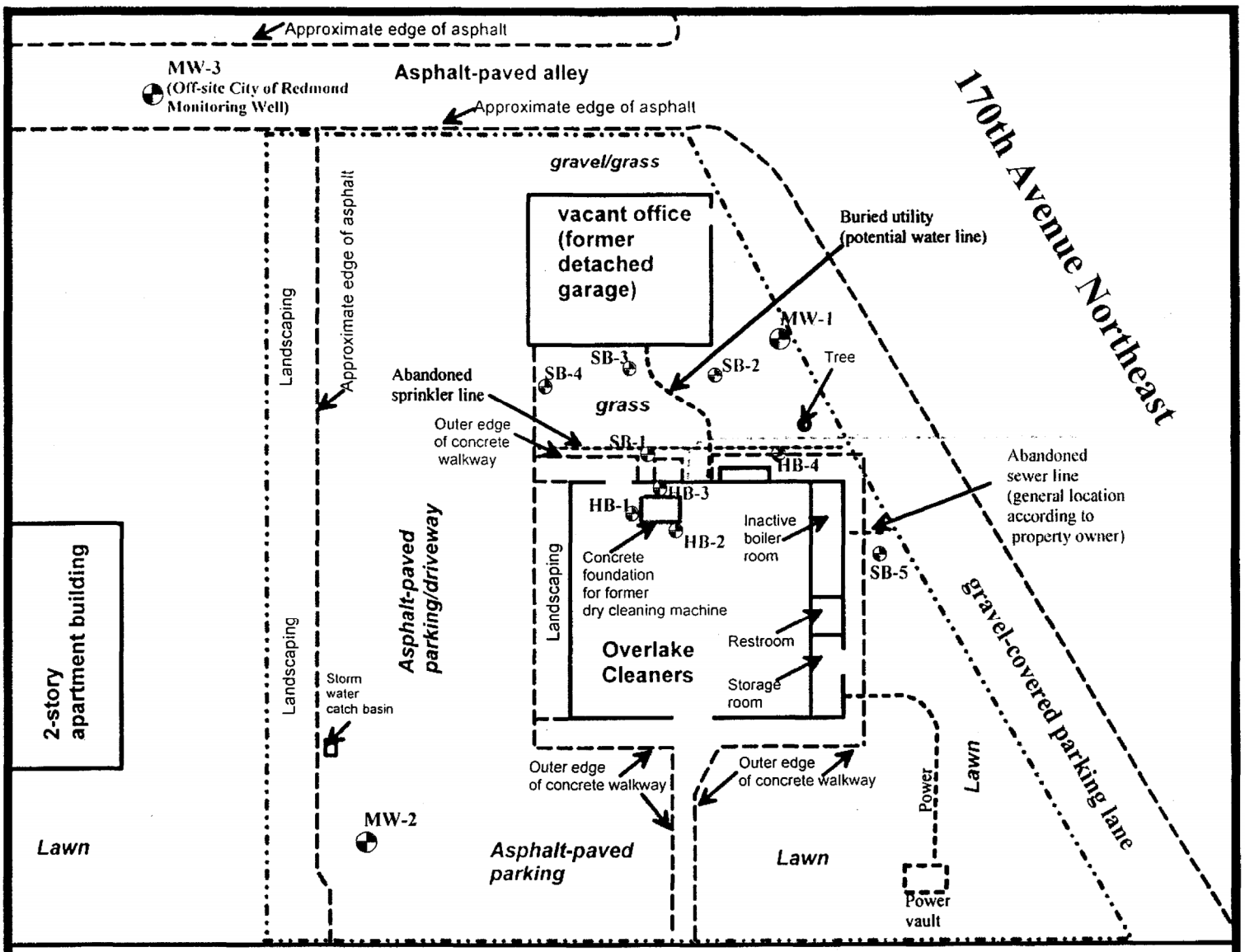
SITE PLAN OVERVIEW

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:		Plate:
JN 27200	July 2007		2



LEGEND:

Scale

0 — 20 feet

N

HB-1 SB-1 — Approximate locations of soil borings HB-1 through HB-4 conducted by EAI on June 29, 2007, and soil borings SB-1 through SB-5 conducted by EAI on July 2, 2007.

MW-1 — Approximate locations of pre-existing groundwater monitoring wells installed by others in 1997.

Approximate subject property limits.

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SITE EXPLORATION PLAN

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:		Plate:
JN 27200	July 2007		3

SOIL & GROUNDWATER SAMPLING & TESTING

Overlake Cleaners
16940 Northeast 79th Street
Redmond, Washington 98052

J-YOUNG, LLC

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July 12, 2007 JN-27200

Mr. David Lee
J-Young, LLC
16940 Northeast 79th Street
Redmond, Washington 98052

Subject: **SOIL & GROUNDWATER SAMPLING & TESTING**
Overlake Cleaners
16940 Northeast 79th Street
Redmond, Washington 98052

Dear Mr. Lee:

Environmental Associates, Inc. (EAI) has conducted limited sampling and laboratory testing of soil and groundwater at the above-referenced property located in Redmond, Washington. This letter report, prepared in accordance with the terms of our proposal dated June 13, 2007 and Change Order dated July 2, 2007, summarizes our approach to the project along with results and conclusions.

Project Background

During a site meeting with the client on June 11, 2007, EAI was advised that previous environmental work conducted by others in 1997 confirmed that a release of chlorinated dry cleaning solvent (tetrachloroethene, also known as perchloroethylene, PCE, or PERC) to shallow subsurface soils had occurred proximal to the former on-site dry cleaner machine. The client opined that the cause of the PERC release was from a small spill of PERC behind the dry cleaner machine which was present on the property approximately 10 years ago. The client advised that dry cleaning activities at the property began in approximately 1989 and ceased in February 2007. The property is now a "drop-off" point for dry cleaning which is performed at an off-site facility.

"Overlake Cleaners" (listed at 16940 NE 79th Street in Redmond, WA) appears on the WDOE's current listing of "Confirmed and Suspected Contaminated Sites" (CSCS) with a listed hazard ranking number of "1" (i.e. high priority).

Two (2) groundwater monitoring wells were installed on the property and one (1) off-site monitoring well was installed nearby to the north in an alley by others in 1997 in an effort to evaluate for the presence of PCE in groundwater. A City of Redmond municipal drinking water supply well is located in nearby Anderson Park, approximately 200 feet to the west of the site, beyond NE 79th Street. Copies of reports regarding the findings of the previous environmental studies conducted by others (ENSR, GeoEngineers, etc.) pertaining to the property were not made available to EAI from the client until the commencement of this current scope of work.

Review of documentation provided to us by the client (see copies of select documents Appendix C) revealed the following potentially significant findings:

- A September 27, 1996-dated "Department of Ecology Environmental Report Tracking System Incident History" summary advises that Mr. Tom Fix of the City of Redmond Water Department reported that "Redmond Municipal Wells 1 and 2 in Anderson Park have been picking up tetrachloroethylene (PCE) a dry cleaning solvent in municipal well pumpage since August 1996. Levels are currently around 3.5 ppb [parts-per-billion]. There is a suspected source dry cleaners (Overlake) directly across 79th Street from the well houses in the park". Reported concentrations of PCE in water pumped from the City of Redmond wells in Anderson Park at that time (August-to-September 1996) did not exceed the "maximum contaminant level" (MCL) of 5 ppb.

- An "Initial Investigation at and around Anderson Park including Overlake Cleaners" was performed by the Washington Department of Ecology (WDOE) in October 1996 in an effort to identify possible sources of PCE contamination detected in groundwater pumped from the City of Redmond's municipal water wells in Anderson Park. Laboratory testing of near-surface soil samples (collected from less than 12 inches deep) from locations generally described as "below fan location", "below building, dry cleaning machine, and slab", and "below water cooling discharge pipe" revealed PCE concentrations ranging from 50 parts-per-billion (ppb) to 977 ppb), which is <u>at or above the current</u> Model Toxics Control Act (MTCA) Method A cleanup level for PCE in soil. For reference, the Model Toxics Control Act (MTCA) Method A cleanup level for PCE in soil in 1996 was 500 ppb, and the <u>current</u> MTCA Method A cleanup level for PCE in soil is 50 ppb. Low concentrations of trichloroethylene (TCE) and methylene chloride <u>below the current</u> Model Toxics Control Act (MTCA) Method A cleanup level for TCE (30 ppb) and for methylene chloride (20 ppb) were reported in those near-surface soil samples collected by the WDOE at Overlake Cleaners in October 1996. Trace concentrations of 1,2 - dichloroethane ranging from 1.5 ppb to 9.5 ppb were also reported in those near-surface soil samples collected at Overlake Cleaners by the WDOE in October 1996. A laboratory tested sample of "fan lint"collected by the WDOE at Overlake Cleaners during their October 1996 study reportedly revealed an elevated PCE concentration of 1,220 ppb. Exact locations of those collected soil samples or "fan lint" at Overlake Cleaners were not clearly shown or described in the 1996-dated WDOE "Initial Investigation" report. Laboratory testing of water samples collected by the WDOE "...from dry cleaning water cooling discharge pipe" at Overlake Cleaners reportedly revealed trace concentrations of PCE at 2.9 ppb and 1.2 ppb, respectively.

- In August 1997, ENSR conducted additional near-surface soil sampling and laboratory testing at the Overlake Cleaners site. Ten (10) soil samples were collected from depths of less than 12 inches using hand tools from locations proximal to the back door of the dry cleaner, adjacent to the northeast side of the dry cleaning machine, and below the exterior side of the east-most wall fan on the northeast side of the building. Only three (3) of the samples were submitted for laboratory testing (samples collected from near the back door of the dry cleaner) which returned results of detectable PCE at concentrations ranging from 0.37 parts-per-million (ppm) to 5.6 ppm, which is above the current MTCA Method A cleanup level of 0.05 ppm for PCE in soil. The lateral and vertical extent of PCE-impacted soils was not characterized in the scope of ENSR's work at the site in 1997.

- On September 24, 1997 Stoel Rives, LLP (attorneys) presented a letter, which includes enclosures prepared by ENSR (in the form of boring logs, chain of custody record, a draft table of laboratory results, and two (2) figures depicting the locations of three (3) groundwater monitoring wells), addressed to the WDOE regarding the installation and sampling of two (2) existing on-site groundwater monitoring wells (MW-1 and MW-2) by ENSR at the Overlake Cleaners site in August-to-September 1997. The letter was signed by Mr. Richard A. Du Bey. Stoel Rives, LLP's (SRL's) September 24, 1997-dated letter advises that "...Overlake Cleaners was pleased to observe that the sample results from MW-2, the well closest to Anderson Park wells, tested clean and no PCE, methylene chloride or chloromethane was detected. Moreover, the groundwater gradient, as evidenced by the elevations taken from three wells, appears to be north/northwest" (SRL, 1997). Review of the enclosures with SRL's 1997-dated letter suggests that PCE was detected in the on-site monitoring well MW-1 (located northeast of the dry cleaning machine) at a concentration of 10.6 ppb (above the MTCA Method A cleanup level of 5 ppb for PCE in groundwater) in September 1997. PCE was also reportedly detected in the City of Redmond's groundwater monitoring well "MW-3" located in the asphalt-paved alley nearby to the north of the site at a concentration of 2.84 ppb. Trace concentrations of gasoline constituents benzene, toluene and xylenes (below their applicable MTCA Method A cleanup levels) were reported in groundwater sampled from the City of Redmond's monitoring well "MW-3" in September 1997. In a separate letter prepared by SRL addressed to the WDOE and dated November 3, 1997 titled "Re: October 15, 1997 Meeting Among Overlake Cleaners, The City of Redmond and Department of Ecology", SRL stated that "Based on the facts disclosed during the August 14, 1997 soil sampling event, the September 10, 1997 groundwater sampling event, and ENSR's analysis of those facts, ENSR has concluded that the source of the PCE impacting the Overlake Cleaners Redmond facility is an unknown upgradient source east of MW-1" (SLR, 1997).

- The client provided EAI with a copy of laboratory testing results for chlorinated solvents from a groundwater sample collected from the nearby off-site City of Redmond monitoring well "MW-3" by Geo Engineers on August 5, 2005. Review of the laboratory report suggests that no detectable concentrations of PCE or its degradation by-products of TCE, 1,2 dichloroethane, or vinyl chloride were reported in the laboratory tested groundwater sample collected by GeoEngineers during the August 5, 2005 sampling event.

Mr. Kevin Murphy of the City of Redmond Wellhead Protection Program advised EAI in the course of a telephone interview on June 29, 2007 that the City of Redmond's monitoring well located in the alley nearby to the north of Overlake Cleaners ("MW-3") was sampled within the last 6 months (approximately January 2007) and that trace PCE, below the MTCA Method A cleanup level of 5 ppb, was reported by laboratory testing of that groundwater sample. Documentation of that most recent sampling event of well MW-3 was not available to EAI at the time of this writing.

No documentation of soil and/or groundwater sampling and testing at the Overlake Cleaners property since September 1997 (if any) was provided to EAI by the client, nor was such found in our (EAI) review of information pertaining to Overlake Cleaners reviewed on-file at the Northwest Regional Office of the WDOE on July 12, 2007.

Methodology / Scope of Work

The client's desire to conduct a preliminary subsurface exploration proximal to/within the former on-site dry cleaner in an effort to make a tentative evaluation of the approximate lateral and vertical extent of the shallow PCE-impacted soil discovered by others in 1996-1997, along with sampling and testing of the two (2) on-site groundwater monitoring wells, formed the basis for the following current scope of work:

- Complete nine (9) soil borings in the vicinity of the former dry-cleaning machine inside Overlake Cleaners, and in the area proximal to the exterior northeast side of the building where shallow PCE-impacted soils were reportedly discovered by others in 1996-1997. One of the exterior borings was advanced to approximately 24 feet deep to collected a groundwater "grab sample" from proximal to the former dry cleaner machine.

- Collect groundwater samples from the two (2) pre-existing on-site monitoring wells (MW-1 and MW-2). Sampling of the existing City of Redmond monitoring well located in the alley nearby to the north of the site (MW-3) was not conducted as appropriate permits could not be obtained within the client-specified time frame for completion of the field work associated with this project (less than 2 weeks). Measurement of groundwater flow direction/gradient was not envisioned as part of this current scope of work.

- Collect and analyze select soil and groundwater samples from the borings and groundwater samples obtained from the two (2) on-site monitoring wells for chlorinated volatile organic compounds, which includes the dry-cleaning solvent tetrachloroethene (PCE) or "perc" and its common degradation products.

- Prepare a summary letter report documenting the methodology employed along with findings and conclusions.

Site Location

The subject property (Overlake Cleaners) is located at 16940 Northeast 79th Street (King County tax parcel # 77920900165) and covers approximately 9,106 square feet (0.21 acres) of land, in a mixed residential and commercial area of downtown Redmond, Washington. Existing improvements include a 1942-vintage single-story wood frame structure (former single-family residence converted to a dry cleaner during the 1980's) enclosing approximately 1,020 square feet of space. Additional improvements include a 1942-vintage wood frame structure (former detached garage converted to an office) enclosing approximately 300 square feet of space, and an asphalt-paved driveway and concrete walkways. The client advised EAI that dry cleaning activities at the property ceased in February 2007. The Overlake Cleaners building is presently used as a "drop off" point for dry cleaning which is now conducted at an off-site facility. The approximate location of the subject site is depicted on Plate 1, Vicinity / Topographic Map.

A brief description of land use on nearby parcels is provided below. Plate 2, Site Plan, depicts the setting of the subject property and land use for adjacent sites.

North: An asphalt-paved alley is situated adjacent to the north with a residence and scattered small sheds beyond.

South: Northeast 79th Street, which trends in a northwest-to-southeast direction, is located adjacent to the south. A structure occupied by Frontier Bank and a building utilized by First Church of Christ Scientists are located beyond to the south.

East: 170th Avenue Northeast is located adjacent to the east. "Maxwell Place" (multi-story condominium building) is situated beyond to the east of the northern portion of the site. Earthwork construction is currently in progress for a new building nearby to the east of the southern portion of the site, beyond 170th Avenue Northeast.

West: A 2-story apartment building (16912 - NE 79th Street) is located on the parcel adjacent to the west with 169th Avenue Northeast beyond. Anderson Park is also located nearby to the west, beyond Northeast 79th Street. The City of Redmond Well #1 in Anderson Park (municipal water supply well) is located approximately 200 feet west of Overlake Cleaners, beyond Northeast 79th Street.

Soil Boring / Sample Collection

On June 29, 2007, EAI completed three (3) shallow interior soil borings (HB-1 through HB-3) and a shallow exterior soil boring (HB-4) at the approximate locations noted on Plate 3, Site Exploration Plan. Borings HB-1 through HB-3 were placed in accessible locations around the perimeter of the concrete foundation for the former dry cleaning machine. Several floor boards were temporarily removed to allow access through the crawl space to conduct the interior soil borings.

On July 2, 2007, EAI completed five (5) exterior soil borings (SB-1 through SB-5) at the approximate locations depicted on Plate 3, Site Exploration Plan.

Boring SB-1 was placed along the exterior northeast side of the Overlake Cleaners building in an inferred down-gradient location (relying solely upon the local northwesterly groundwater flow direction reported by ENSR in September 1997; (ENSR, 1997)) relative to the former dry-cleaner machine and immediately proximal to the location of shallow PCE-impacted soil sampled and tested by others in 1996-1997. Borings SB-2, SB-3, and SB-4 were placed nearby to the east, north, and west of boring SB-1, respectively in an effort to evaluate for the potential presence of PCE-impacted soil at those locations. The locations of numerous underground utilities, with approximate locations depicted on Plate 3, further influenced the locations of the exterior borings SB-1 through SB-4. Boring SB-1 was advanced to a depth of approximately 24 feet below the ground surface (bgs). Borings SB-2 through SB-4 were each advance to a depth of approximately 12 feet bgs.

Boring SB-5 was placed proximal to the location of an abandoned on-site sewer line as indicated by the client. The client advised EAI that this old on-site sewer line is approximately 4-to-6 feet below the ground surface and was abandoned several years ago when a washing machine was added within the southeastern portion of the Overlake Cleaners building and a new sewer line was installed farther to the south of the now abandoned line. Boring SB-5 was advanced to a depth of approximately 8 feet bgs.

Equipment employed to complete the borings included two (2) separate drilling units. The interior borings HB-1 through HB-3 and the exterior boring HB-4 were completed using a hand held stainless-steel Geo-Probe and/or a post-hole digger. The post-hole digger was used to remove shallow soils at the each boring locality HB-1 through HB-4. Continuous soil samples were collected in 1-to 1.5-foot intervals from borings HB-1 through HB-3 with a hollow sampling tube attached to the Geo-Probe unit. The interior borings were terminated at depths ranging from approximately 1.5-to 2.5 feet below the ground surface (elevation of the top of the spread footing of the concrete foundation for the former dry cleaning machine) owing to the texture of the soils (sandy gravel with large cobbles) which prevented deeper advancement of the borings using the hand-held Geo-Probe. As a technical footnote, much of the ground surface in the crawl space area beneath the Overlake Cleaners building was noted to be approximately 1.5-to-2 feet higher in elevation relative to the ground surface immediately proximal to the foundation of the former dry cleaning machine where borings HB-1 through HB-3 were advanced). Exterior boring HB-4 was advanced to approximately 12 inches below the ground surface using a post-hole digger, proximal to a now out-of-use wall-mounted fan on the northeastern side of the Overlake Cleaners building. EAI did not attempt to advance boring HB-4 deeper than 12 inches owing the relatively close proximity (within a few feet) of a buried active natural gas line to the sampling location.

For exterior borings SB-1 through SB-5, the truck-mounted Strataprobe was backed into position prior to drilling. The exterior borings SB-1 through SB-5 were then advanced in 3-to-4-foot increments at each location. This sampling method allowed for the collection of a continuous soil sample core beginning at the ground surface and extending to the maximum depth explored in each soil boring.

Upon recovery of each sample core from borings HB-1 through HB-4, the sampling device was opened and a sample was collected using the sampling guidelines of EPA method 5035A to (according to EPA) minimize the loss of volatile organic compounds (VOCs). Owing to the generally gravelly texture of soils encountered in borings SB-1 through SB-5, discrete soil samples were collected from each sampling interval of the core and transferred to sterilized 4-oz glass jars with teflon-sealed lids. A groundwater "grab" sample was also recovered from Boring SB-1 by inserting a temporary well screen into that boring.

Existing On-Site Monitoring Well Sampling

On July 3, 2007 EAI returned to the site to collected groundwater samples from the pre-existing on-site groundwater monitoring wells (depicted as "MW-1" and "MW-2", respectively on Plate 3, Site Exploration Plan).

Depth to groundwater, measured using a well probe in both of the sampled monitoring wells on July 3, 2007, was found to be approximately 23.5 feet below the top of the north side of the well casing (btwc) in MW-1 and approximately 22.77 feet btwc in MW-2. The diameter of each well was measured to be 2 inches. Approximately 15 gallons of water (approximately 30 gallons total) was purged from each sampled well using a peristaltic pump. Following developmental purging, the peristaltic pump was used to extract groundwater samples from both of the wells (at a depth of approximately 59 feet below the ground surface) which were poured into preconditioned labeled glassware furnished by the project laboratory.

A single sample of well purge water (stored in sealed and labeled plastic containers along the northeast side of the Overlake Cleaners building) was collected on July 5, 2007 for laboratory testing for disposal characterization purposes at the request of the client.

In an effort to preserve sample integrity, soil and groundwater samples were stored on-site in an insulated chest maintained at or below 4 degrees centigrade, and were transported to the project laboratory in this condition. Each sample was clearly identified with respect to project, boring number, date, time, etc. EPA-recommended sample management protocol, including maintenance of chain-of-custody documentation, was observed at each stage of the project.

Subsurface Conditions and Sample Selection

Subsurface soils encountered in the shallow hand borings HB-1 through HB-4 generally consisted of brownish fine to medium grained sand and silt with some large cobbles to the maximum explored depths of approximately 1-to-2.5 feet below the ground surface (bgs).

Subsurface soils encountered in the exterior Strataprobe borings SB-1 through SB-5 generally consisted of an upper approximately 2 feet of brown silty sand with some cobbles underlain by brown sandy gravel (with a minor percentage of silt) to the maximum explored depths. Groundwater was encountered at a depth of approximately 23 feet bgs in the deep boring SB-1. No groundwater seepage or water-saturated soils were encountered in borings SB-2 through SB-5. No obvious visual

discolorations or olfactory evidence (odors) suggestive of contamination were noted in any of the recovered soil or water samples.

Logs of SB-1 through SB-5 are provided in Appendix A, attached to this report. Two (2) photographs taken during drilling activities on July 2, 2007, are provided on Plate 4, Site Photographs.

In an effort to make a preliminary assessment of subsurface conditions proximal to the dry cleaner, EAI selected seventeen (17) soil samples (2 soil samples from each boring except for boring HB-4 from which one sample was collected) and the one (1) recovered groundwater "grab" sample (from boring SB-1) and the groundwater samples obtained from the two (2) on-site monitoring wells (MW-1 and MW-2) for laboratory analysis. The soil samples included the shallow soil samples from the upper 6-to-12 inches in borings HB-1 through HB-4 along with deeper soil samples collected at depths ranging from approximately 1.5-to-2.5 feet from interior borings HB-1 through HB-3. Soil samples collected from the exterior borings SB-1 through SB-5 included shallow soil samples from the upper 4 feet, along with two deeper soil samples from approximately 21 feet bgs in boring SB-1, from approximately 12 feet bgs in borings SB-2 through SB-4, and from approximately 8 feet bgs in boring SB-5.

Laboratory Analysis / Results

The seventeen (17) selected soil samples and three (3) collected groundwater samples were analyzed by the project laboratory for chlorinated volatile organic compounds (VOCs) by EPA test method 8260B.

As presented in Table 1 attached to this report, PCE was detected at concentrations <u>above</u> the current Model Toxics Control Act (MTCA) Method A cleanup level of 0.05 ppm in soil samples collected from <u>all three</u> of the interior hand borings (HB-1 through HB-3) and from two (2) of the exterior Strataprobe borings (0.08 ppm PCE in SB-1 at a depth range of 0-to-4 feet and 0.07 ppm PCE in SB-2 at a depth of approximately 12 feet). The highest reported PCE concentration was 0.65 parts-per-million (ppm) in the shallow soil sample collected from interior boring HB-2, proximal to the southern side of the former dry cleaner machine location, at a depth of approximately 6 inches below the ground surface (bgs). For reference the current MTCA Method A cleanup level for unrestricted land use is 0.05 ppm for PCE. The slightly deeper soil sample collected at approximately 2 feet bgs in interior borings HB-2 revealed no detectable PCE above the laboratory's lower detection limit of 0.1 ppm for that sample. PCE concentrations also decreased with depth in soil sampled from the two (2) other interior borings HB-1 and HB-3, from 0.08 ppm at approximately 1 foot deep in HB-1 to "none detected" (less than 0.05 ppm) at 2.5 feet in that boring, and from 0.25 ppm at approximately 6 inches deep in HB-3 to 0.11 ppm at approximately 1.5 feet deep in that boring.

None of PCE's common degradation products, including trichloroethene, dichloroethene, or vinyl chloride, were detected in any of the laboratory tested soil samples. No detectable concentrations of chlorinated volatile organic compounds were reported in laboratory tested soil samples collected from exterior borings HB-4, SB-3, SB-4, and SB-5. No detectable concentrations of methylene chloride were reported in any of the laboratory analyzed soil samples from borings HB-1 thorough HB-4 and borings SB-1 through SB-5.

As presented in Table 2 attached to this report, no detectable concentrations of chlorinated volatile organic compounds were reported in the groundwater "grab" sample collected from boring SB-1.

With respect to groundwater sampled from the two (2) pre-existing on-site monitoring wells MW-1 and MW-2, no detectable concentrations of chlorianted volatile organic compounds were reported in the laboratory tested groundwater samples collected from depths of approximately 59 feet below the ground surface in each of those monitoring wells.

In addition, no detectable concentrations of chlorinated volatile organic compounds were reported in the single sample of well purge water collected on July 5, 2007.

Copies of the laboratory reports are provided in Appendix-B.

Conclusions

Relying upon the results of this preliminary assessment, it would appear that impacts to subsurface soils by PCE (chlorinated dry cleaning solvent) at concentrations above the current Model Toxics Control Act (MTCA) Method A target cleanup level remain in shallow soils beneath the Overlake Cleaners building proximal to the former dry cleaner machine and in the nearby exterior area to the north, along with deeper soils (at approximately 12 feet below the ground surface) in the vicinity of exterior boring SB-2.

Postulated mechanisms which might account for these PCE detections include past incidental spillage of PCE proximal to the dry cleaning machine and near the back door of the Overlake Cleaners building, potential release(s) from a former exterior "dry cleaning water cooling discharge pipe" reported by the WDOE in1996 as located at that time proximal to the back door of Overlake Cleaners (immediate vicinity for boring SB-1), and, in the case of the detection at a depth of approximately 12 feet in boring SB-2, possible downward migration of PCE from PCE-impacted lint reported by others as present on the ground surface in that general area of the site in 1996 (WDOE, 1996) or related to possible lateral and downward migration of PCE from the shallower PCE-impacted soil discovered at the location of boring SB-1.

Relying upon the results of laboratory testing, and acknowledging the reported lower or "non-detect" concentrations of PCE in deeper soil samples (from approximately 1-to-2.5 feet below the ground surface) from the three (3) interior hand borings, EAI would tentatively conclude that PCE-impacted soils beneath the building, immediately proximal to the former dry cleaner machine, may be limited to depths of less than 4 feet below the ground surface. The full lateral extent of shallow PCE-impacted soils beneath the Overlake Cleaners building remains unknown at this time.

The full lateral and vertical extent of PCE impacted soil at the location of boring SB-1 remains unknown, however results of laboratory testing of a deeper soil sample collected from boring SB-1 suggests that the depth of PCE impacted soil at that location is less than 21 feet. On a positive note, relying upon the results of laboratory testing, groundwater sampled on July 2, 2007 from the aquifer at a depth of approximately 24 feet below the ground surface from boring SB-1 did not contain detectable concentrations of PCE or its common degradation by-products.

The full lateral and vertical extent of residual PCE-impacted soils detected in soil sampled from approximately 12 feet deep in boring SB-2 remains unknown at this time, nor was such a determination envisioned within the proposed scope of work for this phase of investigation.

EAI would recommend additional subsurface soil sampling and testing activities in an effort to resolve unknowns regarding the lateral and vertical extent of PCE impacted soils. Depending upon the findings of such additional evaluation, the most practical and potentially cost-effective remedation method for PCE-impacted soils at the property may be direct excavation for lawful off-site disposal. This remediation approach necessarily presumes that the on-site buildings would be demolished prior to commencement of cleanup work.

In response to the client's request regarding soil remedation costs related to PCE-impacted soils at the property, the following discussions are provided here for your consideration.

The following tentative presumptions regarding the potential extent of PCE-impacted subsurface soil at the property are given here as a basis for calculating potential minimum base costs for soil remediation. The client is advised that additional subsurface soil sampling and testing is recommended by EAI in an effort to better characterize the extent of PCE-impacted soils at the property discovered in the course of this current study (proximal to the former dry cleaning machine, in the immediate vicinity of boring SB-1, and in the vicinity of boring SB-2). The following discussions and approximate costs presume that PCE-impacted soils do not extend off-site. Costs given here are not to be construed as bids to conduct such work and are also exclusive of any groundwater monitoring costs or additional subsurface soil and/or groundwater sampling and testing activities.

1) If PCE-impacted shallow soils beneath the Overlake Cleaners building extend less than 4 feet below the ground and less than 15 feet laterally from the location of boring HB-2, and if the existing building is demolished permitting access for excavation of PCE-impacted shallow soils;

2) If PCE-impacted shallow soils detected at the location of exterior boring SB-1 extend less than 8 feet below the ground surface and extend less than 5 feet laterally from boring SB-1;

3) If PCE-impacted soils detected at a depth of approximately 12 feet below the ground surface at the location of exterior boring SB-2 extend less than 16 feet below the ground surface and are limited in lateral extend to less than 10 feet from boring SB-2;

Then a very approximate base cost for excavation and lawful off-site disposal of the PCE-impacted soil (assuming a total of approximately 64 tons of soil at $150 per ton for excavation and lawful off-site disposal and excavation backfilling, and assuming that a "contained end rule" exclusion letter can be obtained from the WDOE for disposal of the PCE-impacted soil at a local permitted landfill) may be at least on the order of $ 5,000 or more. Actual costs would only be known upon completion of such soil remediation activities at the property.

Relying upon the results of sampling and testing of groundwater collected from boring SB-1 on July 2, 2007 and from on-site monitoring wells MW-1 and MW-2 on July 3, 2007, it appears that groundwater quality at the locations and depths sampled and tested is currently compliant with applicable MTCA Method A or Method B cleanup levels with respect to chlorinated volatile organic compounds.

Following soil remediation activities, in an effort to obtain a "no further action:" (NFA) determination, the WDOE typically requires a minimum of four (4) consecutive quarters of groundwater monitoring (1 year of monitoring with sampling every 3 months) from at least three (3) on-site groundwater monitoring wells (and possibly from an off-site monitoring well(s) if PCE-impacted groundwater is suspected to be migrating off-site) that demonstrates compliance with MTCA target cleanup levels, along with measurements of on-site groundwater flow direction, before they (WDOE) will acknowledge that the groundwater has been remediated.

Decision making authority with regard to pursuing additional site explorations and/or future remedial actions, or consideration of other approaches, clearly lies with the client and/or other interested parties, depending upon their individual risk tolerances.

Finally, to achieve lawful compliance with Chapter 173-340-300, WAC and City of Redmond ordinances, EAI recommends that copies of this report along with any future reports regarding the environmental conditions thus far encountered at the property be forwarded to the Washington Department of Ecology and to the City of Redmond Wellhead Protection Program by the property owners in a timely manner.

Limitations

This report has been prepared for the exclusive use of J-Young, LLC, along with their several representatives for specific application to this site. Our work for this project was conducted 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, and in accordance with the terms and conditions set forth in our proposal dated June 13, 2007 and Change Order dated July 2, 2007. The opinions expressed in this report are based upon interpretations, observations and testing made at separated boring/sampling locations and conditions may vary between those locations or at other locations, media, or depths. Costs given in this report are not to be construed as bids to conduct such additional work. EAI understandably makes no warranty as to the accuracy, reliability, or completeness of works prepared by others cited herein. No other warranty, expressed or implied, is made. If new information is developed in future site work that may include excavations, borings, studies, etc., Environmental Associates, Inc., must be retained to reevaluate the conclusions of this report and to provide amendments as required.

We appreciate the opportunity to be of service on this assignment. If you have any questions or if we may be of additional service, please do not hesitate to contact us.

Chris Cass, P.G.
Environmental Geologist / Project Manager

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Don W. Spencer, M.Sc., P.G., R.E.A.
Principal

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I.D. # AM 48151

EPA/HUD Certified Lead Inspector (Licensed)

Registered Site Assessor/Licensed UST Supervisor
State Certification #0878545-U7

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License: 11464	(Oregon)
License: 876	(California)
License: 5195	(Illinois)
License: 0327	(Mississippi)

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DON W. SPENCER

State of Washington Registered 2628 Licensed Geologist
CHRIS G. CASS

Attachments

Plate 1: Vicinity / Topographic Map
Plate 2: Site Plan Overview
Plate 3: Site Exploration Plan
Plate 4: Site Photographs
Plate 5: PCE Results in Sampled Soils

Table 1 Soil Sampling Results
Table 2 Groundwater Sampling Results

Appendix-A Boring Logs - SB-1 through SB-5
Appendix-B Laboratory Reports
Appendix-C Copies of Select Documents Prepared by Others in 1996/1997

References

ENSR, October 29, 1997, Soil Sampling Results: August 14, 1997, Overlake Dry Cleaners, Redmond, Washington, ENSR Project 8700-810. 3 pps., attachments. Prepared for Stoel Rives, LLP.

North Creek Analytical (NCA), Results of groundwater sample analysis for samples collected by Geo Engineers on August 5, 2005 from well "OCMW-3" (City of Redmond monitoring well nearby to north of Overlake Cleaners according to the client). Copy of laboratory report provided by client.

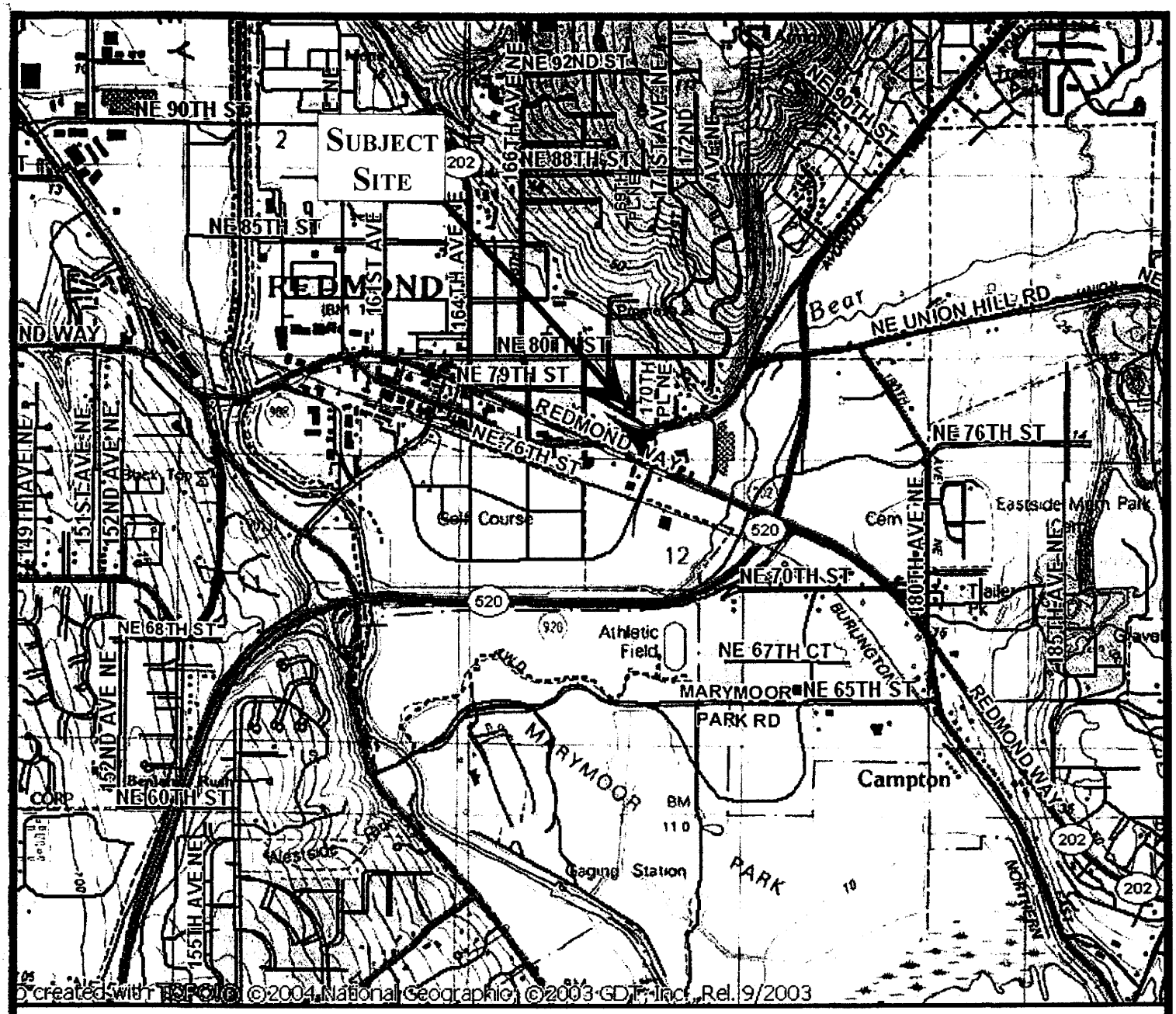
Stoel Rives, LLP (SLR), September 24, 1997, Re: Overlake Cleaners Groundwater Monitoring Wells, 2 pps., enclosures. Presented to Department of Ecology.

Stoel Rives, LLP, (SRL), November 3, 1997, Re: October 15, 1997 Meeting Among Overlake Cleaners, The City of Redmond, and Department of Ecology. 3 pps. Presented to Department of Ecology.

Washington Department of Ecology (WDOE), October 16, 1996, Department of Ecology Environmental Report Tracking System, Incident History, Incident ID: N25226, Redmond, Washington, Groundwater Wells 1 and 2. Caller name: Tom Fix of City of Redmond.

Washington Department of Ecology (WDOE), October 11, 1996, Initial Investigation at and around Anderson Park including Overlake Cleaners at 16940 NE 79th Street Redmond, Washington. 1 page letter. Presented to Mr. David Lee.

Washington Department of Ecology (WDOE), November 12, 1996, Initial Investigation Results and follow-up Information for Anderson Park area including Overlake Cleaners at 16940 NE 79th Street Redmond, Washington. 2 pages, enclosures. Presented to Mr. David Lee.



LEGEND:

★ **Approximate Site Location**

Probable Direction Of Local Groundwater Flow (ENSR, 1997).

N

Scale

0 *1/2* *1 mile*

Contour Interval: 5 Meters

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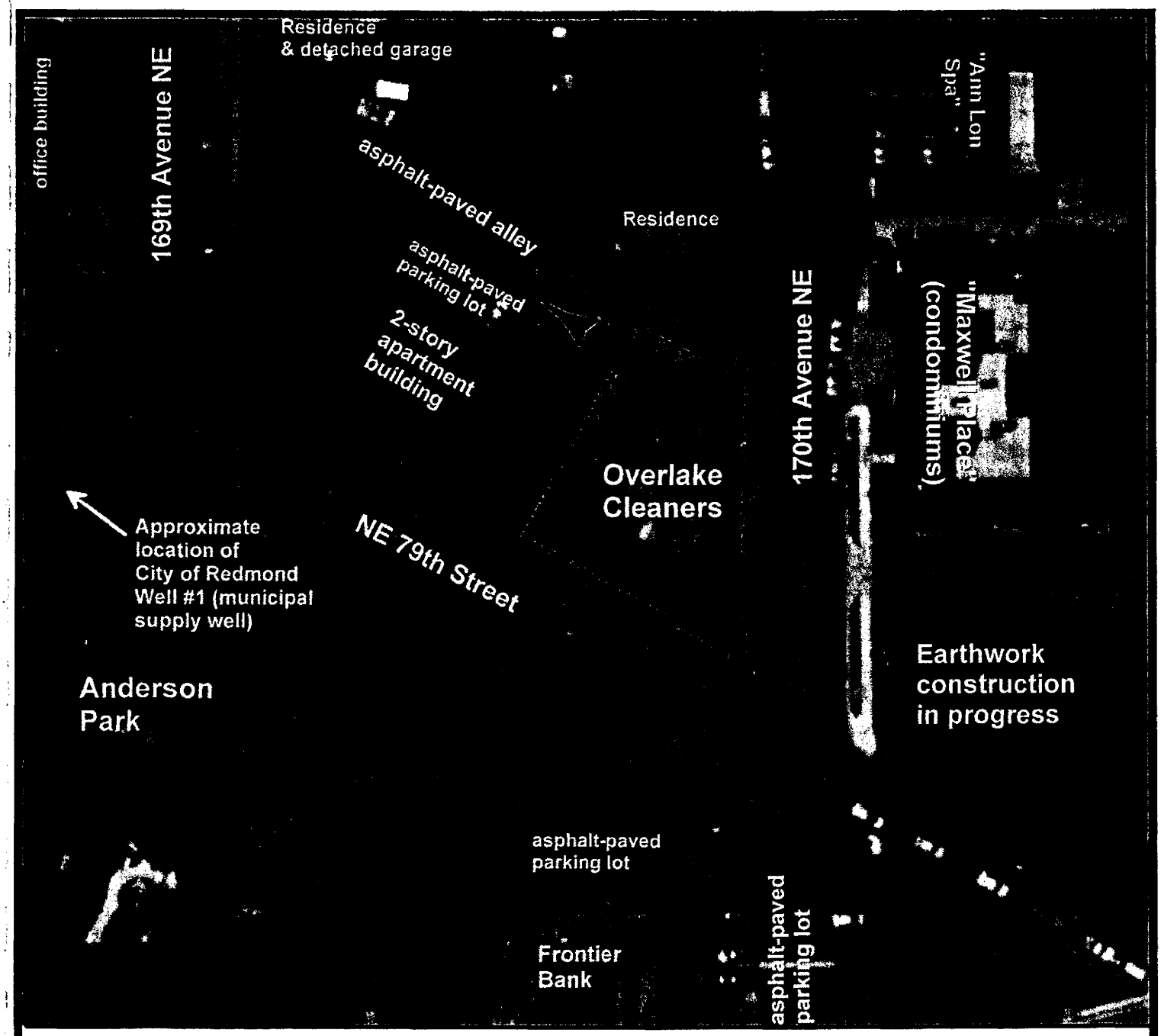
Bellevue, Washington 98004

VICINITY/TOPOGRAPHIC MAP

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	*Date:*		*Plate:*
JN 27200	July 2007		1



LEGEND:

Probable direction of local groundwater flow (ENSR, 1997).

Approximate limits of subject property.

2002-Dated Image
(Source: U.S. Geological Survey)

N

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ASSOCIATES, INC.

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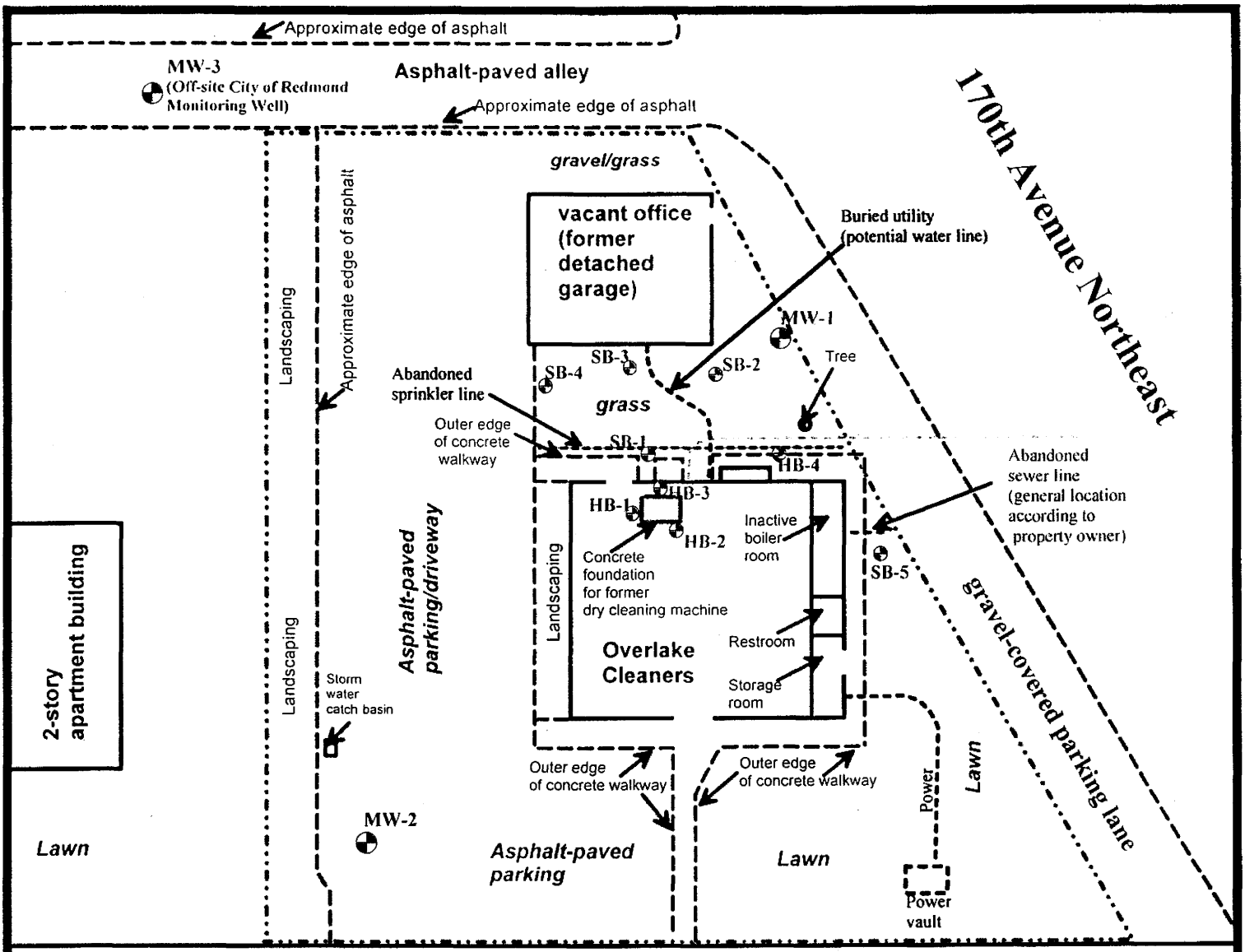
Bellevue, Washington 98004

SITE PLAN OVERVIEW

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	*Date:*		*Plate:*
JN 27200	July 2007		2



LEGEND:

Scale

0 — 20 feet

N

HB-1 SB-1 — Approximate locations of soil borings HB-1 through HB-4 conducted by EAI on June 29, 2007, and soil borings SB-1 through SB-5 conducted by EAI on July 2, 2007.

MW-1 — Approximate locations of pre-existing groundwater monitoring wells installed by others in 1997.

Approximate subject property limits.

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SITE EXPLORATION PLAN

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:		Plate:
JN 27200	July 2007		3

Advancing boring SB-1; July 2, 2007.

Drilling of boring SB-5; July 2, 2007.

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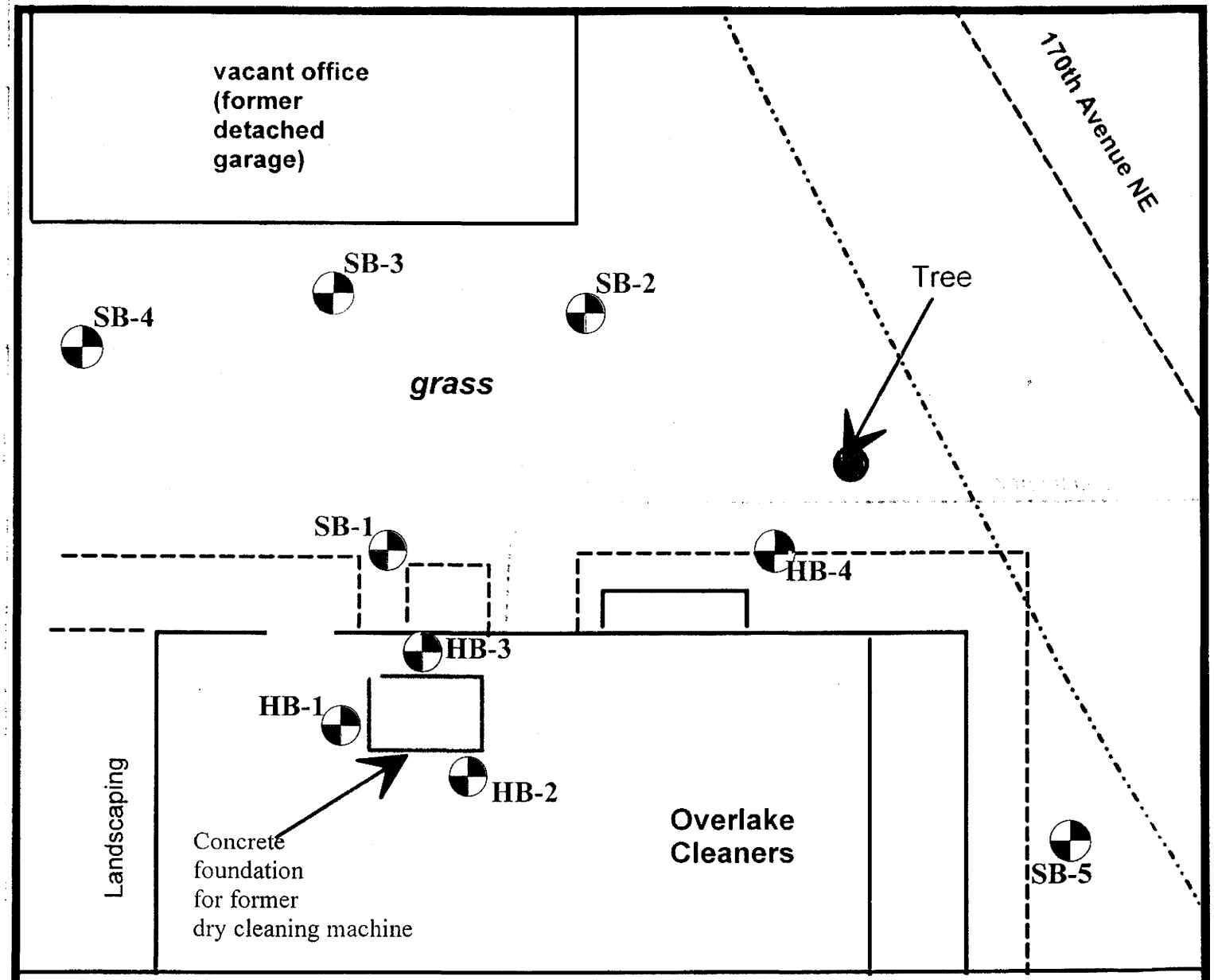
SITE PHOTOGRAPHS

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	*Date:*		*Plate:*
JN 27200	July 2007		4



0 **Scale** 25 feet

N

PCE detected above Model Toxics Control Act (MTCA) Method A cleanup level. (Red shading)

PCE not detected above Model Toxics Control Act (MTCA) Method A cleanup leve at locations and depths sampled and tested. (black shading)

Approximate subject property limits.

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PCE Results in Sampled Soils

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:		Plate:
JN 27200	July 2007		5

TABLE 1 - Chlorinated VOCs - Soil Sampling Results

Sampling Dates: June 29, 2007 (HB-1 through HB-4) & July 2, 2007 (SB-1 through SB-5)

Overlake Cleaners - 16940 NE 79th Street, Redmond, Washington

All results and limits in parts per million (ppm)

Boring / Sample	Tetrachloroethene (PCE)	Trichloroethene (TCE)	(cis) 1,2 Dichloroethene	(trans) 1,2 Dichloroethene	Vinyl Chloride	1,1 Dichloroethane	1,2 Dichloroethane	1,1,1 Trichloroethane
HB-1-1	***0.08***	<0.04	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06
HB-1-2.5	<0.05	<0.03	<0.05	<0.05	<0.05	<0.5	<0.05	<0.05
HB-2-0.5	***0.65***	<0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HB-2-2	<0.1	<0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HB-3-0.5	***0.25***	<0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HB-3-1.5	***0.11***	<0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
HB-4-1	<0.06	<0.04	<0.06	<0.06	<0.06	<0.6	<0.06	<0.06
SB-1-4	***0.1***	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-1-21	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-2-1	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-2-12	***0.07***	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-3-4	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-3-12	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-4-1	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-4-12	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-5-4	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
SB-5-8	<0.05	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Reporting Limit [1]	0.05	0.03	0.05	0.05	0.05	0.05	0.05	0.05
Cleanup Level for Unrestricted Land Use (Method-A) [2]	0.05	0.03	---	---	---	---	---	2
Cleanup Level - Direct Contact (Method-B) [3]	19.6	90	35,000	70,000	0.667	8,000	11	72,000

Notes:

1- "Reporting Limit" represents the laboratory lower quantitation limit.
2- Method A soil cleanup levels for unrestricted land use as published in the Model Toxics Control Act (MTCA) 173-340-WAC, Table 740-1. Amended February 12, 2001.
3- Method-B soil cleanup levels for the "direct contact pathway", as published in Ecology's CLARC version 3.0, August 2001 database.

Bold and Italics denotes concentrations above existing MTCA Method A or B soil cleanup levels.

TABLE 2 - Chlorinated VOCs - Groundwater Sampling Results

Sampling Dates: July 2, 2007 (SB-1) & July 3, 2007 (MW-1 & MW-2)

Overlake Cleaners - 16940 NE 79th Street, Redmond, Washington

All results and limits in parts per billion (ppb)

Boring / Monitoring Well	Tetrachloroethene (PCE)	Trichloroethene (TCE)	(cis) 1,2 Dichloroethene	(trans) 1,2 Dichloroethene	Vinyl Chloride	Chloroethane	1,1 Dichloroethane	1,2 Dichloroethane	1,1,1 Trichloroethane
SB-1	<1	<1	<1	<1	<0.2[1]	<1	<1	<1	<1
MW-1	<1	<1	<1	<1	<0.2[1]	<1	<1	<1	<1
MW-2	<1	<1	<1	<1	<0.2[1]	<1	<1	<1	<1
Reporting Limit[2]	1	1	1	1	0.2[1]	1	1	1	1
Existing Cleanup Level[3]	5 (A)	5 (A)	80 (B)	160 (B)	0.2 (A)	---	800 (B)	5(A)	200(A)

Notes:

1 - Result is below normal reporting limits. The value reported is an estimate.

2- "Reporting Limit" represents the laboratory lower quantitation limit.

3- Method A or B groundwater cleanup levels as published in the Model Toxics Control Act (MTCA) 173-340-WAC, amended 2/12/01.

APPENDIX -A

Boring Logs

BORING SB-1

Depth/ Sample	PID (ppm)	Moisture/ Water Table	Density	USCS	DESCRIPTION
0	5.3	Damp	Hard	sm	Silty sand, brownish fine to medium grained sand and silt, with some cobbles.
5	6.1	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
10	6.1	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
15	7.3	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
20	6.2 7.3	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
		Wet			No soil sample recovery
25					
30					
35					Boring abandoned with granular bentonite.
40					Boring terminated at 24 feet. Groundwater encountered at approximately 23 feet. Groundwater sample collected by inserting a temporary well screen.

Sampler: Continuous Sample collected in 3-to-4-foot sections.
Driller: ESN-Strataprobe

ENVIRONMENTAL ASSOCIATES, INC.

1380 - 112th Avenue NE, Suite 300
Bellevue, Washington 98004

BORING SB-1

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:	Logged by:	Plate:
JN-27200	07/02/2007	CGC	A-1

BORING SB-2

Depth/ Sample	PID Reading (ppm)	Moisture/ Water Table	Density	USCS	DESCRIPTION
0	13.3	Damp	Hard	sm	Silty sand, brownish fine to medium grained sand and silt, with some cobbles.
	12.8	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
5	9.4	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
10	10.2	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
					Boring abandoned with granular bentonite.
					Boring terminated at 12 feet. No groundwater seepage encountered.
15					
20					

Driller: Environmental Services Northwest

ENVIRONMENTAL ASSOCIATES, INC.

1380 - 112th Avenue N.E., Suite 300
Bellevue, Washington 98004

Boring: SB-2

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:	Logged by:	Plate:
JN-27200	07/02/2007	CGC	A-2

BORING SB-3

Depth/ Sample	PID Reading (ppm)	Moisture/ Water Table	Density	USCS	DESCRIPTION
0		Damp	Hard	sm	Silty sand, brownish fine to medium grained sand and silt, with some cobbles.
	10.2	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
5					
	11.7	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
10	11.7	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
					Boring abandoned with granular bentonite.
					Boring terminated at 12 feet. No groundwater seepage encountered.
15					
20					

Driller: Environmental Services Northwest

ENVIRONMENTAL ASSOCIATES, INC.

1380 - 112th Avenue N.E., Suite 300
Bellevue, Washington 98004

Boring: SB-3

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:	Logged by:	Plate:
JN-27200	07/02/2007	CGC	A-3

BORING SB-4

Depth/ Sample	PID Reading (ppm)	Moisture/ Water Table	Density	USCS	DESCRIPTION
0	12.0	Damp	Hard	sm	Silty sand, brownish fine to medium grained sand and silt, with some cobbles.
	11.4	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
5	13.3	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
10	13.2	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
					Boring abandoned with granular bentonite.
					Boring terminated at 12 feet. No groundwater seepage encountered.
15					
20					

Driller: Environmental Services Northwest

ENVIRONMENTAL ASSOCIATES, INC.

1380 - 112th Avenue N.E., Suite 300
Bellevue, Washington 98004

Boring: SB-4

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:	Logged by:	Plate:
JN-27200	07/02/2007	CGC	A-4

BORING SB-5

Depth/ Sample	PID Reading (ppm)	Moisture/ Water Table	Density	USCS	DESCRIPTION
0		Damp	Hard	sm	Silty sand, brownish fine to medium grained sand and silt, with some cobbles.
	8.2	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
5					
	9.0	Damp	Hard	gp	Sandy Gravel, brownish fine to medium grained sand, minor silt, predominately cobbles.
					Boring abandoned with granular bentonite.
10					Boring terminated at ~8 feet. No groundwater seepage encountered.
15					
20					

Driller: Environmental Services Northwest

ENVIRONMENTAL ASSOCIATES, INC.

1380 - 112th Avenue N.E., Suite 300
Bellevue, Washington 98004

Boring: SB-5

Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Job Number:	Date:	Logged by:	Plate:
JN-27200	07/02/2007	CGC	A-5

APPENDIX -B

Laboratory Reports

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

July 10, 2007

Chris Cass, Project Manager
Environmental Associates, Inc.
1380 112th Ave. NE, #300
Bellevue, WA 98004

Dear Mr. Cass:

Included are the results from the testing of material submitted on July 2, 2007 from the Overlake Cleaners /JN-27200, F&BI 707025 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
EAI0710R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-1-1	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-01
Date Analyzed:	07/05/07	Data File:	070513.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	90	56	118
1,2-Dichloroethane-d4	85	59	116
Toluene-d8	90	51	121
4-Bromofluorobenzene	96	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.06
Chloroethane	<0.6
1,1-Dichloroethene	<0.06
Methylene chloride	<0.6
trans-1,2-Dichloroethene	<0.06
1,1-Dichloroethane	<0.06
cis-1,2-Dichloroethene	<0.06
1,2-Dichloroethane (EDC)	<0.06
1,1,1-Trichloroethane	<0.06
Trichloroethene	<0.04
Tetrachloroethene	0.08

Note: Detection limits are raised due to an insufficient amount of sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-1-2.5	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-02
Date Analyzed:	07/05/07	Data File:	070514.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	88	56	118
1,2-Dichloroethane-d4	85	59	116
Toluene-d8	90	51	121
4-Bromofluorobenzene	95	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-2-0.5	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-03
Date Analyzed:	07/05/07	Data File:	070515.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	88	56	118
1,2-Dichloroethane-d4	80	59	116
Toluene-d8	90	51	121
4-Bromofluorobenzene	93	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.1
Chloroethane	<1
1,1-Dichloroethene	<0.1
Methylene chloride	<1
trans-1,2-Dichloroethene	<0.1
1,1-Dichloroethane	<0.1
cis-1,2-Dichloroethene	<0.1
1,2-Dichloroethane (EDC)	<0.1
1,1,1-Trichloroethane	<0.1
Trichloroethene	<0.06
Tetrachloroethene	0.65

Note: Detection limits are raised due to an insufficient amount of sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-2-2	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-04
Date Analyzed:	07/05/07	Data File:	070516.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	85	56	118
1,2-Dichloroethane-d4	80	59	116
Toluene-d8	88	51	121
4-Bromofluorobenzene	89	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.1
Chloroethane	<1
1,1-Dichloroethene	<0.1
Methylene chloride	<1
trans-1,2-Dichloroethene	<0.1
1,1-Dichloroethane	<0.1
cis-1,2-Dichloroethene	<0.1
1,2-Dichloroethane (EDC)	<0.1
1,1,1-Trichloroethane	<0.1
Trichloroethene	<0.06
Tetrachloroethene	<0.1

Note: Detection limits are raised due to an insufficient amount of sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-3-0.5	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-05
Date Analyzed:	07/05/07	Data File:	070517.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	85	56	118
1,2-Dichloroethane-d4	81	59	116
Toluene-d8	88	51	121
4-Bromofluorobenzene	94	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.1
Chloroethane	<1
1,1-Dichloroethene	<0.1
Methylene chloride	<1
trans-1,2-Dichloroethene	<0.1
1,1-Dichloroethane	<0.1
cis-1,2-Dichloroethene	<0.1
1,2-Dichloroethane (EDC)	<0.1
1,1,1-Trichloroethane	<0.1
Trichloroethene	<0.06
Tetrachloroethene	0.25

Note: Detection limits are raised due to an insufficient amount of sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-3-1.5	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-06
Date Analyzed:	07/05/07	Data File:	070518.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	88	56	118
1,2-Dichloroethane-d4	79	59	116
Toluene-d8	88	51	121
4-Bromofluorobenzene	94	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.1
Chloroethane	<1
1,1-Dichloroethene	<0.1
Methylene chloride	<1
trans-1,2-Dichloroethene	<0.1
1,1-Dichloroethane	<0.1
cis-1,2-Dichloroethene	<0.1
1,2-Dichloroethane (EDC)	<0.1
1,1,1-Trichloroethane	<0.1
Trichloroethene	<0.06
Tetrachloroethene	0.11

Note: Detection limits are raised due to an insufficient amount of sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	HB-4-1	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	707025-07
Date Analyzed:	07/05/07	Data File:	070519.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	92	56	118
1,2-Dichloroethane-d4	85	59	116
Toluene-d8	87	51	121
4-Bromofluorobenzene	95	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.06
Chloroethane	<0.6
1,1-Dichloroethene	<0.06
Methylene chloride	<0.6
trans-1,2-Dichloroethene	<0.06
1,1-Dichloroethane	<0.06
cis-1,2-Dichloroethene	<0.06
1,2-Dichloroethane (EDC)	<0.06
1,1,1-Trichloroethane	<0.06
Trichloroethene	<0.04
Tetrachloroethene	<0.06

Note: Detection limits are raised due to an insufficient amount of sample.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Environmental Associates, Inc.
Date Received:	Not Applicable	Project:	Overlake Cleaners /JN-27200
Date Extracted:	07/03/07	Lab ID:	07-977 mb
Date Analyzed:	07/03/07	Data File:	070312.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	81	56	118
1,2-Dichloroethane-d4	78	59	116
Toluene-d8	81	51	121
4-Bromofluorobenzene	88	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/10/07
Date Received: 07/02/07
Project: Overlake Cleaners /JN-27200, F&BI 707025

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 707026-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	mg/kg (ppm)	<0.05	<0.05	nm
Chloroethane	mg/kg (ppm)	<0.05	<0.05	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
cis-1,2-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	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
Trichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
Tetrachloroethene	mg/kg (ppm)	0.1	0.1	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	mg/kg (ppm)	2.5	121	116	22-139	4
Chloroethane	mg/kg (ppm)	2.5	112	116	38-142	3
1,1-Dichloroethene	mg/kg (ppm)	2.5	112	109	46-131	3
Methylene chloride	mg/kg (ppm)	2.5	101	97	46-131	5
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	110	104	67-120	6
1,1-Dichloroethane	mg/kg (ppm)	2.5	121 vo	119 vo	77-117	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	107	105	75-122	2
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	133 vo	133 vo	74-122	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	100	97	74-125	2
Trichloroethene	mg/kg (ppm)	2.5	105	103	81-124	3
Tetrachloroethene	mg/kg (ppm)	2.5	100	97	79-127	3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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 - The sample was diluted due to insufficient sample volume. Detection limits are raised due to dilution

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.

707025

SAMPLE CHAIN OF CUSTODY

ME 7-2-07 CI2/VS1

Page # 1 of 1

Send Report To Chris Cass

Company Environmental Associates, Inc.

Address 1380-112th Ave NE, Suite 300

City, State, ZIP Bellevue WA 98

Phone # 425-455-9025 Fax # 425-455-2316

SAMPLERS (signature) Chris Cass

PROJECT NAME/NO. (Redmond) Overlake Cleaners JN-27200

PO #

REMARKS
Send additional copy of report in "EIM" Electronic format

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 (A-C)	Date Sampled	Time Sampled	Sample Type	# of containers	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	Chlorinated VOCs by 8260						Notes
HB-1-1	01	6-29-07	10:30	Soil	3							X						
HB-1-2.5	02		11:00		3							X						
HB-2-0.5	03		12:00		3							X						
HB-2-2	04		12:30		3							X						
HB-3-0.5	05		1:00		3							X						
HB-3-1.5	06		1:30		3							X						
HB-4-1	07		2:30		3							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: Chris Cass	Chris Cass	EAI	7-2-07	13:45
Received by: [signature]	[signature]	R&B	7/2/07	15:45
Relinquished by:				
Received by:		Samples received at 10 °C		

FORMS\COC\COC.DOC

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

July 10, 2007

Chris Cass, Project Manager
Environmental Associates, Inc.
1380 112th Ave. NE, #300
Bellevue, WA 98004

Dear Mr. Cass:

Included are the results from the testing of material submitted on July 2, 2007 from the Overlake Cleaners/JN-27200, F&BI 707026 project. There are 16 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
EAI0710R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-1-4	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-01
Date Analyzed:	07/03/07	Data File:	070306.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	83	56	118
1,2-Dichloroethane-d4	84	59	116
Toluene-d8	85	51	121
4-Bromofluorobenzene	89	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	0.1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-1-21	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-06
Date Analyzed:	07/03/07	Data File:	070308.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	84	56	118
1,2-Dichloroethane-d4	86	59	116
Toluene-d8	88	51	121
4-Bromofluorobenzene	90	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-1-GW	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-07
Date Analyzed:	07/03/07	Data File:	070307.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	105	75	125
1,2-Dichloroethane-d4	109	67	133
Toluene-d8	112	79	129
4-Bromofluorobenzene	122	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-2-1	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-08
Date Analyzed:	07/03/07	Data File:	070309.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	82	56	118
1,2-Dichloroethane-d4	81	59	116
Toluene-d8	81	51	121
4-Bromofluorobenzene	90	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-2-12	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-11
Date Analyzed:	07/03/07	Data File:	070310.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	80	56	118
1,2-Dichloroethane-d4	77	59	116
Toluene-d8	81	51	121
4-Bromofluorobenzene	89	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	0.07

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-3-4	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-12
Date Analyzed:	07/03/07	Data File:	070311.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	80	56	118
1,2-Dichloroethane-d4	79	59	116
Toluene-d8	82	51	121
4-Bromofluorobenzene	85	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-3-12	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-14
Date Analyzed:	07/05/07	Data File:	070508.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	89	56	118
1,2-Dichloroethane-d4	85	59	116
Toluene-d8	88	51	121
4-Bromofluorobenzene	93	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-4-1	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-15
Date Analyzed:	07/05/07	Data File:	070509.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	85	56	118
1,2-Dichloroethane-d4	84	59	116
Toluene-d8	87	51	121
4-Bromofluorobenzene	95	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-4-12	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-18
Date Analyzed:	07/05/07	Data File:	070510.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	84	56	118
1,2-Dichloroethane-d4	79	59	116
Toluene-d8	83	51	121
4-Bromofluorobenzene	94	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-5-4	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-19
Date Analyzed:	07/05/07	Data File:	070511.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	84	56	118
1,2-Dichloroethane-d4	86	59	116
Toluene-d8	90	51	121
4-Bromofluorobenzene	93	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	SB-5-8	Client:	Environmental Associates, Inc.
Date Received:	07/02/07	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	707026-20
Date Analyzed:	07/05/07	Data File:	070512.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	82	56	118
1,2-Dichloroethane-d4	79	59	116
Toluene-d8	86	51	121
4-Bromofluorobenzene	93	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Environmental Associates, Inc.
Date Received:	Not Applicable	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	07-972 mb
Date Analyzed:	07/03/07	Data File:	070306.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	102	75	125
1,2-Dichloroethane-d4	109	67	133
Toluene-d8	111	79	129
4-Bromofluorobenzene	123	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Environmental Associates, Inc.
Date Received:	Not Applicable	Project:	Overlake Cleaners/JN-27200
Date Extracted:	07/03/07	Lab ID:	07-977 mb
Date Analyzed:	07/03/07	Data File:	070312.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	81	56	118
1,2-Dichloroethane-d4	78	59	116
Toluene-d8	81	51	121
4-Bromofluorobenzene	88	32	146

Compounds:	Concentration mg/kg (ppm)
Vinyl chloride	<0.05
Chloroethane	<0.5
1,1-Dichloroethene	<0.05
Methylene chloride	<0.5
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
cis-1,2-Dichloroethene	<0.05
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
Trichloroethene	<0.03
Tetrachloroethene	<0.05

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/10/07
Date Received: 07/02/07
Project: Overlake Cleaners/JN-27200, F&BI 707026

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 707026-07 (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
Trichloroethene	ug/L (ppb)	<1	<1	nm
Tetrachloroethene	ug/L (ppb)	<1	<1	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	ug/L (ppb)	50	96	103	45-168	7
Chloroethane	ug/L (ppb)	50	88	95	28-161	8
1,1-Dichloroethene	ug/L (ppb)	50	96	96	48-136	0
Methylene chloride	ug/L (ppb)	50	92	93	70-110	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	101	98	78-121	3
1,1-Dichloroethane	ug/L (ppb)	50	97	96	75-121	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	99	98	79-125	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	96	96	71-123	0
1,1,1-Trichloroethane	ug/L (ppb)	50	100	99	78-124	1
Trichloroethene	ug/L (ppb)	50	98	94	74-119	4
Tetrachloroethene	ug/L (ppb)	50	99	95	79-117	5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/10/07
Date Received: 07/02/07
Project: Overlake Cleaners/JN-27200, F&BI 707026

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260B

Laboratory Code: 707026-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference (Limit 20)
Vinyl chloride	mg/kg (ppm)	<0.05	<0.05	nm
Chloroethane	mg/kg (ppm)	<0.05	<0.05	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
cis-1,2-Dichloroethene	mg/kg (ppm)	<0.05	<0.05	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
Trichloroethene	mg/kg (ppm)	<0.05	<0.05	nm
Tetrachloroethene	mg/kg (ppm)	0.1	0.1	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Vinyl chloride	mg/kg (ppm)	2.5	121	116	22-139	4
Chloroethane	mg/kg (ppm)	2.5	112	116	38-142	3
1,1-Dichloroethene	mg/kg (ppm)	2.5	112	109	46-131	3
Methylene chloride	mg/kg (ppm)	2.5	101	97	46-131	5
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	110	104	67-120	6
1,1-Dichloroethane	mg/kg (ppm)	2.5	121 vo	119 vo	77-117	2
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	107	105	75-122	2
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	133 vo	133 vo	74-122	0
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	100	97	74-125	2
Trichloroethene	mg/kg (ppm)	2.5	105	103	81-124	3
Tetrachloroethene	mg/kg (ppm)	2.5	100	97	79-127	3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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 - The sample was diluted due to insufficient sample volume. Detection limits are raised due to dilution

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.

707026

SAMPLE CHAIN OF CUSTODY

ME 7.2.07 CI2/V1/VS1

Page # 1 of 2

Send Report To Chris Cass
Company Environmental Associates Inc
Address 1380-112th Ave NE, S-300
City, State, ZIP Bellevue, WA 98004
Phone # 425-455-9025 Fax # 425-455-2316
info@environmentalassociatesinc.com

SAMPLERS (signature) Chris Cass

PROJECT NAME/NO. Overlake Cleaners JN-27200

PO #

REMARKS
send copy of report in "EIM" format

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	Chlorinated VOCs 8260						Notes
SB-1-4	01 A-C	7-2-07	9:20	Soil	3							X						
SB-1-8	02 A-C		9:25		3													
SB-1-12	03 A-C		9:30		3													
SB-1-15	04 A-C		10:40		3													
SB-1-18	05 A-C		10:45		3													
SB-1-21	06		10:50		1							X						
SB-1-GW	07 A-C		10:55	Water	3							X						*
SB-2-1	08 A-C		11:25	Soil	3							X						
SB-2-4	09		11:26		1													
SB-2-5	10		11:30		1													

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Chris Cass	Chris Cass	EAI	7-2-07	13:45
Received by: [illegible]	[illegible]	F&B	7/2/07	1345
Relinquished by:				
Received by:		Samples received at 5 °C		

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

707026

SAMPLE CHAIN OF CUSTODY

ME 7.2.07 <I2/V1/US1

Page # 2 of 2

Send Report To: Chris Cass
Company: Environmental Associates, Inc.
Address:
City, State, ZIP: Same as page 1
Phone #: Fax #:

SAMPLERS (signature): Chris Cass
PROJECT NAME/NO.: Overlake Cleaners
PO #:

REMARKS: Send a copy of lab report in "EDM" format

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	Chlorinated VOCs 8260						Notes
SB-2-12	11	7-2-07	11:35	Soil	1							X						
SB-3-4	12		11:45		1							X						
SB-3-8	13		11:50		1													
SB-3-12	14		11:55		1							X						
SB-4-1	15 A-C		12:05		3							X						
SB-4-4	16		12:06		1													
SB-4-8	17		12:10		1													
SB-4-12	18		12:15		1							X						
SB-5-4	19		12:30		1							X						
SB-5-8	20		12:35		1							X						

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Chris Cass	Chris Cass	EAI	7-2-07	13:45
Received by:	[illegible]	Young	FEB	7/2/07	13:45
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

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DRAFT

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-1	Client:	Environmental Associates, Inc.
Date Received:	07/05/07	Project:	Overlake Cleaners/
Date Extracted:	01/10/07	Lab ID:	707046-01
Date Analyzed:	07/10/07	Data File:	071010.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	104	75	125
1,2-Dichloroethane-d4	110	67	133
Toluene-d8	107	79	129
4-Bromofluorobenzene	114	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	MW-2	Client:	Environmental Associates, Inc.
Date Received:	07/05/07	Project:	Overlake Cleaners/
Date Extracted:	01/10/07	Lab ID:	707046-02
Date Analyzed:	07/10/07	Data File:	071010A.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	104	75	125
1,2-Dichloroethane-d4	108	67	133
Toluene-d8	107	79	129
4-Bromofluorobenzene	113	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Environmental Associates, Inc.
Date Received:	Not Applicable	Project:	Overlake Cleaners
Date Extracted:	07/10/07	Lab ID:	071008 mb
Date Analyzed:	07/10/07	Data File:	071005.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	99	75	125
1,2-Dichloroethane-d4	107	67	133
Toluene-d8	107	79	129
4-Bromofluorobenzene	117	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

SAMPLE CHAIN OF CUSTODY

Send Report To: Chris Cass
Company: Environmental Associates, Inc.
Address: [illegible] 10th Ave NE, Suite 500
City, State, ZIP: Bellevue, WA 98004
Phone #: [illegible] Fax #: [illegible]

SAMPLERS (signature): [illegible]

PROJECT NAME/NO.: Overlake Cleaners / DN-27200

PO #:

REMARKS: Send copy of report in "EI" format

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

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	Chlorinated VOCs 8260						Notes
MW-1		7-[illegible]	[illegible]	Water	3							X						
MW-2		7-[illegible]	4:45	Water	3							X						

ANALYSES REQUESTED

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	[illegible]	Chris Cass	EAI	7-[illegible]	[illegible]:28
Received by:					
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

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DRAFT

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Well Purge Water	Client:	Environmental Associates, Inc.
Date Received:	07/05/07	Project:	Overlake Cleaners
Date Extracted:	07/10/07	Lab ID:	707047-01
Date Analyzed:	07/10/07	Data File:	071018.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	102	75	125
1,2-Dichloroethane-d4	107	67	133
Toluene-d8	107	79	129
4-Bromofluorobenzene	113	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

Analysis For Volatile Compounds By EPA Method 8260B

Client Sample ID:	Method Blank	Client:	Environmental Associates, Inc.
Date Received:	Not Applicable	Project:	Overlake Cleaners/
Date Extracted:	07/10/07	Lab ID:	071008 mb
Date Analyzed:	07/10/07	Data File:	071005.D
Matrix:	Water	Instrument:	GCMS5
Units:	ug/L (ppb)	Operator:	MB

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Dibromofluoromethane	99	75	125
1,2-Dichloroethane-d4	107	67	133
Toluene-d8	107	79	129
4-Bromofluorobenzene	117	76	145

Compounds:	Concentration ug/L (ppb)
Vinyl chloride	<0.2 j
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

SAMPLE CHAIN OF CUSTODY

Send Report To Chris Cass

Company Environmental Associates, Inc

Address [illegible] Ave NE Suite 300

City, State, ZIP [illegible] WA 98604

Phone # [illegible] Fax # 425-455-2316

SAMPLERS (signature) [illegible]

PROJECT NAME/NO. [illegible] Cleaners / [illegible] 27200

PO # [illegible]

REMARKS

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

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	Chlorinated VOCs	8260					Notes
[illegible] water		7-5-07	9:45	Water	[illegible]							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: [illegible]	Chris Cass	E[illegible]	7-5-07	10:28
Received by:	[illegible]	[illegible]		
Relinquished by:				
Received by:				

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APPENDIX -C

Copies of Select Documents Prepared by Others in 1996/1997

DEPARTMENT OF ECOLOGY
ENVIRONMENTAL REPORT TRACKING SYSTEM
INCIDENT HISTORY

ALLEGED DATA

==========

COORDINATOR: KLOCKE, KAREN

REPORT 1 OF 1

DATE/TIME REC'D: 09/27/1996 11:15 AM
ACTUAL DATE: 09/27/1996

REPORT TYPE: INITIAL

CALLER NAME: FIX, TOM
CITY OF REDMOND
ADDRESS: 18080 NE 76TH ST

REMOND WA 98052
PHONE: W 556-2847 EXT: TYPE: NORMAL

ANONYMOUS?:

COUNTY: KING CITY: REDMOND
WATERWAY: GROUND WATER WELLS 1 AND 2 TYPE: GROUND WATER

LOCATION INFO: REDMOND MUNICPAL WELLS 1 AND 2 IN ANDERSON PARK HAVE BEEN PICKING UP TETRA-CHLORETHYLENE (PERK) A DRYCLEANING SOLVENT IN MUNICIPAL WELLING PUMPAGE SINCE AUGUST 1996. LEVELS ARE CURRENTLY AROUND 3.5 PPB. THERE IS A SUSPECTED SOURCE DRY CLEANERS (OVERLAKE) DIRECTLY ACROSS 79TH STREET FROM THE WELL HOUSES IN PARK.

MEDIUM: GROUND WATER
MATERIAL: CHEMICAL QTY: UNIT: HAZARDOUS: Y

CAUSE: UNKNOWN
IMPACT: GROUND WATER CONTAMINATION
SOURCE: COMMERCIAL ACTIVITY: UNKNOWN

ALLEGED VIOLATOR 1: SUSPECT -- OVERLAKE DRY CLEANERS
UNKNOWN
ADDRESS: 79TH

REDMOND WA

CONTACT 1: TOM FIX
PHONE: 556-2847 EXT: TYPE: NORMAL

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Northwest Regional Office, 3190 - 160th Ave S.E. • Bellevue, Washington 98008-5452 • (206) 649-7000

November 12, 1996

Mr. David Lee
14426 NE 16th Place
Bellevue, WA 98007

Subject: Initial Investigation Results and Follow-up Information for Anderson Park area including Overlake Cleaners at 16940 NE 79th St, Redmond, Washington

Dear Mr. Lee:

This letter is to pass on the laboratory results from the Initial Investigation at and around Anderson Park including the Overlake Cleaners and to provide information for you. The Initial Investigation included sampling at Anderson Park, at the cleaners, and nearby streets and properties on October 10, 1996. The sampling included soil sampling, sampling the nearby stormwater drainage catch basins, and at the dry cleaners soil and water sampling at the water cooling system. A summary of the sampling results and the laboratory data sheets are attached.

At Overlake Cleaners, soil and water sampling (sample numbers #96418110 through 96418115d) showed elevated levels of tetrachloroethene (PCE) and trichloroethene (TCE). The soil sample results showed levels above the state Model Toxics Control Act method A cleanup levels also listed on table 2. These results lead us to suspect that contamination may be present at the dry cleaners site and to issue the "Early Notice Letter."

Now, to give you some information to assist in understanding the state cleanup process and your rights and responsibilities. Enclosed is a 6-page summary on "Hazardous waste considerations in real estate transactions." This summary will give you an overview of hazardous contamination at a site and the environmental laws and potential liabilities. The one-page Focus sheet on property purchases and liability for contamination follows up with issues about liability for contamination.

In order to estimate the presence and extent of contamination, you may wish to read the 4-page summary on "Toxics Information: Cleaning up Hazardous waste sites: cleanup standards and cleanup actions." This summary (printed on orange paper in the front of the green book) outlines cleanup requirements and how to set cleanup levels. The green book is a copy of the Model Toxics Control Act, the state regulations that govern cleanup at sites within Washington state.

Your first step may be to hire a consultant and I have enclosed information on how to hire one. A consultant would help you to decide what needed to be looked at, the PCE and TCE, how to cleanup the site and remediate the contamination, or dispose of the contaminated soils that you may find. The consultant would also be able to document that the remaining site was clean. Enclosed is "Selecting an Environmental Consulting Firm." We do not currently have a list of consulting firms that do this type of work in the State of Washington. I would suggest that you call several to find one that you would like to have do the work on your site. There are many listed in the Yellow Pages of the telephone book.

To help in understanding what needs to be done on the property, I am sending a Focus Sheet on State Review of Independent Cleanups and the "Guidance for Preparing Independent Remedial Action Reports." This information is helpful in dealing with contamination in soil

The green-covered Model Toxics Control Act Cleanup Regulation is the regulation which covers issues of contaminated soil and water. The first ten pages are helpful in understanding the regulation. The rest of it, like most laws, is more technical and difficult to read. This is information which your consultant needs to understand.

Once your site cleanup is complete, your consultant will have to document the cleanup in an Independent Cleanup Report that will be submitted to the Department of Ecology. The information I have enclosed about the review of Independent Cleanup Reports may be helpful in putting together the report, as it indicates the type of site information that Ecology would need to assess the cleanup work. Even if you choose not to participate in the voluntary Independent Remedial Action Program (IRAP), the guidelines presented in these pages may assist you and your consultant in deciding on what sort of work needs to be done on the site and how that work will need to be reported.

I hope that this material will be helpful to you in deciding what steps you wish to take. I realize that there is a significant amount of information for you to review, especially if you have not been involved with a site assessment or cleanup in the past. We offer a one hour consultation to parties involved in cleanups such as yours and if you would like to arrange such a meeting.

If you have any questions or would like to arrange a meeting, please feel free to call me at 206-649-7249.

Sincerely,

Maura S. O'Brien,
Toxics Cleanup Program

Enclosures

cc Mr Philip Cohen, PE, City of Redmond
w/o enclosures

WASHINGTON STATE DEPARTMENT OF ECOLOGY
NORTHWEST REGIONAL OFFICE

To Philip Cohen, PE, City of Redmond Public Works Department
From Maura S. O'Brien, NWRO TCP Site Management Unit
Subject Anderson Park and Vicinity Sampling Results as part of an Initial Investigation under the Model Toxics Control Act, Redmond, Washington
Date November 6, 1996

Attached are the sampling results from the Initial Investigation (II) conducted at Anderson Park and the surrounding vicinity on October 10, 1996. This investigation was prompted by elevated levels of tetrachloroethene (perchloroethene or PCE) identified in the water supply well #SO-1 located at Anderson Park.

The investigation included a site walk and visual inspection of the location of the two water supply wells in Anderson Park and the park, the Overlake Dry Cleaners (northeast of the park), neighboring properties, a location of a former vehicle maintenance facility now an apartment building (half a block north of the park), and city streets and stormwater catch basins. A GPS reading for latitude and longitude, sampling and photographs were taken.

Sampling for the II included nine soil samples, one lint sample, and two water samples as listed on Table 1. Soil samples were collected as grab samples at the park, neighboring dry cleaners, and from sediment traps in selected stormwater catch basins at the park, dry cleaners, site of a former vehicle maintenance facility, and surrounding streets. The lint sample was collected from dust and lint particles from the outside vent for the dry cleaner's exhaust fan located on the north side of the building adjacent to the dry cleaning Fluormatic machine. The water samples were collected from a discharge pipe for the water cooling system separate and part of the dry cleaning system located outside at the rear of the building.

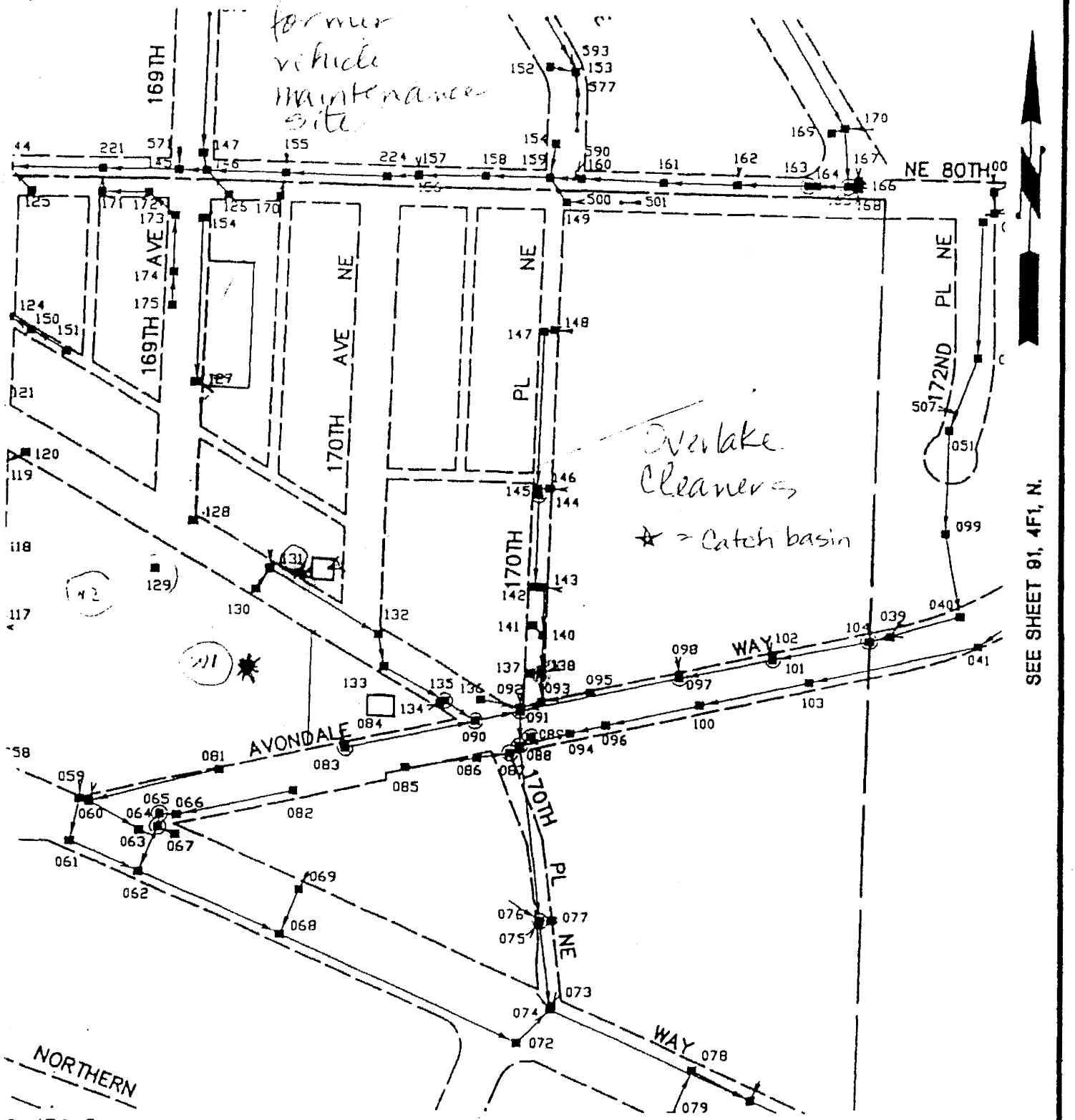
Samples were analyzed by Manchester Environmental Laboratory for volatile organic substances using a modification of the EPA method 8260. The laboratory results were reviewed using normal QA/QC procedures and the laboratory sheets are attached as Appendix A.

Sample results for selected volatiles are summarized on Table 2 for tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichloroethane (1,2-DCA), methylene chloride and other substances; and on Table 3 for benzene, ethylbenzene, toluene, xylene, and other substances. Bold type shows that a detection was identified above the practical quantification level. And the Model Toxics Control Act method A cleanup levels are listed for reference.

The results show that three samples exceeded the MTCA method A cleanup levels for PCE. Further investigation is needed to assess the presence and possible extent of contamination.

Ecology has issued an Early Notice Letter to Overlake Cleaners notifying the owner and operator of the known or suspected contamination at the site.

Questions: please call me at the Northwest Regional Office at 206-649-7249.



NW 1/4 SEC. 12, T. 25 N., R. 5 E.

SCALE : 1" = 200'
DATE PLOTTED : 3/9/94
DRAWINGS INSERTED : DU, P, SV

NORTH HALF **4F4** GRID SECTION

SHT. 95 OF 131

Anderson Park and Vicinity Selected Soil and Water Discharge Sampling for Initial Investigation

Table 1 - Sample Location Description for Selected Soil, Catch Basin and Water Discharge Samples
Collected October 10, 1996 for Initial Investigation under the Model Toxics Control Act.

Field Id	Lab Id		Description
Soil Samples, ug/kg			
AP-catch basin SO-1E	96418105		Unnumbered stormwater catch basin, east of Anderson Park water supply well #SO-1
AP-soil SO-1E	96418116		Soil sample collected 12 inch depth, northeast of Anerson Park water supply well #SO-1.
Catch basin-private	96418106		Unnumbered stormwater catch basin, west of Overlake Dry Cleaners.
Catch basin-131	96418107		City stormwater catch basin #131, located 16900s block of NE 79th St,
Catch basin-131 diltn	96418107d		as above /in front and west of Overlake Dry Cleaners.
Catch basin-138	96418108		City stormwater catch basin #138, located 7900s block of 170th Pl NE,
Catch basin-138 diltn	96418108d		as above /one block east of Overlake Dry Cleaners.
Catch basin-127	96418109		City stormwater catch basin #127, 7900s block of 169th Av NE, former vehicle maintenance
Dry cleaners-fan lint	96418110		Overlake Dry Cleaners exhaust fan lint, located at 16940 NE 79th St.
Dry cleaners-F. soil	96418111		Overlake Cleaners soil collected at 12 inch depth below fan location.
Dry cleaners-F. soil diltn	96418111d		as above
Dry cleaners-S. soil	96418112		Overlake Cleaners soil collected 3-6 inch depth below building, dry cleaning machine and slab
Dry cleaners-S. soil diltn	96418112d		as above
Dry cleaners-watsep soil	96418115		Overlake Cleaners soil collected 3-6 inch depth below water cooling discharge pipe
Dry cleaners-watsep soil diltn	96418115d		as above
Water Samples, ug/L			
Dry cleaners-water #a	96418113		Overlake Cleaners water sample from dry cleaning water cooling discharge pipe.
Dry cleaners-water #b	96418114		as above

Anderson Park and Vicinity Selected Soil and Water Discharge Sampling for Initial Investigation

Table 2 - Tetrachlorethene (PCE) and Selected Substances Results

Field Id	Lab Id	PCE	*	TCE	*	1,2-DCA	*	Meth Chloride	*	Other Substances**
Soil Samples, ug/kg (ppb)										
AP-catch basin SO-1E	96418105	3.5		3.3	U	3.3	U	1.2	J	a
AP-soil SO-1E	96418116	1.4	J	1.5	U	0.9	J	6.2	J	
Catch basin-private	96418106	4.4		3.4	U	3.4	U	6.2	J	
Catch basin-131	96418107	0.7	J	1.4	U	1.4	U	3.4		b
Catch basin-131 dilution	96418107d	0.6	J	3.5	U	3.5	U	4	UJ	c
Catch basin-138	96418108	5.2	U	5.2	U	5.2	U	31		d
Catch basin-138 dilution	96418108d	13	U	13	U	13	U	18	UJ	e
Catch basin-127	96418109	1.2	U	1.2	U	1.2	U	5.5		f
Dry cleaners-fan lint	96418110	1220	E	26		18	U	51		g
Dry cleaners-F. soil	96418111	185	E	2.5	U	2.5	U	5	U	
Dry cleaners-F. soil dilution	96418111d	50		9.5	U	9.5	U	14	UJ	h
Dry cleaners-S. soil	96418112	898	E	0.46	J	1.9	U	3.8	U	i
Dry cleaners-S. soil dilution	96418112d	977	E	14	U	14	U	18	UJ	j
Dry cleaners-watsep soil	96418115	396	E	0.26	J	1.5	U	4		
Dry cleaners-watsep soil diltn	96418115d	182		5.5	U	5.5	U	9	UJ	k
MTCA Method A Soil Cleanup Levels, ug/kg (ppb)										
Method A		500		500		not specified		500		
Water Samples, ug/L										
Dry cleaners-water #a	96418113	2.9		1	U	1	U	1	U	
Dry cleaners-water #b	96418114	1.2		1	U	1	U	1	U	l
MTCA Method A Ground Water Cleanup Levels, ug/L										
Method A		5		5		5		5		

*Laboratory qualification where U is undetected at the specified level;

J is the substance was positively identified and the specified level is an estimate;

E is the substance was positively identified and the associated value exceeded the calibration range.

**Other Substances, see laboratory data sheets.

Anderson Park and Vicinity Selected Soil and Water Discharge Sampling for Initial Investigation

Table 3 - BETX Results

Field Id	Lab Id	Benzene	*	E Benzene	*	Toluene	*	Xylene	*	p-Isopropyltoluene	*	Other Substnces**
Soil Samples, ug/kg (ppb)												
AP-catch basin SO-1E	96418105	3.3	U	3.3	U	3.1		6.6	U	5.5	J	a
AP-soil SO-1E	96418116	1.5	U	1.5	U	1.5	UJ	3	U	3	U	
Catch basin-private	96418106	1	UJ	3.4	U	1.5	UJ	6.8	U	5.1	J	b
Catch basin-131	96418107	1.4	U	6.1		3.1		0.29	J	203	E	c
Catch basin-131 dilution	96418107d	3.5	U	3.6		6.9		1	UJ	76		d
Catch basin-138	96418108	3	UJ	226	E	12		6.8	J	94	J	e
Catch basin-138 dilution	96418108d	13	U	19		6	UJ	3.3	J	199	J	f
Catch basin-127	96418109	1.2	UJ	0.53	J	2	UJ	2.4	U	2.1	J	g
Dry cleaners-fan lint	96418110	18	U	18	U	7	UJ	36	U	12	J	
Dry cleaners-F. soil	96418111	2.5	U	2.5	U	2.5	UJ	5	U	5	U	h
Dry cleaners-F. soil dilution	96418111d	2.7	J	9.5	U	3	U	19	U	19	U	i
Dry cleaners-S. soil	96418112	1.9	U	1.9	U	2	UJ	3.8	U	3.8	U	j
Dry cleaners-S. soil dilution	96418112d	14	U	14	U	14	U	27	U	27	U	
Dry cleaners-watsep soil	96418115	1.5	UJ	1.5	U	1.5	U	3	U	3	U	k
Dry cleaners-watsep soil diltn	96418115d	1.1	J	5.5	U	2	UJ	11	U	11	U	
MTCA Method A Soil Cleanup Levels, ug/kg (ppb)												
Method A		500		20,000		40,000		20,000		not specified		
Water Samples, ug/L (ppb)												
Dry cleaners-water #a	96418113	1	U	1	U	1	U	2	U	1	U	
Dry cleaners-water #b	96418114	1	U	1	U	0.15	J	2	U	1	U	
MTCA Method A Ground Water Cleanup Levels, ug/L (ppb)												
Method A		5		30		40		20		not specified		

*Laboratory qualification where U is undetected at the specified level;
J is the substance was positively identified and the specified level is an estimate;
E is the substance was positively identified and the associated value exceeded the calibration range.
**Other Substances, see laboratory data sheets.

STOEL RIVES LLP
ATTORNEYS
ONE UNION SQUARE
600 UNIVERSITY STREET, SUITE 3600
SEATTLE, WASHINGTON 98101-3197
Internet: www.stoel.com

RECEIVED
SEP 26 1997
DEPT OF ECOLOGY

September 24, 1997

RICHARD A. DU BEY
Direct Dial
(206) 386-7595
email radubey@stoel.com

Mura S. O'Brien
Toxics Cleanup Program
Department of Ecology
Northwest Regional Office
3190 - 160th Avenue SE
Bellevue, WA 98008-5452

Re: Overlake Cleaners Groundwater Monitoring Wells

Dear Ms. O'Brien:

As I informed you this afternoon, we represent Overlake Cleaners with regard to environmental matters associated with the Overlake Cleaners facility located at 16940 NE 79th Street, Redmond, Washington. On November 6, 1996 the Department of Ecology (Ecology) issued an early notice letter (No. N-17-5420-000) to David and Young Lee with regard to the presence of certain contamination at this property.

During the course of our conversation, you indicated you had recently sent, by regular mail, a letter to David and Young Lee, requesting that they provide you with the results of the recent groundwater monitoring investigation funded by the Lees at the Overlake Cleaners property in Redmond, Washington. This response, made on behalf of Overlake Cleaners and the Lees, provides you with a copy of the groundwater monitoring data from the two wells (MW1 and MW2) placed at the Overlake Cleaners property in Redmond, Washington. In addition to the groundwater monitoring data, also enclosed are: copies of the subsurface exploration logs; the chain of custody record; a draft table summarizing the results prepared by ENSR; and two figures

which show the location of the groundwater monitoring wells, elevation of the wells and the groundwater sampling results.

Overlake Cleaners have voluntarily provided this information to Ecology as further evidence of Overlake Cleaners' continuing effort to cooperative with Ecology and the City of Redmond in furthering the City's investigation of groundwater contamination at the City of Redmond Anderson Park well system. It is my understanding that you have already received comparable information regarding groundwater samples taken from the City of Redmond groundwater monitoring well (No. 3), which is located down gradient from MW1 and MW2.

As I mentioned during our conversation, Overlake Cleaners was pleased to observe that the sample results from MW2, the well closest to the Anderson Park wells, tested clean and no PCE, methylene chloride or chloromethane was detected. Moreover, the groundwater gradient, as evidenced by the elevations taken from three wells, appears to be north/northwest. I look forward to our discussions regarding this matter. Please let me know whether you intend to prepare an agenda for this meeting. If so, please include a discussion of the November 6, 1996 Site Data Summary Sheet prepared for the Overlake Cleaners and, in particular, the initial evaluation of the property regarding affected media and contaminants of concern.

Again, thanks for taking the time to talk to me this afternoon. Please feel free to call if you have any questions.

Sincerely,

Richard A. Du Bey

RAD:cfz
Enclosures
cc: Overlake Cleaners, Inc.
Jim Wilders, ENSR

MEMORANDUM

DATE: June 07, 2007

FROM: Jake S. Lee, Ph.D.

TO: Mr. David Lee

PROJECT: 02070320-1

TOTAL PAGES following cover page: 5

If you have difficulty receiving this information, please contact us at 425-890-3517.

SUBJECT: Proposal - Site Characterization
Overlake Cleaners
16940 NE 79th Street, Redmond, WA98052

If the scope of work and fee schedule seems appropriate, please sign and fax back the last page of the proposal with so that we may begin working on this project as soon as possible. A hard copy is will be sent by mail upon your request.

Should you have any question, please feel free to contact us at 425-890-3517.

Thank you.

Jake S. Lee, Ph.D.

President
Envitech, llc.
9528 226th PL NE
Redmond WA 98053

Registered Washington State Environmental Site Assessor (#5264460-U7)

June 07, 2007
Project 02070320-1

Mr. David Lee
Overlake Cleaners

PROPOSAL: **Site Characterization**
Overlake Cleaners
16940 NE 70th Street, Redmond WA 98052

Dear Mr. David Lee:

In response to your recent request, we are pleased to forward this proposal to provide environmental consulting services for the above-referenced property.

STATEMENT OF UNDERSTANDING

During our conversation on March 19, we discovered that a dry cleaning establishment identified as Overlake Cleaners was impacted by tetrachloroethene (PCE) in levels above the applicable or relevant and appropriate requirement. The Washington State Department of Ecology (WSDOE) method A cleanup standard is 0.05 mg of PCE/mg of soil.

You have advised us that it is your interest to have Envitech, llc. conduct site characterization including sampling and testing for the presence of halogenated dry cleaning solvents in an effort to evaluate the vertical and horizontal extent of chemically impacted soil and groundwater.

In accordance with this proposal, Envitech, llc. will provide the necessary technical expertise and laboratory services, and other services that may be required to address this objective.

The following paragraphs provide a brief discussion of the various technical tasks proposed to address your interests.

Task 1 Soil Borings

Under Task 1, Envitech proposes to advance about ten (10) soil borings to evaluate extent of chemical impact from the dry cleaning spot to the east, west, south, and north of the subject property. About four soil borings around the source area beneath the dry cleaning machine will be advanced up to a depth of 20 feet below ground surface (bgs) or until encountering boring refusal. The remaining borings will go to depths of approximately 8 to 12 feet each below the ground surface within accessible interior of the on-site dry cleaner. Four additional borings will be advanced outside each corner of the dry cleaning building.

The purpose of these borings is to attempt to evaluate the lateral and vertical extent and nature of contamination from the dry cleaning operation.

Exact boring locations will be selected by the project geologist based upon observed site conditions such as proximity to on-site obstruction (building overhead obstruction, utility piping, etc.) which may limit accessibility.

Task 2 Soil Sampling

The undisturbed soil samples in 4-feet intervals and one groundwater sample (if encountered) from each boring will be collected. Collected samples will be selected for laboratory analysis based on such factors noted during probing and sampling as odors, soil discoloration, headspace testing, stratigraphy, proximity to groundwater table, and on-site analysis by PID detector.

Soil samples obtained from the core sampler will be screened for volatile organic compounds (VOCs) using a miniRae Model 2000 photoionization detector (PID). Prior to use, the PID will be calibrated against a 100 parts per million (ppm) isobutylene span gas in air mixture. The instrument will be then zeroed against the ambient air near the work area. The PID is useful for qualitative field screening of VOCs and provides a basis for comparison between soil samples collected in the field. Soil samples will be placed into sealable plastic bags and allow to sit in a warm area for volatilization to occur. After approximately 5 minutes, VOCs will be field measured by placing the tip of the PID into the head space above each sample in each bag. This is not a compound-specific analysis and is affected by, among other influences, climate (e.g., temperature and humidity), soil type and conditions, instrument calibration and operation, and type of VOCs present.

All soil and groundwater (if encountered) samples will be transferred from the respective samplers directly to sterilized glassware with Teflon-sealed lids furnished by the project laboratory. Samples shall be stored in an iced chest at the site and taken to the lab in this condition to maximize excessive dissipation of volatile fraction hydrocarbons. Each container will be clearly labeled as to boring number, sample number, geologist, etc.

EPA-recommended 5035 sampling protocol for sample collection and management including maintenance of chain-of-custody documentation will be observed at each stage of the project.

During probing, a field log will be made by the project geologist for each boring. Information recorded versus corresponding depth shall include soil classification (Unified Soil Classification System), color, texture, moisture content, odor (if present), seepage zones (if present), etc. Groundwater (if encountered) samples will be collected at each boring location.

Task 3 Groundwater Sampling

Groundwater sample will be collected from two private groundwater well and one city well. The process of water sample collection will follow Envitech's written procedures, which were developed to meet the requirement of MTCA. The depth of well and the depth of water in the well will be measured to determine how much water is needed to be purged. The tree well volumes of water will be purged to remove any stagnant water in the well casing and to ensure that the most of the water sample originated from the aquifer formation being sampled.

The water sample will be collected from the hand bailer immediately after well purging. When an untreated one-liter bottle and two HCL-treated VOC glass containers will be immediately filled with water, they will be sealed, and then check for air bubbles to ensure that there was no container head space. The bottle will be labeled, a chain of custody form will be prepared and the sample will be transferred to a chilled cooler and ready for transport to analytical lab. To be analyzed for chlorinated aliphatic compounds.

Task 4 Laboratory Analysis

As noted earlier, Envitech intents to analyze soil and groundwater samples for the presence of halogenated dry cleaning solvents by EPA method 8260. If shallow groundwater is not encountered at each boring, a deeper soil sample may be substituted for analysis.

Selection of soil samples for laboratory analysis will be based upon actual subsurface conditions observed during probing (i.e., soil textures and relative densities, relative moisture content, soil discoloration, odors, organic vapor detector field measurements, etc.). "Surplus" samples will be cold archived at the project laboratory for a period of 30 days following completion of the report in the event that supplemental analyses are required.

During upon the result of the initial laboratory analysis and/or field observations, Envitech may recommend additional analysis or follow-up laboratory analysis. No additional analysis/cost will be incurred without the client's expressed authorization.

The analytical approach described above is intended to provide a basis for comparison of soil and groundwater (if encountered) quality at the site to guideline standards set by the Washington State Department of Ecology (WSDOE).

Task 5 Data Analysis, Report Preparation

Upon completion of all field and laboratory work, our professional licensed staff will analyze the data and prepare a brief written report summarizing approach, methods, and findings. Conclusions and recommendations will be couched in terms of prevailing regulations included but not necessarily limited to the Model Toxics Control Act (MTCA), Chapter 173-340 WAC.

ESTIMATED COSTS

The costs for conducting the sampling and testing work as outlined in this proposal would be on the order of $9,500.

PAYMENT TERM

Customer will pay Envitech, llc. as follows: 50% of the contract price shall be paid upon the initiation of project and the remaining shall be paid upon the submission of the report.

CONTRACTOR'S GUARANTEE

We guarantee that all materials used on this job as specified above and that entire job will be done in a professional manner. Any variation from plan or alterations requiring extra labor and materials will be performed upon authorization and billed in addition to the sum covered by this quote. All agreements are contingent upon accidents or delays beyond our control.

If you find the scope and costs of this proposal acceptable, please indicate your authorization by signing at the appropriate location on the following and by returning one complete executed copy of the signature page only for our records.

We look forward to the opportunity of providing our environmental consulting services on this project. If you have any questions, please do not hesitate to contact us.

Respectfully submitted,

Lee, Jake S. 6-7-2007

Signiture of Envitech, llc. representative — Date

Jake S. Lee, Ph.D.

President
Envitech, llc.
9528 226th PL NE
Redmond WA 98053
Registered Washington State Environmental Site Assessor (#5264460-U7)

ACCEPTANCE OF PROPOSAL

The above prices, specifications, and conditions are satisfactory and are hereby accepted. You are authorized to supply the service and/or equipments as specified. Payment will be made as outlined above.

_____

Print or type name of person authorized to sign acceptance of proposal

_____ _____

Authorized signature — Date

TERRA ASSOCIATES, Inc.

Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

March 12, 2007
No. P-3678

Mr. Jong Hun Lee
17520 NE 194th Avenue
Woodinville, Washington 98077

Subject: Proposal
Preliminary Phase II Environmental Site Assessment
Overlake Cleaners
16940 NE 79th Street
Redmond, Washington

Dear Mr. Lee:

We are pleased to present this proposal to provide Preliminary Phase II Environmental Site Assessment (ESA) services to you for the subject property. Our proposed scope of work and fees are described in the following sections of this letter. We have made a brief review of historical information during our on-site meeting with you on February 9, 2007. You are currently in the process of closing the existing laundry business that is present at the subject site. The building will be demolished in the near future to prepare the site for new construction. Approximately ten years ago, the City of Redmond measured perchloroethylene (perc) in one of their nearby drinking water wells. In an effort to understand the source of the perc, we understand that the Washington State Department of Ecology performed some soil sampling that the city drilled a series of monitoring wells near your site and that two monitoring wells were drilled on your site. We further understand that your site was determined to not be the source of the perc in the drinking water well.

The monitoring wells on your property were last sampled approximately ten years ago. One of the wells had perc slightly above the current cleanup level of five parts per billion (ppb). In addition, soil samples obtained by Ecology from the north side of your building had levels of perc in the near-surface soils that were above the current cleanup value of 0.05 parts per million (ppm).

12525 Willows Road, Suite 101, Kirkland, Washington 98034
Phone (425) 821-7777 • Fax (425) 821-4334

SCOPE OF WORK

We propose to perform three tasks to complete the current assessment of your property. These tasks consist of:

1) ***Data Collection and Review.*** We will visit the Washington State Department of Ecology and the City of Redmond. Complete copies of each of the files for this project will be collected. Upon review of the data, we will prepare a brief technical memo summarizing the results of our review.

2) ***Water Sampling From Existing Wells.*** We will obtain water samples from the two wells on your site and, if possible, from the nearby City of Redmond well located in the adjacent right-of-way. The water samples will be tested for chlorinated volatile organic compounds. This testing will include perc and related degradation compounds. Sampling will be done using low flow sampling techniques. Purge water will need to be stored on-site in a labeled drum pending the results of testing. We will prepare a brief technical memorandum with the results of our testing.

3) ***Soil and Supplemental Groundwater Sampling.*** Following removal of the dry cleaning machine and demolition of the building, we will mobilize a GeoProbe soil sampling rig to obtain a series of soil samples from the area of the dry cleaning machine and other areas on your site where suspected releases may have occurred. We have budgeted for ten soil samples. Three of the GeoProbes will extend to the groundwater to obtain supplemental groundwater samples. All sampling will be done in accordance with standard environmental sampling procedures. We will prepare a technical memorandum that presents all of the data and our recommendations for further action on the site.

Please note that our proposed scope of work does not include the following:

- Meetings with Ecology or the City of Redmond.
- The construction of permanent monitoring wells.
- Services not specifically included in the scope of work.
- Coordination with Ecology for site closure.
- Detailed cleanup plans in the event contamination is encountered.
- Geotechnical analysis of your site for the design of a new building. We can provide a separate proposal to prepare a geotechnical study, if requested.

ADDITIONAL WORK

Following the completion of the work described in this letter, we can present a proposal to take this site through final closure with the State of Washington Department of Ecology. We anticipate that final closure will require additional soil sampling, removal of impacted soils (if present), and supplemental groundwater sampling. At least one meeting with Ecology may be required. We will be in a position to provide a realistic cost estimate following the completion of this initial work.

SCHEDULE

We can begin our work within one week of receiving your written authorization to proceed. We will not enter the site without your prior knowledge and approval. Each task will take approximately two weeks to complete. We will submit our final memo approximately three weeks after the completion of the field work. Thus, the overall time schedule is on the order of six to seven weeks. This schedule is based on the current availability of the drilling subcontractors and normal turnaround of samples by the analytical laboratory. Rush sample management can be arranged for a surcharge.

We will keep you informed of our progress during the course of our work.

ESTIMATED FEES

Our services will be invoiced on a time and expense basis in accordance with the attached Fee Schedule and General Conditions. Our estimated costs are as follows:

1. Data Review: $1,900.00
2. Groundwater Sampling: $2,600. Of this amount, approximately $575 is for the cost of analytical testing. The analytical testing includes three water samples, one field duplicate, and one trip blank.
3. Soil and Groundwater Testing: $6,750. This cost includes $2,000 for the GeoProbe sampling Rig and $1,725 for the analytical testing.

Thus, for our current proposed work, the total costs will be on the order of $11,250. We will not exceed this amount without your permission. The costs presented above assume that normal turnaround times at the laboratory are acceptable. The normal turnaround time for analysis is five to seven working days. The surcharge for rush handling at the laboratory is 25 percent for a 5-day turnaround and 50 percent for a 2-day turnaround.

LIMITATIONS

Our findings, conclusions, and recommendations will be based on our site observations, analytical test results, and analysis. We cannot guarantee that we will discover all of the information or impacts that may exist related to past site uses or current site conditions. We will prepare our conclusions and recommendations in accordance with generally accepted professional practices relating to Phase II ESAs.

If our scope of work varies from your requirements, please advise us so we can make the appropriate changes in our proposal.

In the event we find current or past site uses, or conditions that warrant additional work and sampling, we will promptly notify you and make appropriate recommendations.

CLOSURE

If the scope of work and estimated fees outlined in this proposal are acceptable to you, please indicate your authorization to proceed by signing one copy of this letter and return it to our office.

We appreciate the opportunity to submit this proposal and look forward to working with you on this project. If you have any questions or require additional information, please call.

Sincerely yours,
TERRA ASSOCIATES, INC.

Charles R. Lie, L.H.G.
Project Manager

Encl: Fee Schedule and General Conditions

I accept the above conditions
and attached Fee Schedule and
General Conditions.

Signature: _____

Name: _____

Title: _____

Date: _____

TERRA ASSOCIATES, Inc.

Consultants in Geotechnical Engineering, Geology
and
Environmental Earth Sciences

STANDARD FEE SCHEDULE & GENERAL CONDITIONS
EFFECTIVE JANUARY 1, 2007

TERRA ASSOCIATES, Inc. professional service fees are based on the following conditions:

PERSONNEL HOURLY CHARGE:

PRINCIPAL	$ 140.00 per hour
PROJECT MANAGER	$ 100.00 per hour
PROJECT ENGINEER/GEOLOGIST/SCIENTIST	$ 88.00 per hour
STAFF ENGINEER/GEOLOGIST/SCIENTIST	$ 72.00 per hour
SENIOR ENGINEERING TECHNICIAN	$ 63.00 per hour
CADD TECHNICIAN	$ 60.00 per hour
ENGINEERING TECHNICIAN	$ 58.00 per hour
WORD PROCESSOR/CLERICAL	$ 40.00 per hour
LEGAL TESTIMONY AND PREPARATION (4-hour minimum)	$ 200.00 per hour

TRAVEL EXPENSES:

Subsistence reimbursement paid to employees on business for the Client will be charged at a rate of $125.00 per day for projects located more than 60 miles from our office. Portal to portal mileage will be charged for vehicle use at the rate of $.40 per mile.

ADDITIONAL SERVICES:

Charges for equipment furnished by TERRA will be at predetermined rates as indicated on our proposal or as discussed with Client. Charges of services not furnished directly by TERRA such as subcontracted excavating and drilling equipment, special equipment rental, services of outside consultants, fares of public carriers, printing, photographs, ferry tolls, long distance phone calls, special fees, and permits required for the project will be charged at the rate of cost plus 15 %.

LIMITATION OF LIABILITY AND INDEMNITY:

The services provided by TERRA are for the sole benefit of Client. No other person or entity shall be entitled to rely upon the reports or results produced by TERRA. Client agrees to limit TERRA's total professional liability arising from the work done to the greatest of (a) $25,000.00, or (b) TERRA's total fee for services rendered. Upon specific request and payment, TERRA can provide evidence of professional liability insurance up to a maximum of $1,000,000. This insurance is not available for single family residential projects. The charge for such insurance is $500 or 5 percent (5%) of TERRA's fee, whichever is greater. These charges will be in addition to fees charged for professional services and will be billed as a surcharge above professional fees. Client agrees to look solely to TERRA and its insurance proceeds and hereby releases and waives any claims it might have against the employees, officers, directors, and/or shareholders of TERRA. Client agrees to indemnify and defend TERRA, its employees, officers, directors, and shareholders against (1) all claims of professional error or omission arising from the work which, in total, exceed the foregoing; (2) any loss or expense incurred as a result of the breach of any other promise given by Client; and (3) any loss, claim, damage, or expense which is in part or in whole the result of the actions of anyone other than TERRA and its employees.

INVOICES:

TERRA will submit invoices to the Client on a monthly basis, and a final bill upon completion of our work. Payment is due upon presentation of invoice and is past due thirty (30) days from the date of the invoice. Client agrees to pay a finance charge of one and one half percent (1½ %) per month on past due accounts. In the event of default in the payment of fees under this agreement, Client agrees to pay all costs of collection, including collection agency fees and reasonable attorneys' fees incurred.

(Over)

Accepted by _____ Date _____

12525 Willows Road, Suite 101, Kirkland, Washington 98034
Phone (425) 821-7777 • Fax (425) 821-4334

APPENDIX E

Spill Prevention and Response Plan

Spill Prevention and Response Plan

Project: Penny Lane II & III

Location: 7960-7990 170th Avenue NE, Redmond, Washington

Types of Hazardous Substances Used: *(to be completed prior to start of construction)*

Spill Prevention

The following are general requirements for any hazardous substances stored or used at this facility.

General Requirements

- Ensure all hazardous substances are properly labeled.
- Store, dispense, and/or use hazardous substances in a way that prevents releases.
- Provide secondary containment when storing hazardous substances in bulk quantities (~55 g).
- Maintain good housekeeping practices for all chemical materials at the facility.
- Routine/Daily checks in the hazardous substance storage area to be performed by a future person onsite to be named at the commencement of work.
- Monthly inspections of the hazardous substance storage area, secondary containment, and annular space (interior cavity of double wall tank) on any Above-ground Storage Tanks (AST) or Underground Storage Tanks (UST) need to be logged in this plan.
- In general, most substances stored onsite will be minimal in size, such as 5-gallon gasoline cans. Large volume spills are not anticipated involving the work on this site.

Spill Containment

- The general spill response procedure at this facility is to stop the source of the spill, contain any spilled material, and clean up the spill in a timely manner to prevent accidental injury or other damage.
- Small spills will be contained by site personnel if they are able to do so without risking injury. Spill kits are located at the following location: _____ *(to be completed prior to start of construction)*
- Contents of Spill Kit:
  - UN approved 20-gallon pack with screw-top lid.
  - (15) x 19" Absorbent Pads,
  - (3) 3" x 12' Sorbent Socks,
  - (2) 18 x 18" Pillows,
  - (1) Pair Nitrile Gloves, Emergency Handbook, Goggles and
  - (3) Disposal Bags
- Remove all contaminated soil as required at spill location.

Emergency Procedures

- Immediately call **911** in the event of injury, fire or potential fire, or spill of a hazardous substance that gives rise to an emergency situation.
- If a spill has occurred, contact the following persons immediately: *(to be completed prior to start of construction)*

_____	(Primary)	(___) ____ - _____
_____	(Secondary)	(___) ____ - _____
_____	(After Hours Emergency Contact)	(___) ____ - _____

In the event of a large spill, a properly trained employee should:

- Assess the area for any immediate dangers to health or safety (e.g. a wrecked car on fire). If any dangers are present, move away from the area, **call 911**.
- Notify the primary and/or secondary contact from the list above and then continue your spill response. The primary contact should assess additional notification requirements (i.e. notify City of Redmond, Ecology, etc. See Spill Reporting below).
- Retrieve the spill kit from the closest location.
- Assess the size of the leak and any immediate threat of the spill reaching the floor/storm drains or permeable surfaces in the area. If there is an immediate threat and there are no safety concerns, then attempt to block the spill from coming in contact with the floor/storm drain or permeable surface. If no drain covers are available, then try to use absorbent (cat litter) and/or sock booms or rags to stop the spill from getting into the drains or to any permeable surfaces.
- If the spill can be contained with absorbent booms, deploy them around the spill. Use the booms to direct the spill away from any immediate hazards (e.g. a wrecked car).
- If there is no immediate threat to the floor/storm drains or permeable surfaces, or after controlling the spill, try to plug or stop the leak, if possible. If applicable, put on protective gear (gloves, goggles, protective clothing, etc.) and plug the leak.
- Once the spill has been contained and any immediate threat to storm drains or permeable surfaces has been minimized, contact the spill cleanup contractor and dispatch them to clean up the spill or commence spill cleanup procedures.

Spill cleanup for large spills should be handled by the Spill Cleanup Contractor.

Company Name: _____ Phone: _____

(to be completed prior to start of construction)

Spill Reporting

If a hazardous substance spill exceeds 25 gallons or if any amount has been released to soil, surface water, or storm drains, notify the following agencies:

Washington State Department of Ecology	(360) 407-6300
Washington Emergency Management Division	(800) 258-5990
National Response Center (NRC)	(800) 424-8802

Plan Management

The primary contact or designee shall administer this plan and will be responsible for updating and including any required documentation.

Training

All personnel who may respond to any spill, need to be trained on the contents and procedures in this plan. Trained personnel will add their names and dates of training to the Training Log. Only persons trained on this plan shall respond to a spill. If you are not trained and witness a spill, call or notify the primary and secondary contacts listed on Page 2 of this plan.

Spill Tracking

Any spills must be entered into the Spill Log. If a large catastrophic spill occurs, attach additional pages to describe the event. Include known or possible causes, areas affected, and effectiveness of the cleanup. Include a review of the cleanup contractor and their procedures. For small spills, it is sufficient to fill out the Spill Log, and to take measures to prevent a repeat occurrence.

Facility Inspections

Routine inspections will be conducted daily during regular business hours. Daily inspections will include, at a minimum, a visual inspection of the hazardous substances containers and the area immediately adjacent to it for signs of a spill or leak. These inspections do not need to be logged unless a spill or leak is detected. Ideally, these inspections will be conducted by a manager or by regular employees.

Full site inspections will be conducted monthly by the primary contact or designee and, at a minimum, will include those items on the inspection form. If any item on the inspection form is found unacceptable, the inspection form will be attached to this plan. If all items are deemed acceptable; it is sufficient for the inspector to log only the inspection and the results in the Inspection Log.

Penny Lane II

Spill Prevention Inspection Log

A = Acceptable U = Unacceptable If any items are unacceptable, attach Inspection Form with details.

Inspection Month	Year	Inspector Initials	Lids and Labels?	Evidence Of Spills?	Alarms or Sensor?	New Product?	Spill Kit Complete?	Storm Drains?	Items Fixed?
January									
February									
March									
April									
May									
June									
July									
August									
September									
October									
November									
December									
January									
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July									
August									
September									
October									
November									
December									

Inspection Form

Acceptable	Unacceptable	
❒	❒	**Lids and Labels?** Have all lids and caps been returned to their proper place? Do all the containers still have labels?
❒	❒	**Evidence of Spills?** Is there any indication that a spill might have occurred? If so, was the spill properly cleaned up? Was there any spill kit materials used? Was the Spill Log filled out for that incident? Any housekeeping issues?
❒	❒	***For Tanks with alarm systems only* Any Alarms or Sensor issues?** Have there been any alarm conditions in the past month? If alarms have occurred, has the monitoring system been serviced by the manufacturer or an authorized service company? Is the system up and working at this time? Is the sensor working? Did you conduct a test of the alarm and the sensor? When was the last time the sensor was serviced?
❒	❒	**New Hazardous Substances?** Have any new chemical products been purchased? Do you have the MSDS for new products? Have you assessed how to store and handle this new product safely? Have you added the new hazardous substance to the inventory sheet in this plan? Is the container properly labeled?
❒	❒	**Spill Kit Complete?** Have any items been used from the spill kit? If items are missing, is there an associated entry in the Spill Log? Are there any items missing that are currently on order? Is the spill kit stored where it is supposed to be stored? Is there a sufficient supply of daily cleanup materials?
❒	❒	**Storm Drains?** Is there a buildup of sediment in the drain traps? Is there any evidence of drain clogging? Are the drain filters still intact? Any need replacing? Have they been replaced?
❒	❒	**Items Fixed?** Have all deficiencies previously noted been fixed or made acceptable?

List any issues, deficiencies, or failures in detail:

_____

_____

_____

_____

Hazardous Substance Inventory

Major Groups Only

Hazardous Substance	Manufacturer	Quantity/Unit of Issue