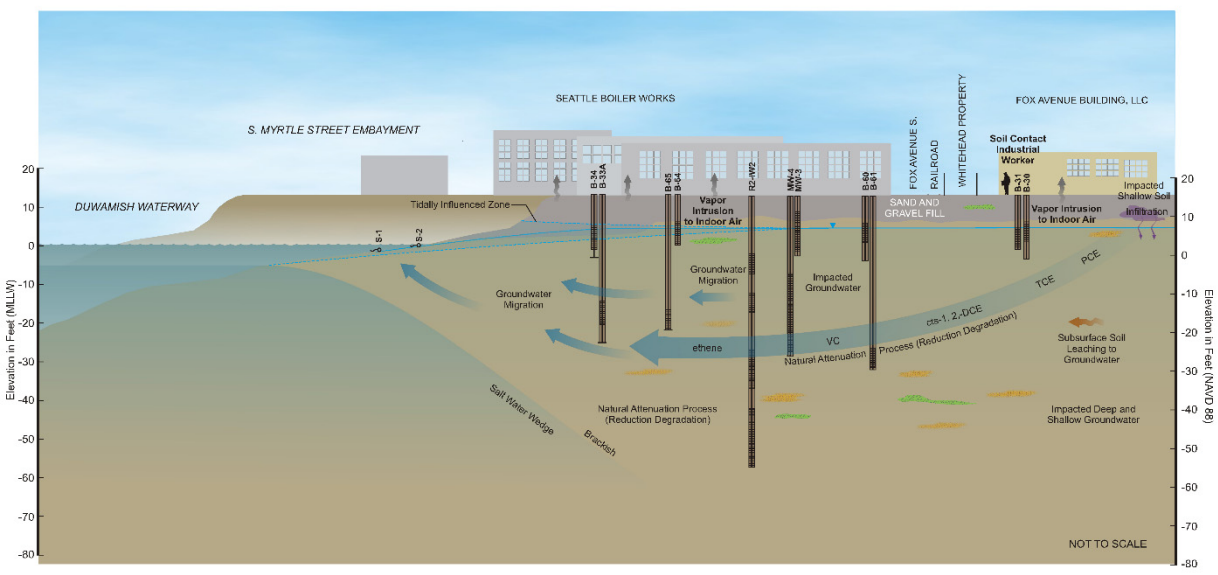
Fox Avenue Site
Seattle, Washington

2016 Annual Report



Prepared for

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LIMITATIONS

This report has been prepared for the exclusive use of the Fox Ave Trust, their authorized agents, and regulatory agencies. It has been prepared following the described methods and information available at the time of the work. No other party should use this report for any purpose other than that originally intended, unless Floyd|Snider agrees in advance to such reliance in writing. The information contained herein should not be utilized for any purpose or project except the one originally intended. Under no circumstances shall this document be altered, updated, or revised without written authorization of Floyd|Snider.

The interpretations and conclusions contained in this report are based in part on site characterization data collected by others. Floyd|Snider cannot assure the accuracy of this information.

Table of Contents

List of Tables

List of Figures

List of Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
bgs	Below ground surface
CAP	Cleanup Action Plan
CUL	Cleanup level
CVOC	Chlorinated volatile organic compound
DCE	Dichloroethene
Ecology	Washington State Department of Ecology
ERD	Enhanced reductive dechlorination

Acronym/ Abbreviation	Definition
Loading Dock	Loading Dock Source Area
µg/L	Micrograms per liter
NW Corner	Northwest Corner Area
PCE	Tetrachloroethene
RL	Remediation Level
Site	Fox Avenue Site
TCE	Trichloroethene
TOC	Total organic carbon
VC	Vinyl chloride
VOC	Volatile organic compound
WBZ	Water Bearing Zone

1.0 Introduction

1.1 PURPOSE OF REPORT

The purpose of this report, jointly prepared by Floyd|Snider, CALIBRE Systems, Inc. (CALIBRE), and Landau Associates (Landau), is to document the cleanup activities and monitoring that occurred in 2016 at the Fox Avenue Site (the Site; Figure 1.1). The work described in this report was performed in accordance with Agreed Order No. 8985 between Fox Ave LLC and the Washington State Department of Ecology (Ecology; Ecology 2012). Per the Cleanup Action Plan (CAP) for the Site, bio-polishing is to be performed following thermal treatment of the chlorinated volatile organic compounds (CVOCs) until the groundwater remediation level (RL) is met. The Main Source Area was thermally treated, as well the Loading Dock Source Area (Loading Dock). One source area, the Northwest Corner Area (NW Corner), was not thermally treated; instead, this area underwent soil vapor extraction. Thermal treatment occurred from January to May of 2013 and achieved its goal of reducing source area soil contaminant concentrations to the RL of an average of 10 milligrams per kilogram (mg/kg) or less of the sum of tetrachloroethene (PCE) and trichloroethene (TCE) concentrations. Following thermal treatment, aquifer temperatures in the Main Source Area were too elevated to implement bio-polishing until mid-2014, as summarized in the 2014 Annual Report (Floyd|Snider 2015).

1.2 GROUNDWATER PERFORMANCE CRITERIA FROM CLEANUP ACTION PLAN

At the Site, three environmental media were historically impacted from releases of solvents: soil, groundwater, and indoor air. RLs were established in the CAP for soil and groundwater that were technology-based.

The groundwater RL was set at a total CVOC concentration of 250 micrograms per liter (µg/L) as measured in wells located downgradient of Fox Avenue S., the conditional point of compliance for groundwater. Per the requirements of the CAP, the groundwater RL must be met within 10 years following the thermal remediation. Therefore, 2016 represents the third year toward this goal.

In addition to the RL for groundwater, cleanup levels (CULs) were established for the individual constituents found in groundwater. These CULs must be met at the seeps along the Myrtle Street Embayment within 15 years following thermal treatment (i.e., end of 2028). CULs must also be met throughout the plume upgradient of the seeps to the conditional point of compliance along Fox Avenue S. within 50 years (end of 2063). The final site-wide CULs for groundwater, as documented in the CAP, are presented in Table 1.1.

The RLs for site soil were achieved in 2013 as documented in the *Construction Completion Report* (Floyd|Snider 2013). Documentation of the achievement of indoor air CULs, both on- and off-site, is contained in the *Construction Completion Report* as well.

Table 1.1
Site-Wide Cleanup Levels for Groundwater

Chemical of Concern	Seep or Groundwater Cleanup Level (µg/L)
Benzene	51
1,1-DCE	3.2
Pentachlorophenol	3.0
PCE	3.3
TCE	30
TPH (Mineral Spirits- to Heavy Oil-Range)	500
Vinyl Chloride (VC)	2.4

Abbreviations:
DCE Dichloroethene
TPH Total petroleum hydrocarbons

2.0 Remedial Actions Undertaken

Remedial actions implemented in 2016 included injection of soluble sugar substrate in selected wells, and performance monitoring of groundwater in areas that had already been injected with soluble sugar or edible oil in 2014. The following sections summarize the work completed in 2016. All work was completed in accordance with previously submitted and approved project work plans.

2.1 PERFORMANCE MONITORING

Performance monitoring included the collection of semi-annual groundwater samples in May of 2016 and again in December of 2016. The May 2016 event included site-wide sampling of many wells; the December sampling event was more selective and focused on assessing performance in specific areas where added enhanced reductive dechlorination (ERD) treatment is necessary, specifically areas/wells from the May 2016 sampling which exceeded the RL.

2.2 SUBSTRATE INJECTION

Soluble sugar substrate was injected in August and December 2016. Table 2.1 provides a summary of the substrate injections.

Table 2.1
Substrate Injection Summary

Well ID	Area	Gallons Injected	Pounds of Sugar Injected
August 2016 Substrate Injections			
R1-IW4a	Along Fox Avenue S.	750	623
R1-IW4b	Along Fox Avenue S.	1,750	1,477
R1-IW5	Along Fox Avenue S.	2,500	2,099
R1-IW6	Along Fox Avenue S.	2,500	2,097
R1-IW7	Along Fox Avenue S.	2,538	2,125
R1-IW10	NW Corner	850	1,150
R1-IW13	NW Corner	850	1,150
R1-IW14	NW Corner	850	1,150
R1-IW15	NW Corner /Loading Dock	2,500	3,382
R2-IW3	S. Myrtle Street	2,500	2,150
R2-IW4	S. Myrtle Street	2,500	2,114
R2-IW5	S. Myrtle Street	2,500	2,114
R2-IW1	Seattle Boiler Works	2,500	2,084

Well ID	Area	Gallons Injected	Pounds of Sugar Injected
August 2016 Substrate Injections (Continued)			
R2-IW2	Seattle Boiler Works	2,500	2,107
R2-IW8	Seattle Boiler Works	2,500	2,119
R2-IW9	Seattle Boiler Works	2,500	2,148
	Total	**32,588**	**30,089**
December 2016 Substrate Injections			
R2-IW1	Seattle Boiler Works	2,568	2,110
R2-IW2	Seattle Boiler Works	2,555	2,100
R2-IW3	S. Myrtle Street	2,584	2,156
R2-IW4	S. Myrtle Street	2,593	2,163
	Total	**10,300**	**8,529**

2.3 BIO-AUGMENTATION

Bio-augmentation was not performed in 2016.

3.0 Groundwater Monitoring Data

3.1 SAMPLING PROCEDURES

Samples from wells were collected using low-flow sampling procedures in accordance with the project work plans. In addition, the seeps in the Myrtle Street Embayment were sampled for volatile organic compounds (VOCs) during a minus low tide on May 9, 2016. All samples were analyzed for the selected list of historically found at the Site. Additional performance monitoring parameters were analyzed for in selected wells. These additional parameters included redox indicators such as total and dissolved iron, sulfate, sulfide, acetylene, methane, ethene, and ethane (AMEE), as well as total organic carbon (TOC) as an indicator of substrate availability.

Samples were delivered under chain-of-custody to Fremont Analytical for analysis. All investigation-derived waste from sampling was containerized and managed in accordance with the project work plans.

3.2 SUMMARY OF DATA FROM GROUNDWATER SAMPLING

2016 VOC data are presented in Table 3.1 and performance parameters are presented in Table 3.2.

3.3 QUALITY ASSURANCE REVIEW AND ENVIRONMENTAL INFORMATION MANAGEMENT LOADING

A basic quality assurance review was performed by Floyd|Snider on all of the analytical laboratory reports received. The reviews concluded that all of the laboratory data were deemed acceptable for use. All data were subsequently uploaded to Ecology's Environmental Information Management database.

4.0 Groundwater Monitoring Data Discussion

Performance data that were collected in 2016 are discussed in this section by treatment area. Figures 4.1 and 4.2 show the May 2016 site-wide results of the sum of the parent product concentrations, PCE and TCE, in the 1st and 2nd Water Bearing Zone (WBZ) wells, respectively. Similarly, Figures 4.3 and 4.4 show the May 2016 distribution of the sum of the daughter product concentrations, cis-1,2-DCE and VC, in the 1st and 2nd WBZ wells. Figures 4.5 and 4.6 show the sum of all CVOCs in the 1st and 2nd WBZ wells site-wide based on the most current data collected.

4.1 MAIN SOURCE AREA AND DOWNGRADIENT TO FOX AVENUE S.

Aquifer conditions for both the 1st and 2nd WBZs were evaluated by comparing performance monitoring groundwater data collected from injection and monitoring wells to baseline data. Baseline data were collected prior to the July 2014 injection of substrate into the 2nd WBZ and the January 2015 injection into the 1st WBZ. These bioremediation activities in the Main Source Area followed thermal treatment that ended in May 2013. Conditions in 2016 in both WBZs were evaluated using data from the January, May, and December 2016 monitoring events. The December 2016 monitoring event occurred 23 months after the injection into the 1st WBZ and 29 months after the injection into the 2nd WBZ. A cumulative summary of Main Source Area data is presented in Table 4.1. Figures 4.7 through 4.10 shown total CVOC baseline (post-thermal and pre-injection) conditions versus current conditions for the 1st and 2nd WBZ in the Main Source Area downgradient to Fox Avenue S.

Data through December 2016 continue to indicate effective bioremediation in the Main Source Area and extending to Fox Avenue S. Analytical data indicate that all concentrations in Fox Avenue S. wells (i.e., B-20AS, B-58S, B-60S, B-21D, B-59D, and B-61D) declined to less than the 250 µg/L Site CVOC treatment goal in May and remained less than the treatment goal in December; May and December are the first two sampling events in which this has occurred since bioremediation began. Additionally, in December, only two wells in the Main Source Area (MW-9S and MW-18S) had concentrations greater than the Site treatment goal; both of these wells are in the 1st WBZ. Isoconcentration contours for total CVOCs in December 2016 showed a substantial reduction in the size of the high concentration core of the plumes compared to baseline in both the 1st WBZ (Figures 4.7 and 4.8) and the 2nd WBZ (Figures 4.9 and 4.10). This contrast is most pronounced in the 2nd WBZ, where total CVOC concentrations were generally less than 50 µg/L. Treatment results in the 1st and 2nd WBZs are further discussed below.

Seven wells were sampled for performance monitoring of the 1st WBZ. Treatment has achieved very low total CVOC concentrations (<15 µg/L) at three of the seven wells (R0-IW09S, B-20AS, and B-60AS); baseline total CVOCs at these wells ranged from 835 to 1,556 µg/L. However, greater CVOC concentrations remained in December at the other four shallow wells (MW-9S, MW-18S, B-49S, and B-58S). Reduced aquifer conditions continue at these four wells, based on May 2016 sulfate and methane concentrations, but treatment effects are declining. With the exception of MW-18S, located in the Main Source Area between injection wells, TOC did not increase at these four wells following donor injection. TOC at MW-18S has decreased to near

baseline throughout 2016, indicating depletion of the electron donor injected nearly 2 years ago. Ethene/ethane, which were detected in 2015 and January 2016, were not detected in either of the 1st WBZ wells tested in December 2016 (R0-IW09S and MW-18S); ethene/ethane are innocuous end products that indicate complete degradation of CVOCs. CVOC data from these four wells are further discussed below.

- December 2016 data from MW-18S, located in the Main Source Area, indicated elevated total CVOCs (904 µg/L), which is a rebound from the post-injection low of 75 µg/L (January 2016), but less than the 1,952 µg/L baseline.
- CVOC concentrations at MW-9, located between the Main Source Area and Fox Avenue S., have declined since bioremediation began, from 1,210 to 984 µg/L.
- CVOC concentrations at B-49, located between the Main Source Area and Fox Avenue S., were much lower in December 2016 (172 µg/L) than the peak (1,226 µg/L in October 2014), but have generally plateaued since September 2015.
- The CVOC concentration in December 2016 at B-58S, a Fox Avenue well, was just less than the Fox Avenue goal at 248 µg/L, a decrease from the 458 µg/L baseline concentration.

Ten wells were sampled in December 2016 for performance monitoring of the 2nd WBZ. A comparison of post-injection data to baseline shows a substantial decline in CVOC concentrations. Total CVOC concentrations were at or less than 50 µg/L at all 2nd WBZ wells in December compared to baseline concentrations ranging from 3 to 7,794 µg/L. Additionally, elevated TOC and/or other donor indicators (e.g., acetone and methyl ethyl ketone) and highly reduced redox conditions (sulfate reducing to methanogenic) continue to indicate conditions conducive to enhancement of bioremediation at all 2nd WBZ wells upgradient of Fox Avenue S. Ethene/ethane were detected at three of the six wells analyzed. At two wells (MW-15D and MW-16D), ethane + ethane was predominant on a molar basis over the chlorinated compounds (i.e., had the greatest molar fraction, as shown on Table 4.1).

4.2 FOX AVENUE S.

The following wells in the NW Corner were sampled in May 2016: R1-IW10, NW1-1, R1-IW12, B-22, and R1-IW15. Two of these wells were also resampled in December 2016: NW1-1 and B-22. The performance monitoring data from this area demonstrate effective treatment; analytical results for total CVOCs are less than the RL in all wells as of the December 2016 sampling event (Well NW1-1 was just greater than the RL at 251 µg/L in May and less than the RL at 143 µg/L in December). Laboratory results from R1-IW15 (sampled at 55 feet below ground surface [bgs]) are less than both the RL and CUL, laboratory results from R1-IW10 (sampled at 11 feet bgs) are less than the RL and approaching the CUL. One well/area in the NW Corner appears to be responding to biological treatment much slower than other nearby wells (Well B-22 in the 1st WBZ, with current CVOCs less than the RL at 210 µg/L, versus other nearby wells approaching the CUL). Focused treatment in this area (1st WBZ only) using Wells R1-IW14 and R1-IW15, and potentially including bio-augmentation, should be planned.

The wells in the Loading Dock that were sampled in May 2016 include: R1-IW21, B-77, and B-78. The performance monitoring data from this area demonstrate effective treatment; analytical results from B-77 and B-78 indicate CVOCs at concentrations less than both the RL and CUL. Laboratory results from R1-IW21 (sampled at 12 feet bgs) are less than the RL and approaching the CUL (a 99.5-percent reduction from the baseline samples collected in 2013).

The following wells along Fox Avenue S. were sampled in May 2016: R1-IW2, R1-IW3a, R1-IW4a, R1-IW4b, R1-IW5 (at 10 feet bgs), R1-IW5 (at 60 feet bgs), R1-IW7 (at 17 feet bgs), R1-IW7 (at 60 feet bgs), B-20a, B-21, R1-IW17 (at 12 feet bgs), R1-IW17 (at 55 feet bgs), B-18, B-19, B-58, B-59, B-60, B-61, B-62, and B-63. Five of these wells were also resampled in December 2016: B-20a, B-21, B-58, B-60, and B-61. The performance monitoring data from this area demonstrate effective treatment; all results as of December 2016 are less than the RL. Analytical results from five wells (R1-IW2 [at 60 feet bgs], R1-IW17 [at 12 feet bgs], R1-IW17 [at 55 feet bgs], B-62, and B-63) indicate CVOCs at concentrations less than both the RL and CUL. Laboratory results from R1-IW3a (at 12 feet bgs), R1-IW4a (at 11 feet bgs), R1-IW4b (at 50 feet bgs), B-20a, and B-60 are less than the RL and approaching the CUL (demonstrating greater than 99-percent reductions from the post-thermal baseline samples collected in the 2014 timeframe).

One well in this area along Fox Avenue S., B-58 in the 1st WBZ, is responding to biological treatment much slower than other nearby wells (current CVOCs are just less than the RL at 249 µg/L, with cis-1,2-DCE as the primary component). Prior sampling from this well has indicated higher sulfate levels, which are now declining. The sulfate competes with the CVOCs for biological reduction processes. As the sulfate is eliminated, full dechlorination of the CVOCs is expected. Similar results were previously noted in nearby Well B-61 (2nd WBZ), which has shown CVOCs decline by 99 percent within 1 year after the sulfate was substantially depleted.

4.3 DOWNGRADIENT OF THE FOX AVENUE SITE

The wells in the Seattle Boiler Works Area that were sampled in May 2016 include: MW-3, MW-4, R2-IW1 (at 17 feet bgs), R2-IW1 (at 45 feet bgs), R2-IW2 (at 17 feet bgs), R2-IW2 (at 45 feet bgs), R2-IW8, R2-IW9, R2-IW10, MW-5, and MW-6. Four of these wells were also resampled again in December 2016: MW-4, R2-IW1 (at 17 feet bgs), R2-IW1 (at 45 feet bgs), and MW-6. The performance monitoring data from this area demonstrate effective treatment; total CVOCs are less than the RL in every well sampled in both sampling events. In addition, the May 2016 results from Wells R2-IW8, MW-4, and R2-IW10 indicate all CVOCs are at concentrations less than both the RL and CUL. One of the treatment wells in this area, R2-IW1, had previously been responding slower to biological treatment than all other nearby wells; the December sampling from this well (at 17 and 45 feet bgs) indicates total CVOCs under 100 µg/L, a 99.5-percent reduction from prior high concentrations in the 2013 timeframe, and a continuing downward trend.

One well in the Seattle Boiler Works Area appears to be responding to biological treatment slower than other areas (Well MW-6 in the 2nd WBZ, with current CVOCs at concentrations less than the RL at 122 µg/L). Focused treatment upgradient of this area (primarily in 2nd WBZ) using Wells R2-IW10 and R2-IW11 should be planned.

The following wells in the Myrtle Street Embayment were sampled in May 2016: B-35, R2-IW3 (at 17 and 30 feet bgs), R2-IW-4, B-64, B-65, R2-IW6, and B-33a. Well B-33a was also resampled again in December 2016. The performance monitoring data indicate that the total CVOCs are less than the RL in every well sampled. Additionally, the May 2016 performance monitoring data for CVOCs from B-35 and R2-IW4 were less than the both RL and the CUL. The May 2016 performance monitoring data from B-65, R2-IW3 (at 30 feet bgs) and R2-IW6 were less than the RL and approaching the CUL (B-65 has demonstrated a 99.99-percent reduction in CVOCs since the start of ERD). The percent reductions in CVOCS observed in most of these wells (all but B-64) exceeds 99.7 percent (from pre-ERD baseline values in the 2004 to 2010 timeframe); Well B-64 is also responding well with 97-percent reduction and progressing toward the CUL.

4.4 SEEPS

Results from the seeps are compared to CULs for the individual chemicals of concern, and not the RL. VC was the only VOC detected at concentrations greater than CULs in three of the four seeps. The concentration of VC in all the seeps following thermal remediation is shown in Table 4.2. Overall, a downward trend is suggested in the data for two of the three seeps. A slight increase was observed in Seep S-3.

Table 4.2
Post-Thermal Vinyl Chloride Concentrations in the Seeps

Seep	2014 (µg/L)	2015 (µg/L)	2016 (µg/L)
S-2	ND	30.9	7.4
S-3	372	7.5	27.1
S-3b	136	72.8	46.4
S-4	ND	ND	ND

Abbreviation:
ND Non-detect

ERD substrate injections were implemented in August and December 2016 in areas upgradient of these seeps.

5.0 Conclusions and Recommendations

5.1 CONCLUSIONS

Overall, the results of the third year of post-thermal bio-polishing are encouraging, with total CVOC concentrations in most wells less than the RL of 250 µg/L total CVOCs and little evidence of rebound. Almost no PCE or TCE remains in groundwater at the Site; the primary contaminants continue to be the daughter products of reductive dechlorination, namely cis-1,2-DCE and VC.

The following paragraphs present conclusions based on 2016 data in the five sub-areas of the Site.

5.1.1 Main Source Area of the Fox Avenue Site

In the Main Source Area, the combination of thermal treatment plus approximately 2 years of bio-polishing have substantially reduced contaminant concentrations at most locations in the Main Source Area. CVOC concentrations along Fox Avenue S. have been less than the Fox Avenue treatment goal for the last two sampling events (May and December 2016). Only two 1st WBZ wells (MW-9S and MW-18S), located upgradient of Fox Avenue S., had December 2016 CVOC concentrations greater than the Fox Avenue goal. Given evidence of declining biotreatment in the 1st WBZ, additional donor injection is likely required for further reduction of shallow CVOC concentrations. Total CVOC concentrations throughout the 2nd WBZ have sustainably declined from the baseline maximum of 7,794 µg/L to at or less than 50 µg/L at all wells, and aquifer conditions remained conducive for continued bioremediation. Accordingly, it does not appear that additional remedial action is necessary in the 2nd WBZ at this time.

5.1.2 Northwest Corner Area

Wells sampled in the NW Corner are showing good response to ERD treatment. Typical CVOC concentrations prior to the start of ERD treatment in this area were in the range of 1,500 to 2,500 µg/L; current CVOC concentrations are in the range of 0.5 to 200 µg/L. The current performance monitoring results indicate all wells sampled have concentrations less than the RL and concentrations at multiple wells in this area (R1-IW10, R1-IW12, and R1-W15) are approaching, or less than, the CUL.

5.1.3 Loading Dock Source Area

Wells sampled in the Loading Dock are showing good response to treatment. The performance monitoring data from this area indicate all wells with concentrations less than the RL and several wells (two of the three wells sampled) also have concentrations less than the CUL. Total CVOCs have been reduced over 99 percent relative to the historical highs.

5.1.4 Fox Avenue S.

Wells sampled in the area along Fox Avenue S. are showing good response to treatment. The performance monitoring data from this area indicate all wells have concentrations less than the RL and multiple wells (five of the wells sampled) also have concentrations less than the CUL, with another five wells showing CVOC levels approaching the CUL. Total CVOCs have been reduced over 99 percent relative to the historical highs.

5.1.5 Seattle Boiler Works

Wells sampled in the Seattle Boiler Works Area are showing good response to ERD treatment. The current performance monitoring results indicate that all wells sampled have concentrations less than the RL and many have concentrations near or less than the CUL. Three wells spanning a transect across the VOC plume footprint (former) into the Seattle Boiler Works property include R2-IW8, MW-4, and R2-IW10. The historical total CVOC levels in these wells ranged from approximately 5,000 to over 8,000 µg/L prior to the start of ERD treatment; current CVOCs (as of May 2016) indicate total CVOC reductions of 99.9+ percent, 99.9+ percent, and 99.8 percent for R2-IW8, MW-4, and R2-IW10, respectively. These wells span the former central area of the VOC plume into the Seattle Boiler Works property and all three now meet the CUL. Total CVOCs have been reduced over 99 percent relative to the historical highs at a majority of the wells in this area.

5.1.6 S. Myrtle Street Area

Wells sampled in the S. Myrtle Street Area are showing good response to treatment. Total CVOCs have been reduced over 99 percent relative to the historical levels at a majority of the wells (current data from many of the wells has demonstrated a reduction of over 99.9 percent). The current performance monitoring results indicate that all wells sampled have concentrations less than the RL and most concentrations are approaching, or less than, the CUL.

5.1.7 Seeps

The seeps continue to show improvement post-thermal treatment. The only VOC present at concentrations greater than CULs in 2016 was VC. Two additional substrate injections were completed upgradient of this area following the May 2016 monitoring event.

5.2 2017 RECOMMENDATIONS

Recommendations for 2017 are as follows:

1. Perform injections of sugar substrate in late February of 2017 in the following 1st WBZ wells in the Main Source Area and also downgradient on the Whitehead property: MW-7, MW-9, B-49, R0-IW4S, and R0-IW9S.
2. Repeat the site-wide groundwater monitoring event again in May of 2017 with less wells sampled in the 2nd WBZ of the Main Source Area due to the low and stable concentrations observed in this area since 2014.

3. Reduce the number of VOCs being reported by the laboratory to only those that have been detected in 2016. This would eliminate reporting of 1,2-dichloroethane, trichloroethane, 1,1,2-trichloroethane, and 1,1,2,2-tetrachloroethane.
4. Specific wells to be targeted for treatment in June of 2017 will be identified after review of the data following the May 2017 groundwater sampling. The following areas are anticipated based the most recent sampling data and past trends:
    - NW Corner
    - Seattle Boiler Works
    - Along Fox Avenue S.
    - Along S. Myrtle Street
5. Perform a more limited round of sampling in November or December of 2017 to assess performance in the areas injected in June of 2017.

6.0 References

Floyd|Snider. 2013. *Construction Completion Report*. Fox Avenue Site, Seattle, Washington. Prepared for Fox Avenue Building LLC, Seattle, Washington. 3 October.

_____. 2015. *2014 Annual Report*. Fox Avenue Site, Seattle, Washington. Prepared for Fox Avenue Building LLC, Seattle, Washington. April.

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Fox Avenue Site
Seattle, Washington

2016 Annual Report

Tables

Table 3.1

Summary of Volatile Organic Compound Data in Groundwater[1]

				Non-Chlorinated Volatile Organic Compounds									Chlorinated Volatile Organic Compounds								
			Analyte	Acetone	Benzene	EB	MEK	Naphthalene	Toluene	1,2,4-TMBZ	Xylene	Xylene (ortho)	1,1-DCA	1,1-DCE	1,2-DCA	cis-1,2-DCE	PCE	trans-1,2-DCE	TCE	VC	Total CVOCs
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Location	Sample ID	WBZ	Sample Date																		
Monitoring Wells																					
Fox Avenue																					
B-18	B-18-050616	1st	05/06/2016	5 U	2.35	1 U	5 U	1 U	2.19	1 U	1.09	1 U	1 U	1 U	1 U	2.84	1 U	1 U	0.5 U	19.4	22.2
	Dup03-050616	1st	05/06/2016	5 U	2.34	1 U	5 U	1 U	2.19	1 U	1.1	1 U	1 U	1 U	1 U	2.82	1 U	1 U	0.5 U	18.8	21.6
B-19	B-19-050616	2nd	05/06/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	38.5	1 U	1 U	0.5 U	22.4	60.9
B-20A	B-20a-050516	1st	05/05/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	93.5	1 U	3.27	0.5 U	71.5	168
	B-20a-121616	1st	12/12/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3.42	1 U	1 U	0.5 U	10.7	14.1
	Dup02-121616	1st	12/12/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3.5	1 U	1 U	0.5 U	12	15.5
B-21	B-21-050516	2nd	05/05/2016	5 U	7.59	1 U	5 U	1 U	8.62	1 U	1.14	1.22	1.47	1 U	1 U	1 U	1 U	1 U	0.5 U	67.8	69.3
	B-21-121216	2nd	12/12/2016	23.7	1 U	1 U	12.8	1 U	4.59	1 U	1 U	1.3	1.81	1 U	1 U	1 U	1 U	1 U	0.5 U	38.4	40.2
B-58	B-58-050516	1st	05/05/2016	5.29	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	89.8	1 U	1 U	2.3	16.8	109
	B-58-120516	1st	12/05/2016	5 U	1.01	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	203	1 U	1.36	0.58	44	249
B-59	B-59-050516	2nd	05/05/2016	5 U	1 U	1 U	5 U	1 U	1.18	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	18.6	18.6
B-60	B-60-050516	1st	05/05/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	104	1 U	2.89	0.5 U	78.2	185
	B-60-120516	1st	12/05/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	7.8	7.8
B-61	B-61-050516	2nd	05/05/2016	5 U	3.16	1 U	5 U	1 U	1.69	1 U	1 U	1 U	1.53	1 U	1 U	21.1	1 U	1.29	0.5 U	84	108
	Dup02-050516	2nd	05/05/2016	5 U	3.58	1 U	5 U	1 U	1.8	1 U	1 U	1 U	1.71	1 U	1 U	28.6	1 U	1 U	0.5 U	169	199
	B-61-120516	2nd	12/05/2016	5 U	2.49	1 U	5 U	1 U	2.37	1 U	1 U	1 U	1.12	1 U	1 U	4.16	1 U	1 U	0.56	35.8	41.6
B-62	B-62-050616	1st	05/06/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	1 U
B-63	B-63-050616	2nd	05/06/2016	5 U	4.66	2.32	5 U	1 U	1.1	1 U	2.33	3.28	2.08	1 U	1 U	1 U	1 U	1 U	0.5 U	1.41	3.49
B-77	B-77-050416	1st	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.15	1 U	0.57	0.2 U	1.72
B-78	B-78-050416	2nd	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	1 U
Main Source Area																					
MW-15D	MW-15D-051016	2nd	05/10/2016	5 U	1 U	2.26	5 U	1 U	9.47	11.1	3.54	1.67	1 U	1 U	1 U	1.4	1 U	1 U	0.5 U	8.64	10
	MW-15D-121216	2nd	12/12/2016	5,880	1 U	1 U	5 U	1.01	50.1	13.5	3.77	2.01	1 U	1 U	1 U	18.2	1 U	1 U	0.5 U	0.02 U	18.2
MW-16D	MW-16D-051016	2nd	05/10/2016	5 U	1 U	27.5	5 U	4.3	3.14	26.2	9.56	2.02	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	1 U
	MW-16D-121316	2nd	12/13/2016	5 U	1 U	3.65	5 U	1.6	1.44	28.8	6.21	2.21	1 U	1 U	1 U	6.84	8.39	1 U	2.86	0.2 U	18.1
MW-17D	MW-17D-051116	2nd	05/11/2016	5 U	6.05	2.74	5 U	1 U	11.1	1 U	2.07	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	2.13	2.13
	MW-17D-121316	2nd	12/13/2016	5 U	4.81	2.63	5 U	1 U	6.78	1 U	2.16	1.01	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	1 U
MW-18S	MW-18S-051016	1st	05/10/2016	5 U	1.12	2.44	5 U	1 U	2.31	1 U	4.45	3.11	2.26	1 U	1 U	26.3	4.29	1 U	0.81	209	243
	MW-18S-121316	1st	12/13/2016	5 U	1 U	1 U	5 U	1 U	1.98	1 U	7.2	5.57	5.37	1 U	1 U	387	3.01	2.51	2.82	511	912
Myrtle Street																					
B-33A	B-33a-050916	2nd	05/09/2016	5 U	10.1	1 U	5 U	1 U	1 U	1 U	1 U	1 U	11.4	1 U	1 U	1 U	1 U	1 U	0.5 U	12.5	23.9
	B-33a-120516	2nd	12/05/2016	5 U	9.05	1 U	5 U	1 U	1 U	1 U	1 U	1 U	7.41	1 U	1 U	1 U	1 U	1 U	0.5 U	15.4	22.8
B-35	B-35-050916	2nd	05/09/2016	5 U	7.28	25	19.1	1 U	1 U	2.48	12	11.7	2.21	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	2.21
B-64	B-64-050916	1st	05/09/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	26.4	1 U	1 U	0.5 U	17.1	43.5
B-65	B-65-050916	2nd	05/09/2016	5 U	1.01	1 U	5 U	1 U	1 U	1 U	1 U	1 U	4.16	1 U	1 U	1 U	1 U	1 U	0.5 U	3.42	7.58

Table 3.1

Summary of Volatile Organic Compound Data in Groundwater[1]

				Non-Chlorinated Volatile Organic Compounds									Chlorinated Volatile Organic Compounds								
			Analyte	Acetone	Benzene	EB	MEK	Naphthalene	Toluene	1,2,4-TMBZ	Xylene	Xylene (ortho)	1,1-DCA	1,1-DCE	1,2-DCA	cis-1,2-DCE	PCE	trans-1,2-DCE	TCE	VC	Total CVOCs
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Location	Sample ID	WBZ	Sample Date																		
Monitoring Wells (Cont.)																					
Northwest Corner																					
B-22	B-22-050416	1st	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	113	59.7	1.47	28.9	5.06	208
	Dup01-050416	1st	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	114	62.9	1.49	26.4	4.68	209
	B-22-120616	1st	12/06/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	108	47.1	1.82	33.9	19	210
NW 1-1	NW1-1-050416	1st	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	7.5	1 U	210	1 U	1.25	15.6	24.2	259
	NW1-1-120616	1st	12/06/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	116	1 U	1 U	0.5 U	27.2	143
Seattle Boiler Works																					
MW-03	MW-3-051016	1st	05/10/2016	5 U	2.2	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5.2	1 U	1 U	0.5 U	6.16	11.4
MW-04	MW-4-051016	2nd	05/10/2016	5 U	6.09	31.7	5 U	1 U	1 U	2.51	3.45	5.91	3.89	1 U	1 U	1 U	1 U	1 U	0.5 U	122	126
	MW-4-120516	2nd	12/05/2016	5 U	7.71	38.1	5 U	1 U	1 U	4.24	3.98	2.04	3.78	1 U	1 U	1 U	1 U	1 U	0.5 U	0.7	4.48
MW-05	MW-5-051016	1st	05/10/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.44	6.78	1 U	1.1	0.2 U	10.3
MW-06	MW-6-051016	2nd	05/10/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.02	65.5	26.1	1.85	12.7	4.33	112
	MW-6-120516	2nd	12/05/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	90.7	18.8	1.44	9.6	1.87	122
Whitehead																					
B-45	B-45-051116	2nd	05/11/2016	5 U	1.34	1 U	5 U	1 U	2.28	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	5.92	5.92
	B-45-121216	2nd	12/12/2016	5 U	1 U	1 U	5 U	1 U	3.15	1 U	1 U	1.54	1 U	1 U	1 U	1.15	2.15	1 U	0.65	45.9	49.9
B-49	B-49-051116	1st	05/11/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	4	1 U	113	13.7	1.11	8.78	124	265
	B-49-121216	1st	12/12/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	24.3	121	1 U	26.6	0.2 U	172
MW-07	MW-7-051116	1st	05/11/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1	1 U	74.8	64	1.11	39.2	4.25	184
MW-08	MW-8-051116	2nd	05/11/2016	5 U	2.92	1 U	5 U	1 U	5.03	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	67	67
MW-09	MW-9-051116	1st	05/11/2016	5 U	1.5	1 U	5 U	1 U	1.5	1 U	1.05	1 U	1 U	8.1	1 U	313	55.5	5.81	48.5	818	1,250
	MW-9-1212116	1st	12/12/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1.03	5.2	1 U	467	42.5	34.5	56.5	418	1,020
MW-10	MW-10-051116	2nd	05/11/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	26.6	1.04	1 U	0.6	78.8	107
	DUP-1-051116	2nd	05/11/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	29	1.13	1 U	0.52	81.2	112
	MW-10-121216	2nd	12/12/2016	28.8	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U
	Dup-1-121216	2nd	12/12/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	8.74	1 U	1 U	0.73	30.1	39.6
Injection Wells																					
Fox Avenue																					
R1-IW17	R1-IW17-12-050616	1st	05/06/2016	5 U	2.37	59	5 U	6.95	1 U	27.2	35.6	17.8	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1.25	1.25
	R1-IW17-55-050616	2nd	05/06/2016	5 U	2.44	49.4	5 U	6.83	1	23.7	32.4	17.1	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	1.14	1.14
R1-IW2	R1-IW2-050516	2nd	05/05/2016	5 U	1 U	1 U	5 U	1 U	2.74	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.44	0.44
R1-IW3A	R1-IW3a-050516	1st	05/05/2016	5 U	1 U	1 U	5 U	1 U	74.6	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.53	3.69	4.22
R1-IW4A	R1-IW4a-050516	1st	05/05/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	6.92	6.92
R1-IW4B	R1-IW4b-050516	2nd	05/05/2016	5 U	1 U	2.88	5 U	1 U	1,010	1 U	1	1 U	1 U	1 U	1 U	2.53	1 U	1 U	0.5 U	5.89	8.42
R1-IW5	R1-IW5-10-050516	1st	05/05/2016	5 U	1 U	1 U	5 U	1 U	23.1	1 U	1 U	1 U	1 U	1 U	1 U	4.72	1 U	1 U	0.5 U	25.2	29.9
	R1-IW5-60-050516	2nd	05/05/2016	5 U	1 U	1 U	5 U	1 U	26.4	1 U	1 U	1 U	1 U	1 U	1 U	4.81	1 U	1 U	0.5 U	29.1	33.9

Table 3.1
Summary of Volatile Organic Compound Data in Groundwater[1]

				Non-Chlorinated Volatile Organic Compounds									Chlorinated Volatile Organic Compounds								
			Analyte	Acetone	Benzene	EB	MEK	Naphthalene	Toluene	1,2,4-TMBZ	Xylene	Xylene (ortho)	1,1-DCA	1,1-DCE	1,2-DCA	cis-1,2-DCE	PCE	trans-1,2-DCE	TCE	VC	Total CVOCs
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Location	Sample ID	WBZ	Sample Date																		
Injection Wells (Cont.)																					
Fox Avenue (Cont.)																					
R1-IW7	R1-IW7-17-050616	1st	05/06/2016	5 U	1 U	9.6	5 U	2.57	13.2	10.6	6.21	2.52	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	14.4	14.4
	R1-IW7-60-050616	2nd	05/06/2016	5 U	1.08	9.65	5 U	2.47	21.5	10.2	6.24	2.66	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	13.2	13.2
Loading Dock																					
R1-IW21	R1-IW21-050416	1st	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.07	3.21	1 U	1 U	0.5 U	8.91	13.2
Main Source Area																					
R0-IW2D	R0-IW02D-051016	2nd	05/10/2016	18	1 U	1 U	50.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	14.2	1 U	1 U	0.77	9.84	24.8
	R0-IW02D-121216	2nd	12/12/2016	1,930	1 U	1 U	91.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	32.1	1 U	1 U	1.38	9.65	43.1
R0-IW6D	R0-IW06D-051016	2nd	05/10/2016	311	1 U	1 U	85.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	8.71	1 U	1 U	1.92	11	21.6
	R0-IW06D-121216	2nd	12/12/2016	5 U	1 U	1 U	101	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	16.7	1 U	1 U	3.49	19.5	39.7
R0-IW9S	R0-IW09S-051016	1st	05/10/2016	5 U	1 U	1 U	5 U	1 U	1.32	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	1 U
	R0-IW09S-121316	1st	12/13/2016	5 U	1 U	1 U	5 U	1 U	1.34	1 U	1 U	1 U	1 U	1 U	1 U	1.01	1 U	1 U	0.5 U	0.2 U	1.01
Myrtle Street																					
R2-IW3	R2-IW3-17-050916	1st	05/09/2016	23.1	7.56	31.1	513	1 U	4.7	1 U	7.16	6.6	3.6	1 U	1 U	2.04	1 U	1 U	0.5 U	11.8	17.4
	R2-IW3-30-050916	2nd	05/09/2016	19.3	6.82	23.7	437	1 U	4.42	1 U	5.81	5.51	3.68	1 U	1 U	2.07	1 U	1 U	0.5 U	8.01	13.8
R2-IW4	R2-IW4-45-050616	2nd	05/06/2016	101	2.56	3.18	1,470	1 U	45.3	1 U	1 U	1.54	1.15	1 U	1 U	2.18	1 U	1 U	0.5 U	0.58	3.91
R2-IW6	R2-IW6-30-050916	2nd	05/09/2016	122	5.57	2.94	5,440	1 U	15.3	1 U	1.62	1.02	1.97	1 U	1 U	1.48	1 U	1 U	0.5 U	2.77	6.22
Northwest Corner																					
R1-IW10	R1-IW10-050416	1st	05/04/2016	6.84	1 U	1 U	5 U	1 U	1.13	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	5.78	5.78
R1-IW12	R1-IW12-050416	1st	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1.2	1 U	1 U	23.5	1 U	1 U	0.5 U	10.7	35.4
R1-IW15	R1-IW15-050416	2nd	05/04/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.61	1 U	1 U	0.5 U	0.49	7.1
Seattle Boiler Works																					
R2-IW1	R2-IW1-17-050916	1st	05/09/2016	90.7	1.45	1 U	5,940	1 U	663	1 U	1 U	1 U	1 U	1 U	1 U	138	1 U	1 U	0.76	180	319
	R2-IW1-45-050916	2nd	05/09/2016	84.9	1.46	1 U	5,590	1 U	578	1 U	1 U	1 U	1 U	1 U	1 U	146	1 U	1 U	0.78	265	412
	Dup04-050916	2nd	05/09/2016	69.2	1.62	1 U	5,360	1 U	578	1 U	1 U	1 U	1 U	1 U	1 U	169	1 U	1 U	0.62	260	430
	R2-IW1-17-120516	1st	12/05/2016	5 U	1.2	1 U	946	1 U	494	1 U	1 U	1 U	1 U	1 U	1 U	23.4	1.02	1 U	1.02	55.2	80.6
	R2-IW1-45-120516	2nd	12/05/2016	5 U	1.18	1 U	625	1 U	470	1 U	1 U	1 U	1 U	1 U	1 U	24.3	1.05	1 U	1.08	64.2	90.6
	Dup01-120516	2nd	12/05/2016	5 U	1.19	1 U	883	1 U	457	1 U	1 U	1 U	1 U	1 U	1 U	24.2	1.04	1 U	1.07	60.2	86.5
R2-IW10	R2-IW10-12-051016	1st	05/10/2016	5 U	1 U	1 U	83.8	1 U	390	1 U	1 U	1 U	1 U	1 U	1 U	3.98	1 U	1 U	0.5 U	1.9	5.88
	Dup05-051016	1st	05/10/2016	5 U	1 U	1 U	84.2	1 U	360	1 U	1 U	1 U	1 U	1 U	1 U	3.28	1 U	1 U	0.5 U	1.48	4.76
R2-IW2	R2-IW2-17-050916	1st	05/09/2016	160	1.42	1 U	6,990	1 U	687	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.89	8.13	9.02
	R2-IW2-45-050916	2nd	05/09/2016	157	1.27	1 U	6,960	1 U	709	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.89	7.55	8.44
R2-IW8	R2-IW8-63-051016	2nd	05/10/2016	5 U	3.18	6.9	29.5	1 U	580	2.69	3.83	1.99	1.12	1 U	1 U	1.72	1 U	1 U	0.5 U	2.2	5.04
R2-IW9	R2-IW9-12-051016	1st	05/10/2016	5 U	1.61	1 U	5 U	1 U	1.44	1 U	1 U	1 U	1 U	1 U	1 U	11.9	1 U	1.01	0.5 U	41.9	54.8

Table 3.1

Summary of Volatile Organic Compound Data in Groundwater[1]

				Non-Chlorinated Volatile Organic Compounds									Chlorinated Volatile Organic Compounds								
			Analyte	Acetone	Benzene	EB	MEK	Naphthalene	Toluene	1,2,4-TMBZ	Xylene	Xylene (ortho)	1,1-DCA	1,1-DCE	1,2-DCA	cis-1,2-DCE	PCE	trans-1,2-DCE	TCE	VC	Total CVOCs
			Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Location	Sample ID	WBZ	Sample Date																		
Seep Data																					
S-2	SP-02-050916		05/09/2016	5 U	1 U	1 U	18	1 U	1 U	1 U	1 U	1 U	1.03	1 U	1 U	1.57	1 U	1 U	0.5 U	7.39	9.99
S-13 (Calibre S-3)	SP-03-050916		05/09/2016	5 U	7.89	1 U	5 U	1 U	1 U	1 U	1 U	1 U	4.64	1 U	1 U	8.03	1 U	1 U	0.67	27.1	40.4
S-3b	SP-03b-050916		05/09/2016	5 U	1.32	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1.48	1 U	2.53	104	1 U	11.7	0.5 U	46.4	166
S-16 (Calibre S-4)	SP-04-050916		05/09/2016	5 U	1 U	1 U	5 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.5 U	0.2 U	1 U

Abbreviations:

CVOC Chlorinated volatile organic compound
DCA Dichloroethane
DCE Dichloroethene
EB Ethylbenzene
MEK Methyl ethyl ketone
µg/L Micrograms per liter
PCE Tetrachloroethene
TCE Trichloroethene
TMBZ Trimethylbenzene
VC Vinyl chloride
WBZ Water bearing zone

Qualifier:

U Analyte is not detected at the associated reporting limit.

Table 3.2
Summary of Performance Parameters in Groundwater[1]

				Conventionals			Dissolved Gases			Metals	
			Analyte	Total Organic Carbon	Sulfate	Sulfide	Ethane	Ethene	Methane	Iron, Dissolved	Iron, Total
			Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L
Location	Sample ID	WBZ	Sample Date								
Monitoring Wells											
Fox Avenue											
B-20A	B-20a-050516	1st	05/05/2016	8.08	44	0.5 U	0.005 U	0.005 U	1.03	6,330	16,800
B-21	B-21-050516	2nd	05/05/2016	16.8	1.5 U	3	0.0227	0.128	1.76	11,000	81,800
	B-21-121216	2nd	12/12/2016		2.29 JQ						
B-58	B-58-050516	1st	05/05/2016	19	93.4	0.5 U				232	21,700
	B-58-120516	1st	12/05/2016		74						
B-59	B-59-050516	2nd	05/05/2016	3.24	12.3	0.5 U	0.005 U	0.005 U	4.9	110	38,700
B-60	B-60-050516	1st	05/05/2016	17.3	29.5	0.5 U	0.00779	0.005 U	1.72	2,100	17,500
	B-60-050516	1st	05/05/2016		13.6						
B-61	B-61-050516	2nd	05/05/2016	6.44	4.63	0.5 U	0.0493	0.0127	2.61	40,400	58,600
	B-61-120516	2nd	12/05/2016		7.75						
B-62	B-62-050616	1st	05/06/2016		2.03						
B-63	B-63-050616	2nd	05/06/2016		1.5 U						
Main Source Area											
MW-15D	MW-15D-051016	2nd	05/10/2016	64.4	0.862	0.6 JQ	0.0994 J	0.0281 J	9.47 J	7,720	9,550
	MW-15D-121216	2nd	12/12/2016	101	163		0.272	0.0459		21,900	28,600
MW-16D	MW-16D-051016	2nd	05/10/2016	4.35	0.285 JQ	0.5 U	0.005 U	0.005 U	6.92	37,800	40,900
	MW-16D-121316	2nd	12/13/2016	43.7	2.59 JQ		0.0152	0.005 U		27,300	29,900
MW-17D	MW-17D-051116	2nd	05/11/2016	49.7	1.5 U	0.5 U	0.0451	0.005 U	4.39	18,700	19,100
	MW-17D-121316	2nd	12/13/2016	121	14.7 JQ		0.0381	0.005 U		20,600	23,000
MW-18S	MW-18S-051016	1st	05/10/2016	74.4	152	0.5 U	0.005 U	0.005 U	3.59	4,530	4,870
	MW-18S-051016	1st	05/10/2016	80.4	207		0.005 U	0.005 U		5,980	6,260
Myrtle Street											
B-35	B-35-050916	2nd	05/09/2016		1.5 U						
Seattle Boiler Works											
MW-03	MW-3-051016	1st	05/10/2016		5.44						
MW-04	MW-4-051016	2nd	05/10/2016		1.5 U						
	MW-4-120516	2nd	12/04/2016		1.27 JQ						
Whitehead											
B-45	B-45-051116	2nd	05/11/2016	5.14	1.28 JQ	0.5 U	0.0403	0.005 U	7.63	44,300	49,100
B-49	B-49-051116	1st	05/11/2016	3.12	13.8	0.5 U	0.005 U	0.005 U	3.12	8,150	8,740
MW-09	MW-9-051116	1st	05/11/2016	18.4	15.4	0.5 U	0.005 U	0.005 U	3.18	10,800	12,000
MW-10	MW-10-051116	2nd	05/11/2016	12.9	44.4	0.5 U	0.005 U	0.005 U	3.97	6,500	6,610
	DUP-1-051116	2nd	05/11/2016	13.3	43.6	0.5 U	0.005 U	0.005 U	5.35	6,190	6,620
Injection Wells											
Fox Avenue											
R1-IW17	R1-IW17-12-050616	1st	05/06/2016	11.1							
	R1-IW17-55-050616	2nd	05/06/2016	10.8							
R1-IW2	R1-IW2-050516	2nd	05/05/2016	8.95							
R1-IW3A	R1-IW3a-050516	1st	05/05/2016	4.58							
R1-IW4A	R1-IW4a-050516	1st	05/05/2016	14.4							
R1-IW4B	R1-IW4b-050516	2nd	05/05/2016	15.1							
R1-IW5	R1-IW5-10-050516	1st	05/05/2016	10.7							
	R1-IW5-60-050516	2nd	05/05/2016	11.2							
R1-IW7	R1-IW7-17-050616	1st	05/06/2016	6.59							
	R1-IW7-60-050616	2nd	05/06/2016	7.48							
Loading Dock											
R1-IW21	R1-IW21-050416	1st	05/04/2016	11							
Main Source Area											
R0-IW2D	R0-IW02D-051016	2nd	05/10/2016	736	0.472 JQ	0.5	0.005 U	0.005 U	1.65	210,000	218,000
	R0-IW02D-121216	2nd	12/12/2016	927	4.89 JQ		0.005 U	0.005 U		336,000	332,000
R0-IW6D	R0-IW06D-051016	2nd	05/10/2016	1250	75.9	0.7	0.005 U	0.005 U	0.616	488,000	501,000
	R0-IW06D-121216	2nd	12/12/2016	1030	49.6		0.005 U	0.005 U		580,000	557,000
R0-IW9S	R0-IW09S-051016	1st	05/10/2016	67.4	0.355 JQ	2.5 U	0.005 U	0.005 U	2.73	89,400	97,800
	R0-IW09S-121316	1st	12/13/2016	99.4	2.94 JQ		0.005 U	0.005 U		62,800	78,300
Myrtle Street											
R2-IW3	R2-IW3-17-050916	1st	05/09/2016	157							
	R2-IW3-30-050916	2nd	05/09/2016	139							
R2-IW4	R2-IW4-45-050616	2nd	05/06/2016	167							
Northwest Corner											
R1-IW10	R1-IW10-050416	1st	05/04/2016	10.4							
R1-IW12	R1-IW12-050416	1st	05/04/2016	8.34							
R1-IW15	R1-IW15-050416	2nd	05/04/2016	4.57							

Table 3.2

Summary of Performance Parameters in Groundwater[1]

				Conventionals			Dissolved Gases			Metals	
			Analyte	Total Organic Carbon	Sulfate	Sulfide	Ethane	Ethene	Methane	Iron, Dissolved	Iron, Total
			Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L
Location	Sample ID	WBZ	Sample Date								
Injection Wells (Cont.)											
Seattle Boiler Works											
R2-IW1	R2-IW1-17-050916	1st	05/09/2016	121							
	R2-IW1-45-050916	2nd	05/09/2016	127							
	R2-IW1-17-120516	1st	12/05/2016	1,980							
	R2-IW1-45-120516	2nd	12/05/2016	1,850							
R2-IW10	R2-IW10-12-051016	1st	05/10/2016	24.5							
Seattle Boiler Works (Cont.)											
R2-IW2	R2-IW2-17-050916	1st	05/09/2016	145							
	R2-IW2-45-050916	2nd	05/09/2016	156							
R2-IW8	R2-IW8-63-051016	2nd	05/10/2016	6.97							
R2-IW9	R2-IW9-12-051016	1st	05/10/2016		7.46						

Note:

1 Blank cells indicate analyte was not analyzed for the sample.

Abbreviations:

µg/L Micrograms per liter
mg/L Milligrams per liter
WBZ Water bearing zone

Qualifiers:

J Analyte is detected, concentration is estimated.
JQ Analyte is detected between the method detection limit and method reporting limit, the concentration is estimated.
U Analyte is not detected at the associated reporting limit.

TABLE 4.1
GROUNDWATER DATA SUMMARY
MAIN SOURCE AREA
CASCADE COLUMBIA/FOX AVENUE

			Volatile Organic Compounds								Aquifer Redox Conditions								Donor Indicators				Other		VOCs- micromoles/Liter(b)						VOCs - Molar Fraction (d)				
Well	Date	Elapsed Time From Injection (days) (a)	Sum CVOCs (c) (µg/L)	PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Iron (T) (mg/L)	Iron (D) (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (mg/L)	TOC (mg/L)	Acetone (µg/L)	MEK (µg/L)	pH	Temp (deg C)	Comments	PCE	TCE	cDCE	VC	Ethene/ Ethane	Total Chloroethenes (c)	PCE	TCE	cDCE	VC	Ethene/Ethane
RO-IW01D	2/25/2014	-146	952	<1.01	91.0	854	6.65						0.8			4.2			3.41				44.4		0.00	0.69	8.8	0.11		9.6	0.00	0.07	0.92	0.01	
RO-IW02D	2/25/2014	-146	2,808	649	1,000	1,090	68.7						2.0			38.9			6.45				25.6		3.9	7.6	11	1.1		24	0.16	0.32	0.47	0.05	
	5/14/2014	-68	12	<1	0.77	10.9	<0.2	<5	<5	ND	0.41	-76.5	2.2			38.7	<0.5	0.131	2.60	<5	<5	9.39	28.3	Clear, low, no odor/no sheen	0.00	0.01	0.11	0.00	0.00	0.12	0.00	0.05	0.95	0.00	0.00
	6/20/2014	-31	12	<1	0.664	9.63	1.25				0.59	-72.9								<5	<5	6.76	24.3	Clear, low, no odor/no sheen	0.00	0.01	0.10	0.02		0.12	0.00	0.04	0.80	0.16	
	10/22/2014	93	0.8	<1	<0.5	<1	0.75				3.34		7.5	953	890	699	<0.5		31.6	333	678	4.79	24.2	Cloudy, turbid, vomit-like smell, no sheen, well under very high pressure, water meter collected orange particulate and oil, effervescent	0.00	0.00	0.00	0.01		0.01	0.00	0.00	0.00	1.00	
	1/8/2015	171	21	<1	0.63	13.1	7.41	<5	<5	ND	6.64		5.6	566	542	178	<0.5	0.432	2,180	139	174	4.79	19.5	Light orange, low-med turbidity, vomit like odor, no sheen, efferevescent	0.00	0.00	0.14	0.12	0.00	0.26	0.00	0.02	0.52	0.46	0.00
	5/14/2015	297	129	<1	1.02	35.4	92.8				1.82	-96.0	5.0	642	650	162	2.40		2,500	188	285	9.77	15.1	Slightly turbid, colorless, no sheen, organic odor, slight effervescense	0.00	0.01	0.37	1.48		1.86	0.00	0.00	0.20	0.80	
	9/29/2015	435	135	<1	0.87	64.2	69.8	28.8	24.3	<5	0.61	-28.4	5.6	823	870	241	<0.5	2.33	2,720	147	265	4.50	15.3	Clear, colorless, no sheen, strong vomit-like odor, effervescent	0.00	0.01	0.66	1.12	1.97	1.79	0.00	0.00	0.18	0.30	0.52
	5/10/2016	659	25	<1	0.770	14.2	9.84	<5	<5	<5	0.40	-71.6	1.5	218	210	0.472	0.500	1.65	736	18.0	50.9	4.79	18.7	Colorless, slight turbidity, slight sulfur-like odor, no sheen	0.00	0.01	0.15	0.16	0.00	0.31	0.00	0.02	0.47	0.51	0.00
	12/12/2016	875	43	<1	1.38	32.1	9.65	<5	<5		0.71	-43.7	3.2	332	336	4.89			927	1,930	91.9	4.93	9.8	Very turbid, grayish color, injection fluid odor, slight sheen	0.00	0.01	0.33	0.15	0.00	0.50	0.00	0.02	0.67	0.31	0.00
RO-IW03D	2/25/2014	-146	369	109	171	84.3	4.88						2.4			14.3			3.16				21.7		0.66	1.3	0.87	0.08		2.9	0.23	0.45	0.30	0.03	
RO-IW04S	2/25/2014	-337	742	<1.00	2.25	734	5.84						1.6			6.0			19.7				57.2		0.00	0.02	7.6	0.09		7.7	0.00	0.00	0.99	0.01	
RO-IW04D	2/25/2014	-146	192	<1.00	<0.500	191	1.06						1.8			0.5			8.31				48.3		0.00	0.00	2.0	0.02		2.0	0.00	0.00	0.99	0.01	
RO-IW05S	2/25/2014	-337	385	<1.00	<0.500	381	3.51						0.4			<0.300			53.5				52.8		0.00	0.00	3.9	0.06		4.0	0.00	0.00	0.99	0.01	
RO-IW05D	2/25/2014	-146	50	<1.00	1.46	27.1	21.6						1.4			16.9			4.11				39.4		0.00	0.01	0.28	0.35		0.64	0.00	0.02	0.44	0.54	
RO-IW06S	3/3/2014	-331	856	<1.00	3.23	849	3.55						1.6			<0.300			27.0				52.2		0.00	0.02	8.8	0.06		8.8	0.00	0.00	0.99	0.01	
RO-IW06D	2/25/2014	-146	1,219	<1.00	<0.500	598	621						0.2			16.2			9.83				29.4		0.00	0.00	6.2	9.9		16	0.00	0.00	0.38	0.62	
	5/14/2014	-68	8.1	<1	<0.5	2.95	5.18	<5	<5	ND	0.05	-107.0	0.0			35.4	<0.5	0.380	3.81	<5	<5	6.92	33.1	Clear, low, no odor/no sheen, effervescent	0.00	0.00	0.03	0.08	0.00	0.11	0.00	0.00	0.27	0.73	0.00
	10/23/2014	94	8.7	<1	0.72	<1	8				1.74	-45.2	3.2	1,390	1,480	1,360	<0.5		26.7	1,130	647	4.76	27.6	Cloudy, light orange, moderate turbidity, vomit-like odor, NS, orange particulate on probe, well under pressure, effervescent	0.00	0.01	0.00	0.13		0.13	0.00	0.04	0.00	0.96	
	1/8/2015	171	27	<1	1.28	10.0	15.3	<5	<5	ND	1.91	-23.4	2.4	807	821	860	5.20	0.837	2,810	332	218	4.83	26.1	Orange, low-med turbidity, vomit like odor, no sheen, orange particles, effervescent	0.00	0.01	0.10	0.24	0.00	0.36	0.00	0.03	0.29	0.68	0.00
	5/14/2015	297	174	<50	32.5	96	45						0.8	849	1,030	974	16.8		5,070	558	<250			Orange, oily, organic, vomit-like odor, no sheen	0.00	0.25	0.99	0.72		1.96	0.00	0.13	0.51	0.37	
	9/28/2015																						21.6	Orange, oily, vomit-like odor, no sheen; oil content too high for lab to analyze as a water sample											
	5/10/2016	659	22	<1	1.92	8.71	11.0	<5	<5	<5	0.37	-80.0	2.0	501	488	75.9	0.700	0.616	1,250	311	85.1	4.7	19.0	Yellowish, high turbidity, sour odor, no sheen	0.00	0.01	0.09	0.18	0.00	0.28	0.00	0.05	0.32	0.63	0.00
	12/12/2016	875	40	<1	3.49	16.7	19.5	<5	<5		0.67	-159.2	3.6	557	580	49.6			1,030	<5	101	5.3	11.8	Clear with suspended particles, colorless, injection fluid odor, slight sheen	0.00	0.03	0.17	0.31	0.00	0.51	0.00	0.05	0.34	0.61	0.00
RO-IW07S	2/26/2014	-336	505	<1.00	3.83	499	1.88						0.8			<0.300			25.4				54.4		0.00	0.03	5.1	0.03		5.2	0.00	0.01	0.99	0.01	
RO-IW07D	2/26/2014	-145	359	147	116	74.3	21.3						2.0			4.12			4.93				20.6		0.89	0.88	0.77	0.34		2.9	0.31	0.31	0.27	0.12	
RO-IW08S	2/26/2014	-336	799	58.3	55.2	677	8.08						0.2			156			131				52.8		0.35	0.42	7.0	0.13		7.9	0.04	0.05	0.89	0.02	
RO-IW08D	2/26/2014	-145	1,466	<1.01	3.17	1,090	373						1.4			2.5			6.98				41.7		0.00	0.02	11	6.0		17	0.00	0.00	0.65	0.35	
RO-IW09S	2/26/2014	-336	800	56.9	34.0	704	5.57						0.2			29.0			30.5				48.9		0.34	0.26	7.3	0.09		8.0	0.04	0.03	0.91	0.01	
	5/14/2014	-259	835	105	66.6	657	6.35	<5	<5	ND	0.11	-130.2	0.2			31.9	<0.5	1.08	13.6	<5	<5	9.68	41.2	Slight amber color, low turb, no odor/no sheen, effervescent	0.63	0.51	6.8	0.10	0.00	8.02	0.08	0.06	0.85	0.01	0.00
	5/13/2015	105	106	<1	0.66	88.8	16.6				1.85	-76.9	3.8	1,120	1,270	1,550	24.8		23.3	31,100	4,030	5.45	21.8	Clear, grayish color, organic decaying odor, no sheen, very effervescent	0.00	0.01	0.9	0.27		1.19	0.00	0.00	0.77	0.22	
	9/28/2015	243	14	<1	<0.5	11	2.71	20.8	22.3	<5	0.10	-62.0	3.4	101	87.3	2.83	<0.5	2.09	75.6	11.5	<5	6.90	25.2	Turbid, vomit-like odor, no sheen, slightly effervescent	0.00	0.00	0.1	0.04	1.59	0.16	0.00	0.00	0.06	0.02	0.91
	5/10/2016	468	ND	<1	<0.5	<1	<0.2	<5	<5	<5	0.03	-140.0	1.4	97.8	89.4	0.355	<2.5	2.73	67.4	<5	<5	6.45	19.3	Clear, colorless, organic odor, no sheen, slight effervescence											
	12/13/2016	685	1.0	<1	<0.5	1.01	<0.2	<5	<5		0.52	-142.9	2.2	78.3	62.8	2.94			99.4	<5	<5	6.69	10.4	Slightly turbid with suspended particles, grayish tint, injection fluid odor, no sheen	0.00	0.00	0.0	0.00	0.00	0.01	0.00	0.00	1.00	0.00	0.00
RO-IW09D	2/26/2014	-145	2,593	<1.01	<0.500	363	2,230						1.8			2.9			33.9				27.8		0.00	0.00	3.7	36		39	0.00	0.00	0.09	0.91	
RO-IW10S	2/26/2014	-336	543	17.3	7.66	513	4.82						1.2			41.7			15.6				48.9		0.10	0.06	5.3	0.08		5.5	0.02	0.01	0.96	0.01	
RO-IW10D	2/26/2014	-145	1,929	<1.01	<0.500	169	1,760						1.6			1.2			7.43				31.1		0.00	0.00	1.7	28		30	0.00	0.00	0.06	0.94	
RO-IW11S	3/3/2014	-331	536	1.88	21.4	510	2.50						0.0			11.2			17.2				43.9		0.01	0.16	5.3	0.04		5.5	0.00	0.03	0.96	0.01	
RO-IW11D	2/26/2014	-145	593	<1.00	<0.500	7.80	585						2.0			0.4			4.93				32.2		0.00	0.00	0.08	9.36		9.4	0.00	0.00	0.01	0.99	
MW-9S	5/14/2014	-259	1,210	11.8	162	1,000	36.4	<5	<5	ND	0.19	-116.1	2.0			39.9	<0.5	1.32	49.8	<5	<5	8.76	44.6	Clear, low turb, no odor/no sheen, effervescent	0.07	1.2	10	0.58	0.00	12	0.01	0.10	0.85	0.05	0.00
	5/15/2015	107	1,127	114	35.1	566	412				0.09	-233.3	2.0	6.83	7.01	41.8	<0.5		43.1	<5	<5	6.65	30.3	Clear, colorless, no sheen, organic decay odor, effervescent	0.69	0.3	6	6.59		13	0.05	0.02	0.44	0.49	
	9/30/2015	245	1,230	130	84.1	856	160	34.7	25.4	<5	0.67	-15.9	4.0	9.03	7.35	23.6	<0.5	1.83	22.7	<5	<5	7.02	30.1	Clear, yellowish, no sheen, slight diesel-like odor	0.78	0.6	9	2.56	2.24	13	0.05	0.04	0.59	0.17	0.15
	1/4/2016	341	1,394	54.8	37.8	835	466	20.1	8.13	ND	0.26	-122.4	1.6	13.2	13.7	27.5	<0.500	2.05	16.9	<5.00	<5.00	6.86	24.4	Clear, slight yellow color, no sheen, slight petroleum-like odor	0.33	0.3	9	7.46	1.06	17	0.02	0.02	0.49	0.42	0.06
	5/11/2016	469	1,235	55.5	48.5	313	818	<5	<5	<5	0.12	-136.7	2.0	12	10.8	15.4	<0.5	3.18	18.4	<5	<5	6.53	21.8	Clear, colorless, no odor, no sheen	0.33	0.4	3	13.09	0.00	17	0.02	0.02	0.19	0.77	0.00
	12/12/2016	684	984	42.5	56.5	467	418				2.68	-40.9	2.6							<5	<5	5.48	14.9	Clear, colorless, no odor, no sheen	0.26	0.4	5	6.69	0.00	12	0.02	0.04	0.40	0.55	0.00

TABLE 4.1
GROUNDWATER DATA SUMMARY
MAIN SOURCE AREA
CASCADE COLUMBIA/FOX AVENUE

			Volatile Organic Compounds								Aquifer Redox Conditions								Donor Indicators				Other		VOCs- micromoles/Liter(b)						VOCs - Molar Fraction (d)				
Well	Date	Elapsed Time From Injection (days) (a)	Sum CVOCs (c) (µg/L)	PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Iron (T) (mg/L)	Iron (D) (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (mg/L)	TOC (mg/L)	Acetone (µg/L)	MEK (µg/L)	pH	Temp (deg C)	Comments	PCE	TCE	cDCE	VC	Ethene/ Ethane	Total Chloroethenes (c)	PCE	TCE	cDCE	VC	Ethene/Ethane
MW-10D (75 ft DG)	5/14/2014	-68	7,794	<1	<0.5	7,520	274	17.1	<5	ND	0.00	-86.2	1.8			<0.3	<0.5	2.17	45.8	9.27	<5	6.48	30.8	Slight amber color, low turb, no odor/no sheen, effervescent	0.00	0.00	78	4.4	0.66	82	0.00	0.00	0.94	0.05	0.01
	10/22/2014	93	8,308	5.5	2.46	6,670	1,630				0.32	-131.7	2.6	4.58	3.43	<1.50	<0.5		20.0	<5	<5	6.58	41.3	Clear, low turbidity, egg like odor, no sheen, effervescent	0.03	0.02	69	26		95	0.00	0.00	0.72	0.27	
	1/9/2015	172	5,636	5.03	1.21	4,190	1,440	37	<5	ND	0.43	-104.7	3.6	8.65	7.96	<1.50	<0.5	1.42	21.6	<5	<5	6.27	39.6	Slight sulfur like odor	0.03	0.01	43	23	1.4	66	0.00	0.00	0.64	0.34	0.02
	5/15/2015	298	2,032	2.89	<0.5	1,560	469				0.15	-188.4	4.2	10.8	10.7	<1.5	<0.5		21	<5	<5	6.41	37.1	Slightly turbid, colorless, no sheen, rotten egg-like odor	0.02	0.00	16	8		24	0.00	0.00	0.68	0.32	
	9/30/2015	436	915	1.57	<0.5	131	782	38.3	25.8	<5	0.12	-85.4	4.8	12.4	11.6	1.52	<0.5	2.03	9.48	<5	24	6.18	29.6	Clear, colorless, no sheen, slight diesel-like odor, slight effervescence	0.01	0.00	1	13	2.4	14	0.00	0.00	0.08	0.77	0.15
	1/4/2016	532	1,355	1.34	<0.500	34.0	1320	28.4	10.5	ND	0.13	-73.2	0.8	9.49	8.79	7.40	<0.500	3.32	7.56	<5.00	<5.00	6.07	21.6	Clear, colorless, no sheen, slight petroleum-like odor	0.01	0.00	0	21	1.5	21	0.00	0.00	0.02	0.92	0.06
	5/11/2016	660	107	1.04	0.600	26.6	78.8	<5	<5	<5	0.19	-121.9	1.8	6.61	6.5	44.4	<0.5	3.97	12.9	<5	<5	6.16	27.5	Clear, colorless, some black suspended solids, no sheen, slight effervescence	0.01	0.00	0	1	0.0	2	0.00	0.00	0.18	0.82	0.00
	12/12/2016	875	ND	<1	<0.5	<1	<0.2				2.42	-179.8	2.0							28.8	<5	6.48	17.7	Clear with some suspended particles, colorless, no odor, no sheen											
MW-15D (between IW)	5/14/2014	-68	967	150	118	578	121	<5	<5	ND	0.03	-93.8	0.0			7.35	<0.5	1.63	12.8	<5	<5	7.12	30.7	Clear, low turb, no odor/no sheen, effervescent	0.90	0.90	6.0	1.9	0.00	9.7	0.09	0.09	0.61	0.20	0.00
	10/23/2014	94	927	1.28	<0.5	<1	926				0.28	-159.3	5.4	13.8	13	<3	<0.5		2.31	646	880	6.58	25.3	Clear, low turbidity, vomit odor, no sheen, effervescent	0.01	0.00	0.00	15		15	0.00	0.00	0.00	1.00	
	1/8/2015	171	6,514	1.24	<0.5	2.64	6,510	875	23.9	ND	2.41	-126.9	3.0	18.5	17.1	<3	0.800	2.60	359	779	647	6.63	20.3	Amber (initially) to gray, low, slight vomit odor, no sheen, effervescent	0.01	0.00	0.03	104	34	104	0.00	0.00	0.00	0.75	0.25
	5/14/2015	297	24	<1	<0.5	<1	23.8				1.68	-118.3	1.8	17.6	16.8	<60	6.8		222	616	235	9.16	18.3	Slightly turbid, yellow, no sheen, very effervescent, organic odor	0.00	0.00	0.00	0		0	0.00	0.00	0.00	1.00	
	9/29/2015	435	0.41	<1	<0.5	<1	0.405	56.8	66.7	<5	0.95	-169.3	2.6	15.1	16.4	1.05	<0.5	4.75	157	526	160	6.91	15.3	Lightly turbid, colorless at first then turned yellow and black (preservative dependent), no sheen, slight diesel-like odor, very effervescent	0.00	0.00	0.00	0	5	0	0.00	0.00	0.00	0.0014	1.00
	1/4/2016	532	3.6	<1.00	<0.500	<1.00	3.55	30.9	71.4	ND	0.45	-124.0	1.0	12.9	12.4	0.543	<1.00	5.93	85.6	60.6	30.9	7.03	14.0	Clear, green to yellow (depending on preserative), no sheen, organic odor, very effervescent	0.00	0.00	0.00	0	4	0	0.00	0.00	0.00	0.01	0.99
	5/10/2016	659	10	<1	<0.5	1.40	8.64	28.1	99.4	<5	0.91	-74.2	1.6	9.55	7.72	0.862	0.6	9.47	64.4	<5	<5	6.06	16.0	Clear, colorless, petroleum-like odor, foamy	0.00	0.00	0.01	0	5	0	0.00	0.00	0.00	0.03	0.97
	12/12/2016	875	18	<1	<0.5	18.2	<0.2	45.9	272		0.37	-263.1	1.8	28.6	21.9	163			101	5,880	<5	6.60	13.0	Clear with suspended particles, grayish/black color, injection fluid odor, no sheen, very effervescent	0.00	0.00	0.19	0	11	0	0.00	0.00	0.02	0.00	0.98
MW-16D (35 ft DG)	5/14/2014	-68	6,840	<1	<0.5	4,600	2,240	86.2	20.1	ND	0.17	-84.3	0.2			43	<0.5	1.760	7.4	<5	<5	9.85	35.9	Clear, low turb, no odor/no sheen, effervescent	0.00	0.00	47	36	4.03	83	0.00	0.00	0.54	0.41	0.05
	10/23/2014	94	2,750	1.42	8.11	1,660	1,080				0.66	-186.7	4.0	76	80.5	102	2.5		16	1,750	<5	5.96	30.2	Pumped out clear but turned gray over time, low-medium turbidity, egg odor, no sheen, effervescent	0.01	0.06	17	17		34	0.00	0.00	0.50	0.50	
	1/8/2015	171	6,681	1.99	8.51	2,460	4,210	71.6	<5	ND	2.17	-122.0		138	107	31	0.800	0.702	1,010	961	1,690	5.98	28.3	Clear, low, slight vomit odor, no sheen	0.01	0.06	25	67	2.8	93	0.00	0.00	0.27	0.70	0.03
	5/13/2015	296	78	<1	<0.5	2.57	75.8				0.12	-173.3	2.4	74.2	35.3	<60	<0.5		472	932	538	6.74	25.7	Clear, colorless, no sheen, decaying organic odor, very effervescent	0.00	0.00	0	1		1.2	0.00	0.00	0.02	0.98	
	9/28/2015	434	1.7	<1	<0.5	1.37	0.328	37.9	51.8	<5	0.09	-21.5	3.6	73.9	67.6	1.14	<0.5	2.72	37.3	209	185	6.7	23.6	Clear, colorless, no sheen, slight organic odor, no sheen, slightly effervescent	0.00	0.00	0	0	3.3	0.0	0.00	0.00	0.004	0.002	0.99
	1/4/2016	532	0.57	<1.00	<0.500	<1.00	0.570	<5	37.5	ND	0.15	-103.9	2.4	61.4	58.5	<0.600	<0.500	4.25	8.53	14.4	<5.00	6.18	17.2	Clear, colorless, slight petroleum-like odor, no sheen, effervescent	0.00	0.00	0	0	1.3	0.0	0.00	0.00	0.000	0.007	0.99
	5/10/2016	659	ND	<1	<0.5	<1	<0.2	<5	<5	<5	0.22	-87.9	2.0	40.9	37.8	0.285	<0.5	6.92	4.35	<5	<5	6.23	17.9	Clear, colorless, no sheen, slight rotten egg-like odor, slight effervescence											
	12/13/2016	876	18	8.39	2.86	6.84	<0.2	<5	15.2		1.08	-150.9	2.6	29.9	27.3	2.59			43.7	<5	<5	6.53	15.3	Clear, colorless, injection fluid odor, no sheen, slight effervescence	0.05	0.02	0	0	0.5	0.1	0.07	0.03	0.103	0.000	0.79
MW-17D (35 ft DG)	5/14/2014	-68	124	<1	0.738	69.3	53.5	6.11	<5	ND	0.19	-79.8	0.6			0.823	<0.5	3.29	40.9	<5	<5	9.79	42.5	Clear, low turb, no odor/no sheen, effervescent	0.00	0.01	0.71	0.86	0.23	1.6	0.00	0.00	0.39	0.47	0.13
	10/23/2014	94	21	<1	<0.5	3.99	17.4				0.29	-144.2	2.2	0.992	0.711	<1.50	<0.5		17.5	<5	<5	6.92	34.8	Clear to very slight yellow, low turbidity, slight egg odor, no sheen, effervescent	0.00	0.00	0.04	0.28		0.32	0.00	0.00	0.13	0.87	
	1/8/2015	171	25	<1	<0.5	2.75	21.8	<5	<5	ND	0.65	-170.2	4.2	1.15	1.02	<1.50	0.800	3.31	21.2	<5	<5	6.88	33.0	Clear, low, very slight sulfur odor, NS, effervescent	0.00	0.00	0.03	0.35	0.00	0.38	0.00	0.00	0.08	0.92	0.00
	5/15/2015	298	7.1	<1	<0.5	1.11	6.01				0.08	-229.1	2.4	1.86	2.19	<1.5	1.60		21	<5	<5	7.03	31.1	Slightly turbid, yellow, no sheen, effervescent, organic odor	0.00	0.00	0.01	0.10		0.11	0.00	0.00	0.11	0.89	
	9/29/2015	435	2.6	<1	<0.5	<1	2.56	<5	24.4	<5	0.28	-138.2	1.8	2.25	1.90	0.908	<0.5	3.72	10.9	<5	<5	6.97	29.3	Slightly turbid, colorless to yellow in air, no sheen, slight egg-like odor, slight effervescence	0.00	0.00	0.00	0.04	0.87	0.04	0.00	0.00	0.00	0.04	0.96
	1/5/2016	533	0.78	<1.00	<0.500	<1.00	0.780	<5	104	ND	0.07	-127.0	1.6	12.7	12.5	<0.600	<0.500	2.57	42.7	<5.00	<5.00	6.42	25.0	Clear, yellow, no sheen, organic odor, effervescent	0.00	0.00	0.00	0.01	3.71	0.01	0.00	0.00	0.00	0.00	1.00
	5/11/2016	660	2.1	<1	<0.5	<1	2.13	<5	45.1	<5	0.11	-107.5	3.4	19.1	18.7	<1.5	<0.5	4.39	49.7	<5	<5	6.5	26.7	Greenish yellow, clear, no sheen, organic odor, effervescent	0.00	0.00	0.00	0.03	1.61	0.03	0.00	0.00	0.00	0.02	0.98
	12/13/2016	876	ND	<1	<0.5	<1	<0.2	<5	38.1		0.47	-141.7	1.2	23	20.6	14.7			121	<5	<5	6.94	17.1	Clear, yellow tint, injection fluid odor, no sheen, foamy											
MW-18S (between IW's)	5/15/2014	-258	912	145	50.1	712	4.71	<5	<5	ND	0.00	47.3	0.0			239	<0.5	0.271	89.2	29.3	<5	7.05	47.0	Slightly cloudy, low turb, no odor/no sheen, effervescent	0.87	0.38	7.3	0.08	0.00	8.7	0.10	0.04	0.85	0.01	0.00
	10/22/2014	-98	1,952	17.7	23.2	1,870	41.4				0.20	-200.4								<5	<5	6.99	39.0	Slight amber color, low turbidity, slight egg odor, NS, effervescent	0.11	0.18	19	0.66		20	0.01	0.01	0.95	0.03	
	5/14/2015	106	208	1.4	0.74	82.8	123				0.16	-203.3	1.2	1.45	1.51	158	3.60		154	14.1	<5	5.96	28.7	Clear, slightly yellow, effervescent, organic odor, no sheen	0.01	0.01	1	1.97		3	0.00	0.00	0.30	0.69	
	9/28/2015	243	119	3.19	1.1	48.5	66	25.6	25.8	<5	0.07	-28.4	3.0	3.53	3.33	361	<0.5	2.51	125	5.36	<5	7.20	25.5	Clear, yellowish, slight diesel-like odor, no sheen, slightly effervescent	0.02	0.01	1	1.06	1.90	2	0.01	0.00	0.14	0.30	0.55
	1/4/2016	341	75	1.96	<0.500	25.3	47.7	<5	7.5	ND	0.32	-134.2	1.6	1.92	2.26	209	<0.500	2.37	82.8	<5.00	<5.00	7.28	19.8	Clear, yellow, slight petroleum-like odor, slight effervescence	0.01	0.00	0	0.76	0.27	1	0.01	0.00	0.20	0.59	0.21
	5/10/2016	468	240	4.29	0.810	26.3	209	<5	<5	<5	0.29	-96.3	1.6	4.87	4.53	152	<0.5	3.59	74.4	<5	<5	6.59	19.7	Clear, colorless, no sheen, slight organic odor, slight effervescence	0.03	0.01	0	3.34	0.00	4	0.01	0.00	0.07	0.92	0.00
	12/13/2016	685	904	3.01	2.82	387	511	<5	<5		0.34	-163.8	1.8	6.26	5.98	207			80.4	<5	<5	7.15	11.9	Clear with suspended particules, brown/yellow tint, rotten odor, no sheen	0.02	0.02	4	8.18	0.00	12	0.00	0.00	0.33	0.67	0.00
B-20AS	6/20/2014	-222	1,394	<1	11.5	1,280	102	21.6	<5	<5	0.13	-101.8	3.0			10.3	<0.5	4.39	36.1	5.69	<5	6.62	39.3	Clear, low turb, no odor, no sheen	0.00	0.09	13	1.6	0.83	15	0.00	0.01	0.84	0.10	0.05
	5/13/2015	105	1,477	<1	5.23	1,410	61.5				0.08	-208.7	2.8	7.51	6.94	25.9	<0.5		39.9	<5	<5	6.86	30.7	Clear, slightly yellow, no sheen, petroleum-like odor	0.00	0.04	15	1.0		16	0.00	0.00	0.93	0.06	
	9/29/2015	244	1,151	<1	<0.5	972	179				0.05	-56.8	3.0	8.21	7.81	21.3	<0.5		31.5	<5	<5	6.88	32.4	Clear, colorless, no sheen, slight diesel-like odor	0.00	0.00	10	2.9		13	0.00	0.00	0.78	0.22	
	1/5/2016	342 (e)	69	<1.00	<0.500	36.5	32.6				0.29	13.8	2.0	14.0	14.9	37.9	<0.500		5.73	<5.00	<5.00	6.05	19.7	Clear, colorless, no odor, no sheen, effervescent	0.00	0.00	0	0.5		1	0.00	0.00	0.42	0.58	
	5/5/2016	463	165	<1	<0.5	93.5	71.5	<5	<5	<5	0.31	-54	6.0	16.8	6.33	44.0	<0.5	1.03	8.08	<5	<5	5.99	23.2		0.00	0.00	1	1.1		2	0.00	0.00	0.46	0.54	
	12/16/2016	688	14	<1	<0.5	3.42	10.7				0.80	4				28.9				<5	<5	5.9	18.7		0.00	0.00	0	0.2		0	0.00	0.00	0.17	0.83	
B-21D	6/20/2014	-31	3.2	<1	<0.5	3.24	<0.2	<5	36.5	<5	0.21	-61.6	2.6			<1.50	<0.5	5.75	9.13	7.06	<5	6.42	33.4	Dark gray, moderately high, fermented sugar water odor, no sheen	0.00	0.00	0.03	0.00	1.3	0.03	0.00	0.00	0.03	0.00	0.97
	5/13/2015	296	290	<1	<0.5	4.06	286				0.53	-111.4	3.0	46	22.7	<1.5	4.8		21.3	<5	<5	6.49	30.9	Clear, turned dark gray, moderate turbifdity, pungent, unbearable smell, no sheen	0.00	0.00	0.04	4.58		4.62	0.00	0.00	0.01	0.99	
	9/29/2015	435	41	<1	<0.5	<1	41.4	77.5	77.1	<5	0.21	-117.4	3.4	30.1	21.8	20.1	<1	2.69	12.3	<5	<5	6.24	32.1	Clear, yellow to gray in oxygen, effervescent, black floating solids, no sheen, diesel-like odor	0.00	0.00	0.00	0.66	5.7	0.66	0.00	0.00	0.00	0.10	0.90
	1/5/2016	533 (e)	50	<1.00	<0.500	<1.00	50.0	36.1	18.9	ND	0.13	-136.5	2.7	19.9	14.4	26.2	<0.500	3.73	9.36	<5.00	<5.00	6.43	24.1	Slight turbidity, gray solids in sample, no sheen, petroleum-like odor	0.00	0.00	0.00	0.80	2.1	0.80	0.00	0.00	0.00	0.28	0.72
	5/5/2016	654	68	<1	<0.5	<1	67.8	128	22.7	<5	0.24	-60	0.5	81.8	11	<1.5	3.00	1.76	16.8	<5	<5	5.77	28.9		0.00	0.00	0.00	1.08	5.7	1.08	0.00	0.00	0.00	0.16	0.84
	12/16/2016	879	38	<1	<0.5	<1	38.4				1.35	27				2.29				27.3	12.8	5.12	18.6		0.00	0.00	0.00	0.61	0.0	0.61	0.00	0.00	0.00	1.00	0.00

TABLE 4.1
GROUNDWATER DATA SUMMARY
MAIN SOURCE AREA
CASCADE COLUMBIA/FOX AVENUE

			Volatile Organic Compounds								Aquifer Redox Conditions								Donor Indicators				Other			VOCs- micromoles/Liter(b)						VOCs - Molar Fraction (d)				
Well	Date	Elapsed Time From Injection (days) (a)	Sum CVOCs (c) (µg/L)	PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	DO (mg/L)	ORP (mV)	Iron II (mg/L)	Iron (T) (mg/L)	Iron (D) (mg/L)	Sulfate (mg/L)	Sulfide (mg/L)	Methane (mg/L)	TOC (mg/L)	Acetone (µg/L)	MEK (µg/L)	pH	Temp (deg C)	Comments	PCE	TCE	cDCE	VC	Ethene/ Ethane	Total Chloroethenes (c)	PCE	TCE	cDCE	VC	Ethene/Ethane
B-45D (75 ft DG)	5/14/2014	-68	2,029	<1	0.830	998	1,030	35.6	10	ND	0.00	-80.9	1.8			26.1	<0.5	1.37	9.36	<5	<5	6.34	34.3	Clear, moderately low turb, no odor/no sheen, effervescent	0.00	0.01	10	16	1.7	27	0.00	0.00	0.36	0.58	0.06
	10/22/2014	93	17,975	1.55	3.03	7,270	10,700				0.32	-140.7	5.6	8.78	7.56	3.35	<0.5		6.1	<5	<5	6.56	31.5	Clear, low turbidity, egg odor, no sheen, effervescent	0.01	0.02	75	171		246	0.00	0.00	0.30	0.70	
	1/9/2015	172	5,092	<1	2.26	1,870	3,220	392	19.9	ND	0.42	-106.4	2.3	8.25	7.25	11.5	<0.5	1.21	7.73	<5	<5	6.57	30.5	Clear, low, slight sulfur odor, no sheen	0.00	0.02	19	52	16	71	0.00	0.00	0.22	0.59	0.18
	5/13/2015	296	3,882	<1	2.05	1,660	2,220				0.34	-142.4	2.4	12.7	11.4	2.21	<0.5		5.43	<5	<5	6.8	28.6	Clear, colorless, no sheen, petroluem-like odor	0.00	0.02	17	36		53	0.00	0.00	0.33	0.67	
	9/30/2015	436	215	1.38	0.53	49	164	75.2	137	<5	0.14	-118.5	3.6	23.9	21.6	2.97	<0.5	3.23	3.87	<5	<5	6.38	27.2	Clear, colorless, no sheen, very slight diesel-like odor, slight effervescence	0.01	0.00	1	3	8	3	0.00	0.00	0.05	0.24	0.71
	1/5/2016	533	68	1.53	<0.500	6.91	59.5	<5	86.2	ND	0.10	-107.0	1.6	38.0	32.9	1.04	<0.500	3.40	3.99	<5.00	<5.00	6.34	24.1	Clear, colorless, no sheen, slight petroleum-like odor, slight effervescence	0.01	0.00	0	1	3	1	0.00	0.00	0.02	0.23	0.75
	5/11/2016	469	5.9	<1	<0.5	<1	5.92	<5	40.3	<5	0.13	-100.4	2.0	49.1	44.3	1.28	<0.5	7.63	5.14	<5	<5	6.25	24.6	Clear, colorless, no odor, no sheen, slight effervescence	0.00	0.00	0	0	1	0	0.00	0.00	0.00	0.06	0.94
	12/12/2016	684	50	2.15	0.654	1.15	45.9				1.16	-121.8	3.8							<5	<5	6.38	19.2	Clear, colorless, no odor, no sheen, slight effervescence	0.01	0.00	0	1	0	1	0.02	0.01	0.02	0.96	0.00
B-49S (60 ft DG)	5/14/2014	-259	630	98.6	42.2	484	5.14	<5	<5	ND	0.21	-82.2	0.4			14.9	<0.5	0.532	11.4	7.89	<5	9.76	32.9	Clear, low turb, no odor/no sheen, effervescent	0.59	0.32	5.0	0.08	0.00	6.0	0.10	0.05	0.83	0.01	0.00
	10/23/2014	-97	1,226	13	26.1	1,170	17.2				0.26	-180.3								<5	<5	6.72	35.5	Clear, low turb, egg odor, no sheen, effervescent	0.08	0.20	12	0.28	0.00	13	0.01	0.02	0.96	0.02	0.00
	5/13/2015	105	855	11.7	8.32	375	460				1.39	-115.1	0.6	10.8	9.93	8.17	<0.5		7.23	<5	<5	6.7	22.5	Clear, low turbidity, fermented sugar water odor, no sheen	0.07	0.06	4	7.36		11	0.01	0.01	0.34	0.65	
	9/30/2015	245	202	17.4	17	132	35.2	24	23.9	<5	0.65	1.6	5.4	7.4	7.23	40.5	<0.5	0.852	12	20	<5	7.14	26.2	Clear, colorless, no sheen, diesel-like odor	0.10	0.13	1	0.56	1.77	2	0.03	0.03	0.35	0.14	0.45
	1/5/2016	342	152	59.2	35.7	55.2	2.38	<5	<5	ND	0.17	76.5	2.0	4.65	4.73	5.80	<0.500	0.498	2.45	<5.00	<5.00	6.70	14.5	Clear, colorless, no sheen, slight petroleum-like odor	0.36	0.27	1	0.04	0.00	1	0.29	0.22	0.46	0.03	0.00
	5/11/2016	469	259	13.7	8.78	113	124	<5	<5	<5	0.17	-70.7	2.0	8.74	8.15	13.8	<0.5	3.12	3.12	<5	<5	6.21	17.9	Colorless, clear, no odor, no sheen	0.08	0.07	1	1.98	0.00	3	0.03	0.02	0.35	0.60	0.00
	12/12/2016	684	172	121	26.6	24.3	<0.2				1.57	-46.2	1.8							<5	<5	5.94	11.6	Slight turbidity, colorless, no odor, no sheen	0.73	0.20	0	0.00	0.00	1	0.62	0.17	0.21	0.00	0.00
B-58S	5/15/2014	-258	458	5.43	3.04	305	145				2.17											6.07	26.0	Sampled by Calibre	0.03	0.02	3.1	2.3		5.5	0.01	0.00	0.57	0.42	
	5/13/2015	105	182	<1	<0.5	120	62				0.42	-182.1	2.4	16.3	17.1	24.5	<0.5		27.4	<5	<5	7.23	19.2	Clear, slighlty yellow, no odor, no sheen	0.00	0.00	1.2	1.0		2.2	0.00	0.00	0.56	0.44	
	9/29/2015	244	131	<1	1.77	78.8	50.2				0.10	-55.9	1.4	12.9	10.9	63.4	<0.5		18	<5	<5	6.80	23.2	Slightly turbid and yellow, no sheen, slight diesel-like odor	0.00	0.01	0.8	0.8		1.6	0.00	0.01	0.50	0.49	
	1/5/2016	342 (e)	261	<1.00	1.78	221	38.4				0.11	-134.6	2.2	9.99	9.92	35.9	<0.500		12.5	<5.00	<5.00	6.49	17.1	Clear, colorless, no sheen, slight petroleum-like odor	0.00	0.01	2.3	0.6		2.9	0.00	0.00	0.78	0.21	
	5/5/2016	463	109	<1	2.30	89.8	16.8				0.55	-94	5.5	21.7	0.232	93.4	<0.5		19.0	5.29	<5	6.50	19.2		0.00	0.02	0.9	0.3		1.2	0.00	0.01	0.76	0.22	
	12/5/2016	677	248	<1	0.577	203	44.0				3.18	-43				74.0				<5	<5	6.37	16.7		0.00	0.00	2.1	0.7		2.8	0.00	0.00	0.75	0.25	
B-59D	5/15/2014	-67	3.3	<1	<0.5	<1	3.29				1.57											5.79	25.1	Sampled by Calibre	0.00	0.00	0.00	0.05		0.05	0.00	0.00	0.00	1.00	
(150 ft DG)	10/22/2014	93	27	<1	<0.5	<1	26.8				0.93	-85.6	4.2	164	156	65.1	<0.5		12	<5	<5	5.78	23.1	Clear, low turbidity, slight egg odor, no sheen, effervescent	0.00	0.00	0.00	0.43		0.43	0.00	0.00	0.00	1.00	
	1/9/2015	172	8.0	<1	<0.5	<1	8.01				2.28	-37.3	2.8	120	110	53.9	<0.5		29.7	<5	<5	5.98	22.6	Slightly cloudy, low-moderate turbidity, slight sulfur odor, no sheen	0.00	0.00	0.00	0.13		0.13	0.00	0.00	0.00	1.00	
	5/13/2015	296	1.1	<1	<0.5	<1	1.06				1.54	-83.3	2.4	39.4	39.9	39.5	<0.5		15.9	<5	<5	6.17	21.1	Clear, colorless, rotten egg-like odor, no sheen, effervescent	0.00	0.00	0.00	0.02		0.02	0.00	0.00	0.00	1.00	
	9/29/2015	435	3.3	<1	<0.5	<1	3.29	20.1	27.6	<5	0.48	-91.2	3.6	183	174	97.3	<0.5	3.4	5.25	<5	<5	5.76	22.7	Clear, colorless, no sheen, slight diesel-like odor, slightly effervescent	0.00	0.00	0.00	0.05	1.76	0.05	0.00	0.00	0.00	0.03	0.97
	1/5/2016	533 (e)	3.6	<1.00	<0.500	<1.00	3.57	6.64	7.51	ND	0.30	-1.6	2.2	115	114	87.6	<0.500	4.65	8.49	<5.00	<5.00	6.58	20.0	Clear, colorless, no sheen, effervescent	0.00	0.00	0.00	0.06	0.52	0.06	0.00	0.00	0.00	0.10	0.90
	5/5/2016	654	19	<1	<0.5	<1	18.6	<5	<5	<5	4	-46	6.0	38.7	0.11	12.3	<0.5	4.90	3.24	<5	<5	5.81	21.2		0.00	0.00	0.00	0.30	0.00	0.30	0.00	0.00	0.00	1.00	0.00
B-60S (145 ft DG)	5/15/2014	-258	1,556	<1	3.51	1,500	52.0				1.09											6.13	33.6	Sampled by Calibre	0.00	0.03	15	0.83		16	0.00	0.00	0.95	0.05	
	6/20/2014	-222						<5	<5	<5	0.21	-87.3	2.4			24.0	<0.5	6.20	9.53			6.66	34.6	Slight amber color, low turb, smells bad, no sheen					0.00						
	5/13/2015	105	720	2.11	22.6	648	47.6				0.85	-91.3	1.8	8.8	9	19.5	<0.5		16.4	<5	<5	6.70	23.3	Clear, very slight yellow, petroleum-like odor, no sheen, effervescent	0.01	0.17	7	0.76		8	0.00	0.02	0.88	0.10	
	9/30/2015	245	610	<1	12.7	463	134				0.57	-12.3	2.0	12.1	10.4	16.1	<0.5		8.84	<5	<5	7.24	25.6	Clear, colorless, no sheen, strong diesel-like odor	0.00	0.10	5	2.14		7	0.00	0.01	0.68	0.31	
	1/5/2016	342 (e)	615	<1.00	1.51	367	246				0.10	-122.4	1.6	16.1	16.3	11.1	<0.500		16.6	<5.00	<5.00	6.42	19.1	Clear, colorless, slight effervescence, strong petroleum-like odor, no sheen	0.00	0.01	4	3.94		8	0.00	0.00	0.49	0.51	
	5/5/2016	463	182	<1	<0.5	104	78.2	<5	7.79	<5	0.31	-100	6.5	17.5	2.1	29.5	<0.5	1.72	17.3	<5	<5	6.10	19.3		0.00	0.00	1	1.25		2	0.00	0.00	0.46	0.54	
	12/5/2016	677	8	<1	<0.5	<1	7.8				3.45	-15				13.6				<5	<5	6.26	15.9		0.00	0.00	0	0.12		0	0.00	0.00	0.00	1.00	
B-61D (145 ft DG)	5/15/2014	-67	33	<1	<0.5	15.8	17.4				1.13											5.99	31.3	Sampled by Calibre	0.00	0.00	0.16	0.28		0.44	0.00	0.00	0.37	0.63	
	6/20/2014	-31						<5	26.3	<5	0.44	-57.5	2.0			<0.3	<0.5	11.6	4.05			6.36	27.0	Clear, low turb, no odor, no sheen, effervescent											
	10/22/2014	93	12	<1	<0.5	9.64	2.77				0.41	-96.0	4.5	40.7	38.3	<3	<0.5		9.07	7.29	<5	6.30	29.2	Clear, low turbidity, slight egg odor, no sheen, effervescent	0.00	0.00	0.10	0.04		0.14	0.00	0.00	0.69	0.31	
	1/9/2015	172	9	<1	<0.5	6.92	1.69				1.60	-77.9	2.4	37.7	40.3	<3	0.800		21.90	<5	<5	6.14	26.1	Slightly cloudy, low to moderate turbidity, slight vomit-like odor, no sheen	0.00	0.00	0.07	0.03		0.10	0.00	0.00	0.73	0.27	
	5/13/2015	296	802	<1	<0.5	165	637				0.13	-143.5	2.6	38.8	38.3	39.5	<0.5		13.4	<5	<5	6.39	27.6	Clear, low turbidity, vomit-like odor, no sheen	0.00	0.00	1.70	10.19		11.89	0.00	0.00	0.14	0.86	
	9/30/2015	436	1,564	<1	0.82	463	1,100	47.5	71.5	<5	0.23	-90.9	5.0	45.0	40.5	111	<0.5	3.24	6.45	<5	<5	6.09	26.2	Clear, colorless, very slight diesel-like odor, no sheen	0.00	0.01	4.78	17.60	4.37	22.38	0.00	0.00	0.18	0.66	0.16
	1/5/2016	533 (e)	3,875	<1.00	1.45	644	3230	53.7	129	ND	0.18	-95.2	1.4	27.1	27.5	63.0	<0.500	3.97	6.26	<5.00	<5.00	6.79	23.5	Clear, colorless, no sheen, slight petroleum-like odor	0.00	0.01	6.64	51.68	6.66	58.34	0.00	0.00	0.10	0.80	0.10
	5/5/2016	654	105	<1	<0.5	21.1	84.0	12.7	49.3	<5	0.21	-70	7.0	58.6	40.4	4.63	<0.5	2.61	6.44	<5	<5	5.88	24.6	Effervescent	0.00	0.00	0.22	1.34	2.25	1.56	0.00	0.00	0.06	0.35	0.59
	12/5/2016	868	41	<1	0.561	4.16	35.8				1.28	-20				7.75				<5	<5	6.11	19.4		0.00	0.00	0.04	0.57	0.00	0.62	0.00	0.01	0.07	0.92	0.00

PCE = Tetrachloroethene
TCE = Trichloroethene
cDCE = cis-1,2-Dichloroethene
VC = Vinyl Chloride
MEK = Methyl ethyl ketone

ORP = Oxidation Reduction Potential
TOC = Total Organic Carbon
DO = Dissolved Oxygen
Iron (T) = Total Iron
Iron (D) = Dissolved Iron

deg C = degrees Celcius
mV = millivolts
mg/L = milligrams per Liter
µg/L = micrograms per Liter

IW = Injection Well
S = Shallow
D = Deep
not analyzed or measured
predominant PCE or breakdown products molar fraction

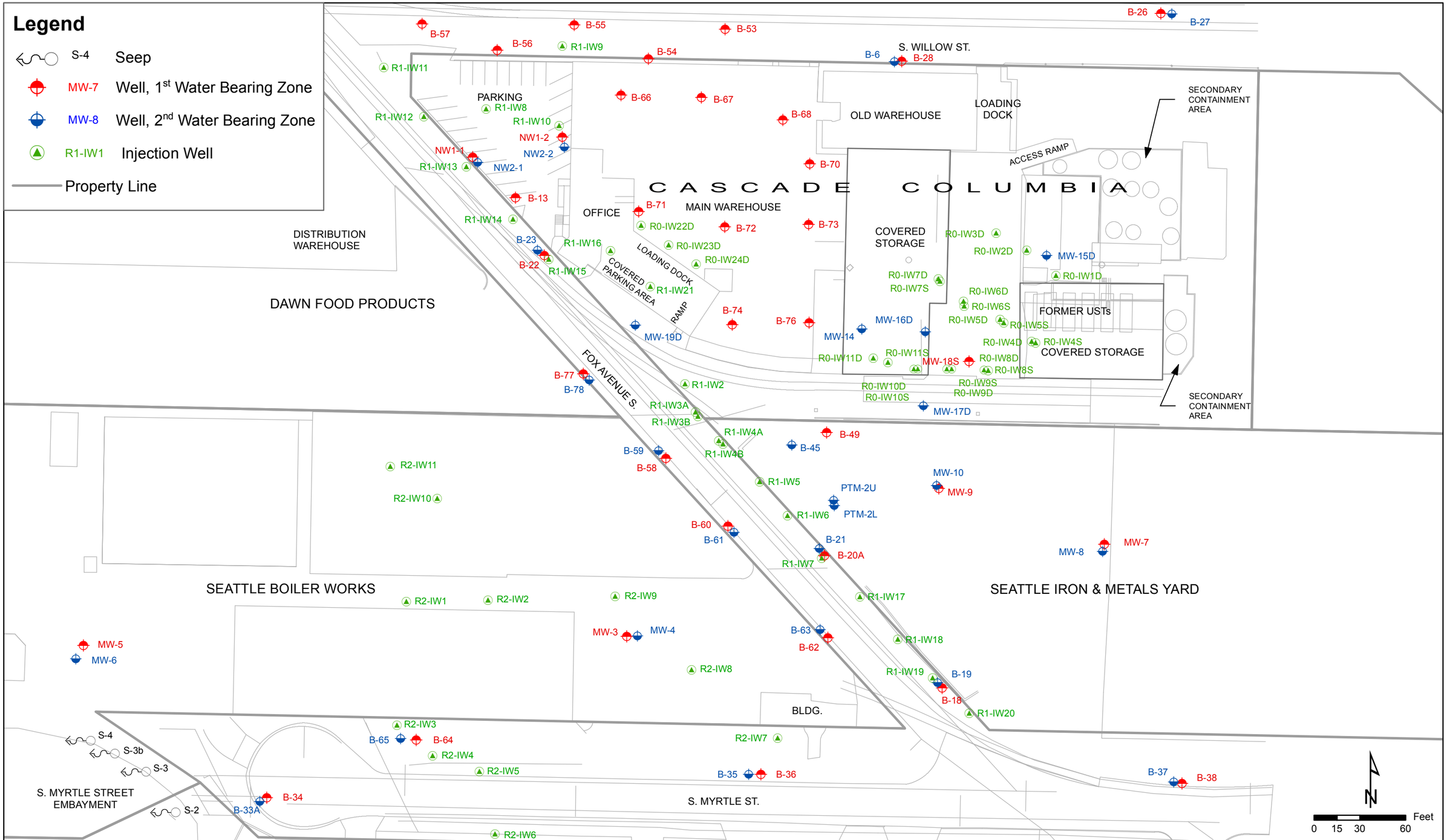
(a) Elapsed time for shallow and deep wells is relative to the January 2015 WBZ#1 source area injection and the July 2014 WBZ#2 source area injection, respectively.
(b) Calculated by dividing the concentration in groundwater by the molecular weight of the compound. Reporting limits for non-detect results replaced with zero.
(c) Sum of PCE, TCE, cDCE, and VC.
(d) Indicates the fraction of total ethenes (PCE+TCE+cDCE+VC+ethene/ethane) due to each individual compound on a molar basis.
(e) Follows November 2015 injection of sugar substrate by Calibre to upgradient or adjacent Fox Avenue injection wells (R1-IW3a, R1-IW4a, R1-IW4b, R1-IW5, R1-IW6, R1-IW7).

Dates for Elapsed Time
7/21/2014 1st injection to WBZ#2
1/28/2015 1st injection to WBZ#1

Fox Avenue Site
Seattle, Washington

2016 Annual Report

Figures



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2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 1.1
Site Plan

I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 1.1 Site Plan.mxd
2/17/2017

Legend

Conc. in µg/L

- 0–1
- 1–10
- 10–100
- 100–1,000
- Property Line

Notes:
- Thermal treatment period from January–May 2013.
- Total CVOCs include tetrachlorethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (cis-DCE).
- Data shown are from May or December 2016 sampling events. For wells that were sampled in both events, only December data are shown.

Abbreviations:
- CVOC = Chlorinated volatile organic compound
- µg/L = Micrograms per liter
- UST = Underground Storage Tank

Qualifier:
- U = The analyte was not detected greater than or equal to the concentration reported.

N

0 50 100

Scale in Feet

S. WILLOW ST.

R1-IW12 *1.00 U*

PARKING

R1-IW10 *1.00 U*

NW 1-1 *1.00 U*

OLD WAREHOUSE

LOADING DOCK

SECONDARY CONTAINMENT AREA

ACCESS RAMP

C A S C A D E C O L U M B I A

MAIN WAREHOUSE

OFFICE

DISTRIBUTION WAREHOUSE

B-22 *81.0*

LOADING DOCK

COVERED PARKING AREA

RAMP

COVERED STORAGE

DAWN FOOD PRODUCTS

FORMER USTs

COVERED STORAGE

R0-IW9S *1.00 U*

MW-18S *5.83*

B-77 *1.72*

FOX AVENUE S.

R1-IW3A *0.530*

R1-IW4A *1.00 U*

B-49 *148*

SECONDARY CONTAINMENT AREA

B-58 *0.577*

R1-IW5 *1.00 U*

MW-09 *99.0*

R2-IW10 *1.00 U*

B-60 *1.00 U*

MW-07 *103*

R1-IW7 *1.00 U*

B-20A *1.00 U*

R1-IW17 *1.00 U*

SEATTLE BOILER WORKS

R2-IW1 *2.04*

R2-IW2 *0.890*

R2-IW9 *1.00 U*

SEATTLE IRON & METALS YARD

MW-05 *7.88*

MW-03 *1.00 U*

B-62 *1.00 U*

B-18 *1.00 U*

R2-IW3 *1.00 U*

B-64 *1.00 U*

BLDG.

S. MYRTLE STREET EMBAYMENT

S. MYRTLE ST.

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2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 4.1
PCE + TCE Concentrations in Groundwater
1st Water Bearing Zone

File: I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 4.1 PCE_TCE WBZ1.mxd
Date: 2/17/2017

Legend

Conc. in µg/L

- 0–1
- 1–10
- 10–100
- Property Line

Notes:
- Thermal treatment period from January–May 2013.
- Total CVOCs include tetrachlorethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (cis-DCE).
- Data shown are from May or December 2016 sampling events. For wells that were sampled in both events, only December data are shown.

Abbreviations:
- CVOC = Chlorinated volatile organic compound
- µg/L = Micrograms per liter
- UST = Underground Storage Tank

Qualifier:
- U = The analyte was not detected greater than or equal to the concentration reported.

N

0 50 100

Scale in Feet

S. WILLOW ST.

PARKING

OLD WAREHOUSE

LOADING DOCK

SECONDARY CONTAINMENT AREA

ACCESS RAMP

C A S C A D E C O L U M B I A

MAIN WAREHOUSE

OFFICE

COVERED STORAGE

R0-IW2D 1.38

MW-15D 1.00 U

DISTRIBUTION WAREHOUSE

R1-IW15 1.00 U

LOADING DOCK

COVERED PARKING AREA

RAMP

R0-IW6D 3.49

FORMER USTs

DAWN FOOD PRODUCTS

MW-16D 11.2

COVERED STORAGE

FOX AVENUE S.

B-78 1.00 U

R1-IW2 1.00 U

MW-17D 1.00 U

SECONDARY CONTAINMENT AREA

B-59 1.00 U

R1-IW4B 1.00 U

B-45 2.80

R1-IW5 1.00 U

MW-10 0.732

B-61 0.561

B-21 1.00 U

MW-08 1.00 U

SEATTLE BOILER WORKS

R2-IW1 2.13

R2-IW2 0.890

R1-IW7 1.00 U

R1-IW17 1.00 U

SEATTLE IRON & METALS YARD

MW-04 1.00 U

B-63 1.00 U

MW-06 28.4

R2-IW8 1.00 U

B-19 1.00 U

R2-IW3 1.00 U

BLDG.

R2-IW4 1.00 U

B-65 1.00 U

B-35 1.00 U

S. MYRTLE STREET EMBAYMENT

B-33A 1.00 U

S. MYRTLE ST.

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2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 4.2
PCE + TCE Concentrations in Groundwater
2nd Water Bearing Zone

File: I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 4.2 PCE_TCE WBZ2.mxd
Date: 2/17/2017

Legend

Conc. in µg/L

- 0–1
- 1–10
- 10–100
- 100–1,000
- Property Line

Notes:
- Thermal treatment period from January–May 2013.
- Total CVOCs include tetrachlorethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (cis-DCE).
- Data shown are from May or December 2016 sampling events. For wells that were sampled in both events, only December data are shown.

Abbreviations:
- CVOC = Chlorinated volatile organic compound
- µg/L = Micrograms per liter
- UST = Underground Storage Tank

Qualifier:
- U = The analyte was not detected greater than or equal to the concentration reported.

N

0 50 100

Scale in Feet

S. WILLOW ST.

R1-IW12 *34.2*

PARKING

R1-IW10 *5.78*

NW 1-1 *143*

OLD WAREHOUSE

LOADING DOCK

SECONDARY CONTAINMENT AREA

ACCESS RAMP

C A S C A D E C O L U M B I A

MAIN WAREHOUSE

OFFICE

DISTRIBUTION WAREHOUSE

B-22 *127*

COVERED STORAGE

LOADING DOCK

COVERED PARKING AREA

RAMP

DAWN FOOD PRODUCTS

FORMER USTs

COVERED STORAGE

R0-IW9S *1.01*

MW-18S *898*

B-77 *1.00 U*

FOX AVENUE S.

R1-IW3A *3.69*

R1-IW4A *6.92*

B-49 *24.3*

B-58 *247*

R1-IW5 *29.9*

MW-09 *885*

SECONDARY CONTAINMENT AREA

R2-IW10 *5.88*

B-60 *7.80*

MW-07 *79.0*

B-20A *15.5*

R1-IW7 *14.4*

R1-IW17 *1.25*

SEATTLE BOILER WORKS

R2-IW1 *78.6*

R2-IW2 *8.13*

R2-IW9 *53.8*

SEATTLE IRON & METALS YARD

MW-03 *11.4*

B-62 *1.00 U*

MW-05 *2.44*

B-18 *22.2*

R2-IW3 *13.8*

B-64 *43.5*

BLDG.

S. MYRTLE STREET EMBAYMENT

S. MYRTLE ST.

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2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 4.3
cis-DCE + VC Concentrations in Groundwater
1st Water Bearing Zone

File: I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 4.3 cis_VC WBZ1.mxd
Date: 2/17/2017

Legend

Conc. in µg/L

- 0–1
- 1–10
- 10–100
- Property Line

Notes:
- Thermal treatment period from January–May 2013.
- Total CVOCs include tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (cis-DCE).
- Data shown are from May or December 2016 sampling events. For wells that were sampled in both events, only December data are shown.

Abbreviations:
- CVOC = Chlorinated volatile organic compound
- µg/L = Micrograms per liter
- UST = Underground Storage Tank

Qualifier:
- U = The analyte was not detected greater than or equal to the concentration reported.

N

0 50 100

Scale in Feet

S. WILLOW ST.

PARKING

OLD WAREHOUSE

LOADING DOCK

SECONDARY CONTAINMENT AREA

ACCESS RAMP

C A S C A D E C O L U M B I A

MAIN WAREHOUSE

OFFICE

COVERED STORAGE

DISTRIBUTION WAREHOUSE

R1-IW15 *7.10*

R0-IW2D *41.8*

MW-15D *18.2*

LOADING DOCK

COVERED PARKING AREA

RAMP

R0-IW6D *36.2*

DAWN FOOD PRODUCTS

FORMER USTs

MW-16D *6.84*

COVERED STORAGE

FOX AVENUE S.

B-78 *1.00 U*

R1-IW2 *0.440*

MW-17D *1.00 U*

SECONDARY CONTAINMENT AREA

B-59 *18.6*

R1-IW4B *8.42*

B-45 *47.0*

R1-IW5 *33.9*

MW-10 *38.8*

B-61 *40.0*

B-21 *38.4*

R1-IW7 *13.2*

MW-08 *67.0*

R1-IW17 *1.14*

SEATTLE BOILER WORKS

R2-IW1 *88.5*

R2-IW2 *7.55*

SEATTLE IRON & METALS YARD

MW-04 *0.699*

B-63 *1.41*

MW-06 *92.6*

R2-IW8 *3.92*

B-19 *60.9*

R2-IW3 *10.1*

BLDG.

B-65 *3.42*

R2-IW4 *2.76*

B-35 *1.00 U*

B-33A *15.4*

S. MYRTLE STREET EMBAYMENT

S. MYRTLE ST.

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2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 4.4
cis-DCE + VC Concentrations in Groundwater
2nd Water Bearing Zone

File: I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 4.4 cis_VC WBZ2.mxd
Date: 2/17/2017

Legend
Total CVOCs (µg/L)

- 0–1
- 1–10
- 10–100
- 100–1,000

Notes:
- Thermal treatment period from January–May 2013.
- Total CVOCs include tetrachlorethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (cis-DCE).
- Data shown are from May or December 2016 sampling events. For wells that were sampled in both events, only December data are shown.

Abbreviations:
- CVOC = Chlorinated volatile organic compound
- µg/L = Micrograms per liter
- UST = Underground Storage Tank

Qualifier:
- U = The analyte was not detected greater than or equal to the concentration reported.

N

0 50 100

Scale in Feet

S. WILLOW ST.

R1-IW12 *34.2*

PARKING

R1-IW10 *5.78*

NW 1-1 *143*

OLD WAREHOUSE

LOADING DOCK

SECONDARY CONTAINMENT AREA

ACCESS RAMP

C A S C A D E C O L U M B I A

MAIN WAREHOUSE

OFFICE

DISTRIBUTION WAREHOUSE

B-22 *208*

COVERED STORAGE

LOADING DOCK

COVERED PARKING AREA

RAMP

DAWN FOOD PRODUCTS

FORMER USTs

R0-IW9S *1.01*

MW-18S *904*

COVERED STORAGE

B-77 *1.72*

FOX AVENUE S.

R1-IW3A *4.22*

B-49 *172*

R1-IW4A *6.92*

B-58 *248*

R1-IW5 *29.9*

MW-09 *984*

R2-IW10 *5.88*

B-60 *7.80*

MW-07 *182*

R1-IW7 *14.4*

B-20A *15.5*

R1-IW17 *1.25*

SEATTLE BOILER WORKS

R2-IW1 *80.6*

R2-IW2 *9.02*

R2-IW9 *53.8*

SEATTLE IRON & METALS YARD

MW-05 *10.3*

MW-03 *11.4*

B-62 *1.00 U*

B-18 *22.2*

R2-IW3 *13.8*

B-64 *43.5*

BLDG.

S. MYRTLE STREET EMBAYMENT

S. MYRTLE ST.

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2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 4.5
Total CVOCs Concentrations in Groundwater
1st Water Bearing Zone

File: I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 5.5 Total CVOCs WBZ1.mxd
Date: 2/17/2017

Legend
Total CVOCs (µg/L)

- 0–1
- 1–10
- 10–100
- 100–1,000

Notes:
- Thermal treatment period from January–May 2013.
- Total CVOCs include tetrachlorethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis-1,2-dichloroethene (cis-DCE).
- Data shown are from May or December 2016 sampling events. For wells that were sampled in both events, only December data are shown.

Abbreviations:
- CVOC = Chlorinated volatile organic compound
- µg/L = Micrograms per liter
- UST = Underground Storage Tank

Qualifier:
- U = The analyte was not detected greater than or equal to the concentration reported.

N

0 50 100

Scale in Feet

S. WILLOW ST.

PARKING

OLD WAREHOUSE

LOADING DOCK

SECONDARY CONTAINMENT AREA

ACCESS RAMP

C A S C A D E C O L U M B I A

MAIN WAREHOUSE

OFFICE

DISTRIBUTION WAREHOUSE

COVERED STORAGE

R0-IW2D 43.1

MW-15D 18.2

R1-IW15 7.10

LOADING DOCK

COVERED PARKING AREA

RAMP

R0-IW6D 39.7

DAWN FOOD PRODUCTS

MW-16D 18.1

FORMER USTs

COVERED STORAGE

FOX AVENUE S.

B-78 1.00 U

R1-IW2 0.440

MW-17D 1.00 U

SECONDARY CONTAINMENT AREA

B-59 18.6

R1-IW4B 8.42

B-45 49.9

R1-IW5 33.9

MW-10 39.6

B-61 40.5

B-21 38.4

R1-IW7 13.2

MW-08 67.0

R1-IW17 1.14

SEATTLE BOILER WORKS

R2-IW1 90.6

R2-IW2 8.44

SEATTLE IRON & METALS YARD

B-63 1.41

MW-04 0.699

MW-06 121

R2-IW8 3.92

B-19 60.9

R2-IW3 10.1

BLDG.

B-65 3.42

R2-IW4 2.76

B-35 1.00 U

B-33A 15.4

S. MYRTLE STREET EMBAYMENT

S. MYRTLE ST.

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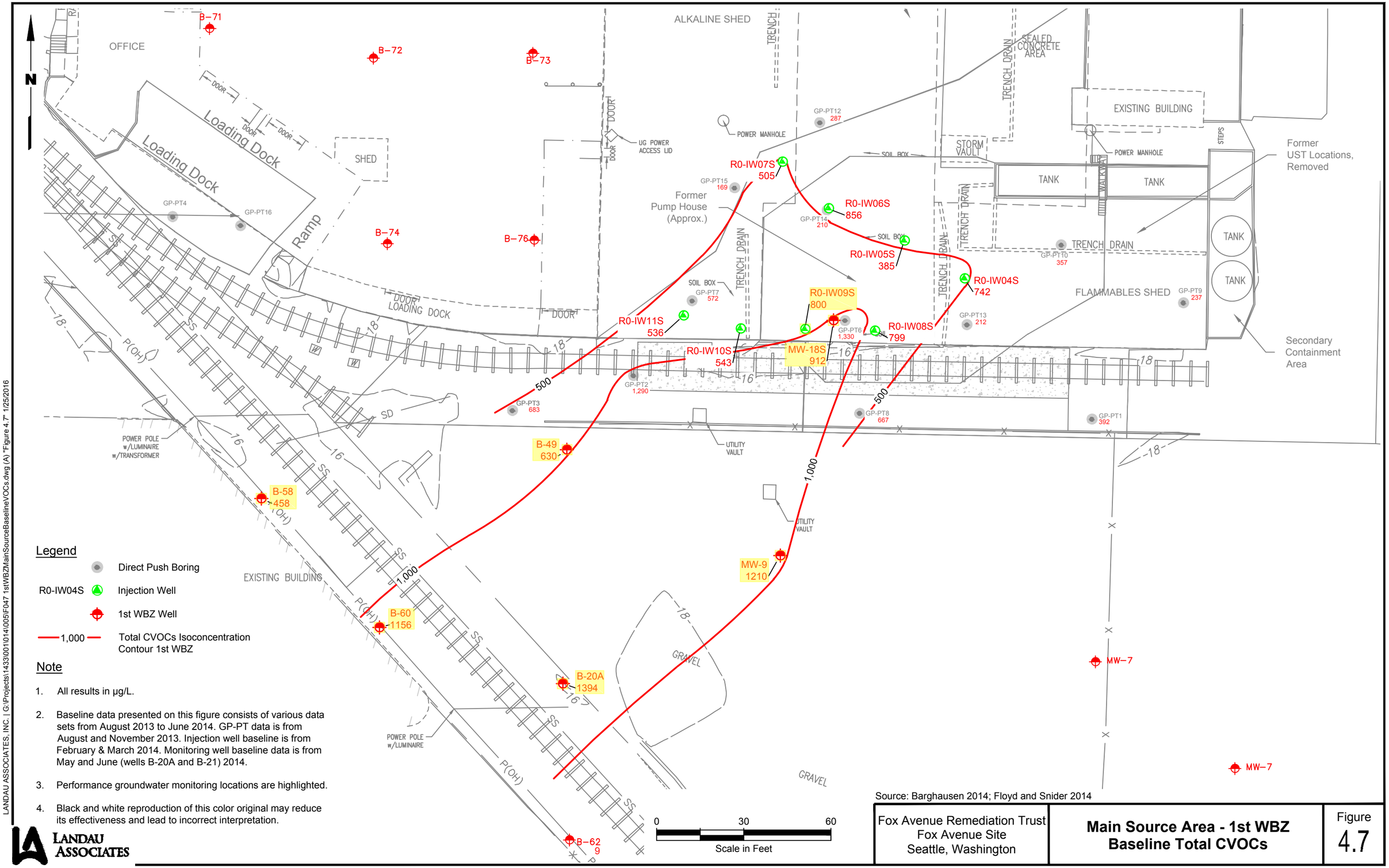
2016 Annual Report
Fox Avenue Site
Seattle, Washington

Figure 4.6
Total CVOCs Concentrations in Groundwater
2nd Water Bearing Zone

File: I:\GIS\Projects\FOXAVE-RA\MXD\2016 Annual Report\Figure 5.6 Total CVOCs WBZ2.mxd
Date: 2/17/2017



Legend

- Direct Push Boring
- R0-IW04S — Injection Well
- 1st WBZ Well
- 1,000 — Total CVOCs Isoconcentration Contour 1st WBZ

Note

1. All results in µg/L.
2. Baseline data presented on this figure consists of various data sets from August 2013 to June 2014. GP-PT data is from August and November 2013. Injection well baseline is from February & March 2014. Monitoring well baseline data is from May and June (wells B-20A and B-21) 2014.
3. Performance groundwater monitoring locations are highlighted.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Barghausen 2014; Floyd and Snider 2014

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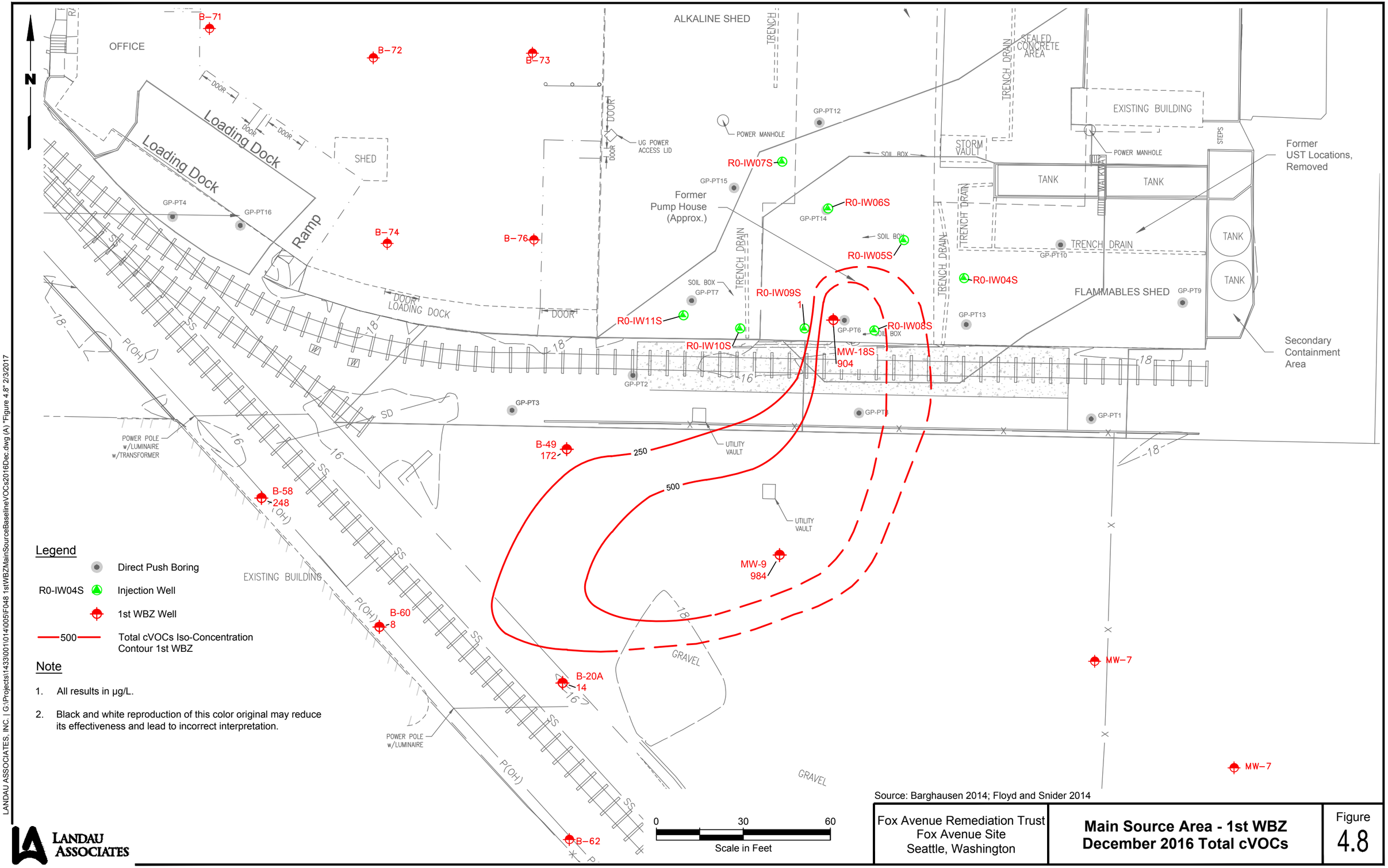
Fox Avenue Remediation Trust Fox Avenue Site Seattle, Washington	**Main Source Area - 1st WBZ Baseline Total CVOCs**	Figure 4.7



Legend

- Direct Push Boring
- R0-IW04S — Injection Well
- 1st WBZ Well
- 500 — Total cVOCs Iso-Concentration Contour 1st WBZ

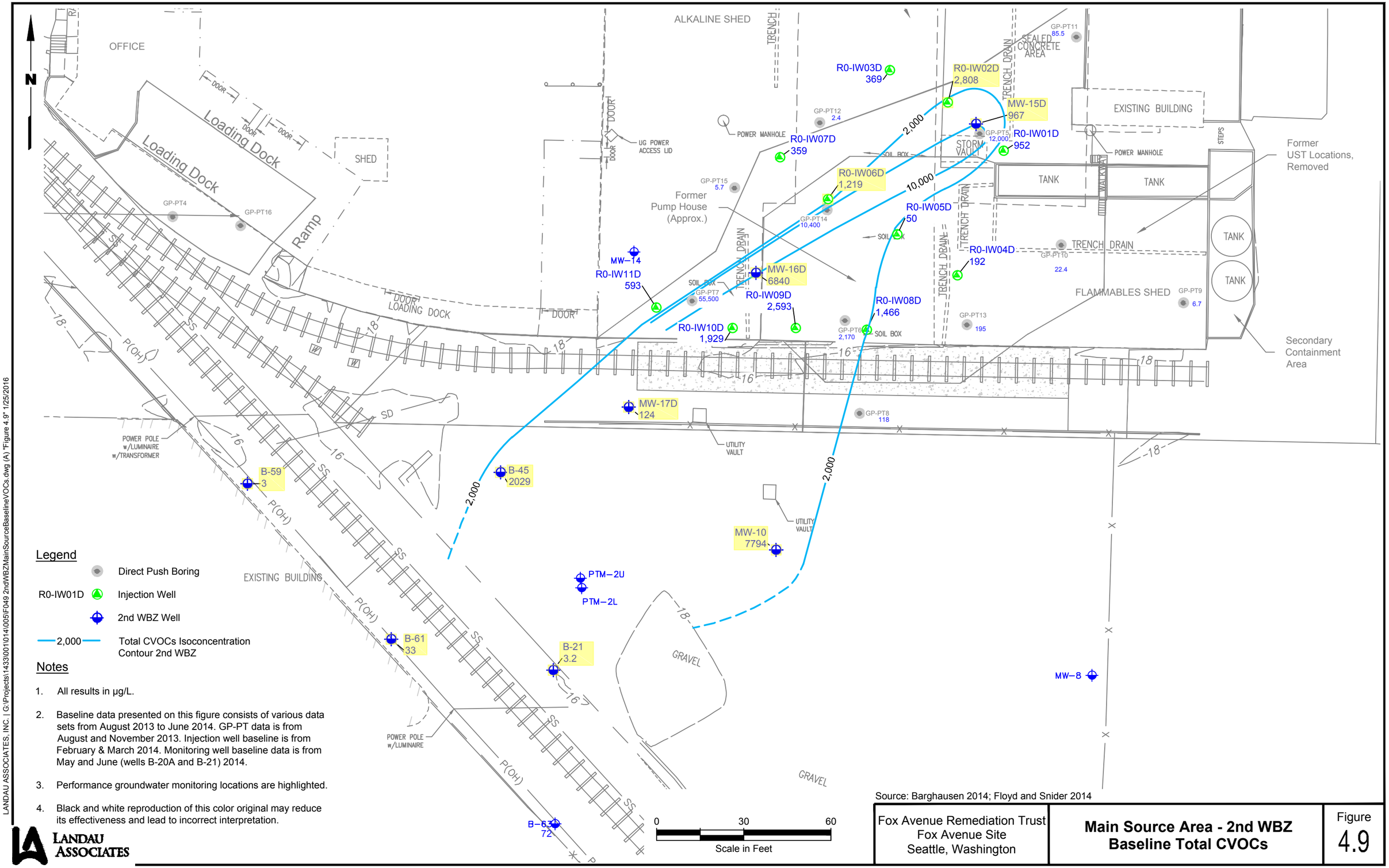
Note

1. All results in µg/L.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Barghausen 2014; Floyd and Snider 2014

LANDAU ASSOCIATES

Fox Avenue Remediation Trust Fox Avenue Site Seattle, Washington	**Main Source Area - 1st WBZ December 2016 Total cVOCs**	Figure 4.8



Legend

- Direct Push Boring
- R0-IW01D — Injection Well
- 2nd WBZ Well
- 2,000 — Total CVOCs Isoconcentration Contour 2nd WBZ

Notes

1. All results in µg/L.
2. Baseline data presented on this figure consists of various data sets from August 2013 to June 2014. GP-PT data is from August and November 2013. Injection well baseline is from February & March 2014. Monitoring well baseline data is from May and June (wells B-20A and B-21) 2014.
3. Performance groundwater monitoring locations are highlighted.
4. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Barghausen 2014; Floyd and Snider 2014

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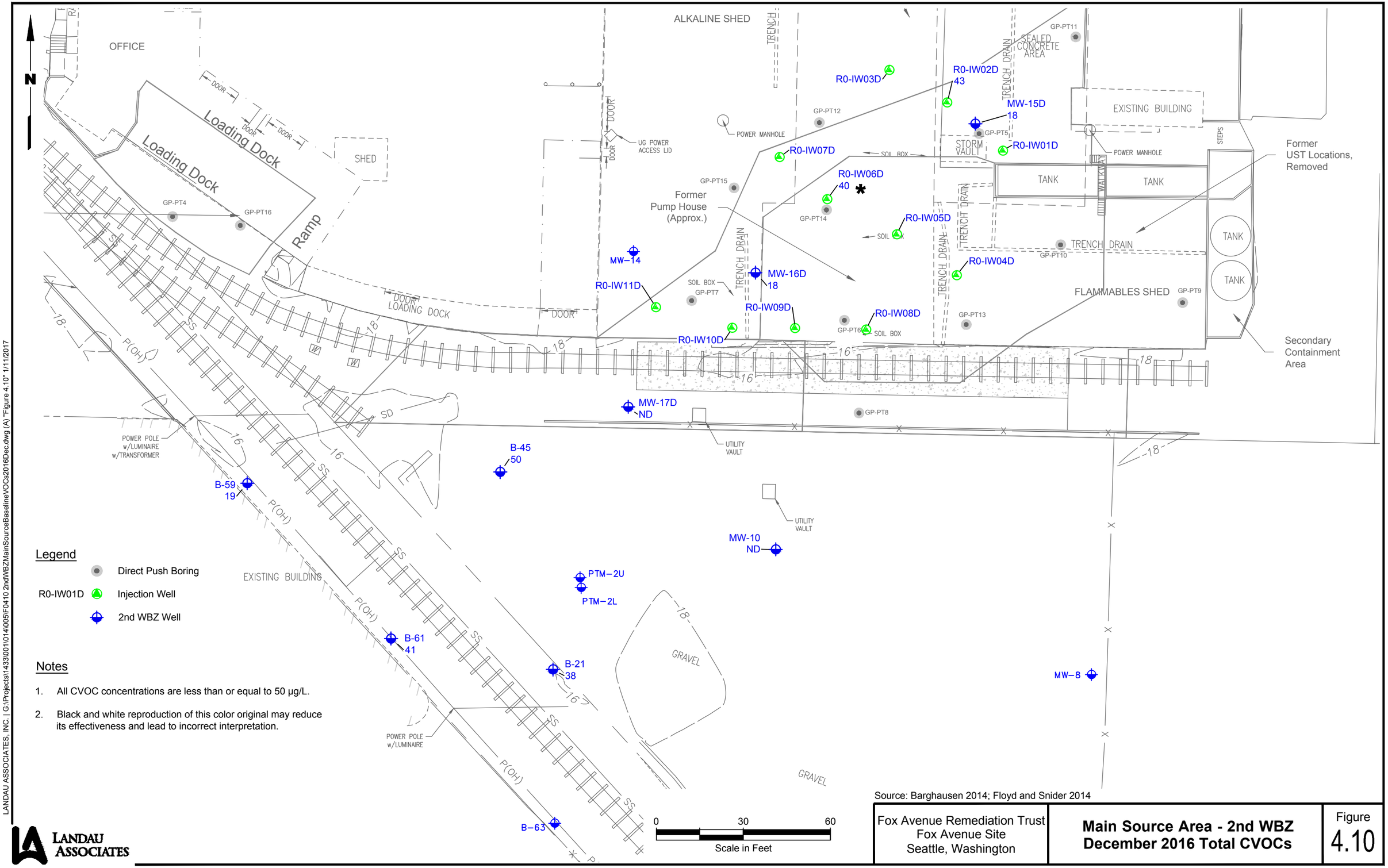
Fox Avenue Remediation Trust Fox Avenue Site Seattle, Washington	**Main Source Area - 2nd WBZ Baseline Total CVOCs**	Figure 4.9



Legend

- Direct Push Boring
- R0-IW01D — Injection Well
- 2nd WBZ Well

Notes

1. All CVOC concentrations are less than or equal to 50 µg/L.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Barghausen 2014; Floyd and Snider 2014

LANDAU ASSOCIATES, INC. | G:\Projects\1433\001\0141\005\F0410 2ndWBZMainSourceBaselineVOCs2016Dec.dwg (A) "Figure 4.10" 1/11/2017

LANDAU ASSOCIATES

Fox Avenue Remediation Trust Fox Avenue Site Seattle, Washington	**Main Source Area - 2nd WBZ December 2016 Total CVOCs**	Figure 4.10