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June 28, 2016

Mr. Nicholas Acklam
Washington State Department of Ecology
Southwest Regional Office
PO Box 47775
Olympia, Washington 98504

BY MAIL AND E-MAIL

RE: RESPONSE TO LETTER REGARDING ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY
LAKEVIEW FACILITY
2800 104TH STREET COURT SOUTH, LAKEWOOD, WASHINGTON
FARALLON PN: 188-002
VCP IDENTIFICATION NO: SW1012

Dear Mr. Acklam:

Farallon Consulting, L.L.C. (Farallon) has prepared this letter to provide a response to the e-mail message regarding Ecology Comments and Corrections on Farallon Meeting Summary from Mr. Eugene Radcliff with the Washington State Department of Ecology (Ecology) to Mr. Brani Jurista on March 10, 2016 (March 2016 Ecology Comments E-Mail) for the property at 2800 104th Street Court South in Lakewood, Washington (herein referred to as the Lakeview Facility) (Figure 1). The March 2016 Ecology Comments E-Mail included annotated comments and feedback on the Meeting Notes prepared by Farallon provided in an e-mail to Mr. Jason Cook with Ecology on December 21, 2015 summarizing the December 16, 2015 meeting between Ecology and Farallon regarding the sufficiency of characterization and cleanup actions at the Lakeview Facility. A copy of the March 2016 Ecology Comments E-Mail is provided in Attachment A of this letter.

Farallon appreciates Ecology input and comments regarding the cleanup of total petroleum hydrocarbons as diesel-range organics (DRO) and as oil-range organics (ORO), trichloroethene (TCE), arsenic, and lead at the Lakeview Facility. However, Farallon does not concur with a number of the Ecology comments and interpretations. Specific Ecology comments are summarized below in italics, followed by Farallon's response.

Figure 2 shows the general locations of Areas of Concern (AOCs) 1 through 5 on the Lakeview Facility. The cleanup action by excavation to address concentrations of DRO and/or ORO in soil and/or groundwater in AOC 1: Equipment Storage Carport Area; AOC 2: Equipment Parking Area; and AOC 3: Former Recycled Stockpile Area was completed in the southern and western portions of the Lakeview Facility in 2010. The cleanup action by air sparging and soil vapor extraction to reduce concentrations of TCE in groundwater in AOC 4: Asphalt-Testing Laboratory Area in the south-central portion of the Lakeview Facility occurred from 2010 through 2014. AOC 5: Fill Area is in the northeastern portion of the Lakeview Facility in the area of reported former stockpiling and landfilling of foundry waste material where concentrations of total and dissolved arsenic and lead have been detected in groundwater.

AREAS OF CONCERN 1, 2, AND 3 (DRO AND ORO)

Ecology Comment: *Monitoring Wells MW-11, MW-13, and MW-24 were not screened at the proper interval to confirm compliance with applicable MTCA Method A Groundwater Cleanup Levels (CULs). (ER)*

Farallon Response: Farallon disagrees with this Ecology comment and believes that monitoring well MW-11 in AOC 1, monitoring well MW-13 in AOC 2, and monitoring well MW-24 in AOC 3 are screened properly to monitor groundwater quality and confirm compliance with cleanup levels in those areas. Because the depth to groundwater seasonally fluctuates significantly (as much as 5 feet), the entire well screen interval is sporadically submerged at some of the monitoring wells. A discussion of the range of depths to groundwater and the well screen intervals follows. Corresponding groundwater elevation monitoring data are shown in Table 1; analytical results for groundwater samples collected from AOCs 1, 2, and 3 are summarized in Table 2. Boring and well construction logs for monitoring wells MW-11, MW-13, and MW-24 are provided in Attachment B.

Monitoring well MW-11 in AOC 1 is screened from approximately 8.5 to 15.5 feet below ground surface (bgs). The depth to groundwater has ranged from 6.2 to 11.27 feet below the top of the casing during groundwater monitoring events conducted by Farallon since 2008. The groundwater analytical data and field evidence demonstrated that DRO was present in the dissolved phase, and no light nonaqueous-phase liquid was present in AOCs 1, 2, or 3. DRO was detected in groundwater samples collected on February 6, 2009 and April 13, 2010, when the depth to groundwater was above the top of the screen in monitoring well MW-11. DRO was not detected at concentrations at or exceeding the laboratory reporting limit during subsequent groundwater monitoring events following excavation of petroleum-contaminated soil in 2010, when the depth to groundwater was within or just above the screened interval. Because the DRO is in the dissolved phase, analytical results for groundwater samples collected during monitoring events when the top of the groundwater is within the screen interval should be as valid as those collected during events when the top of shallow groundwater was above the screened interval. In fact, DRO was detected in groundwater samples when the top of shallow groundwater was above the screened interval.

Monitoring well MW-13 in AOC 2 is screened from approximately 14.4 to 24.4 feet bgs. The depth to groundwater has ranged from 13.2 to 18.05 feet below the top of the casing. DRO and ORO concentrations exceeding Washington State Model Toxics Control Act Cleanup Regulation (MTCA) cleanup levels in soil in AOC 2 were limited to a depth ranging from 0 to 4 feet bgs and did not extend to groundwater. This soil was excavated in 2010. DRO or ORO concentrations were not detected in groundwater samples collected from monitoring well MW-13 during groundwater monitoring events conducted prior or subsequent to the completion of excavation. The depth to groundwater was within the screened interval of monitoring well MW-13 during all of the groundwater monitoring events.

Groundwater was not encountered in borings during the remedial investigation field sampling conducted in AOC 3. Groundwater was encountered at 0.4 foot below the bottom of the excavation during the removal of contaminated soil in AOC 3. Monitoring well MW-24 was installed during the excavation activities to collect groundwater samples to evaluate the soil to groundwater pathway in AOC 3. The top of the screen interval in monitoring well MW-24 was installed at the shallowest possible depth of 2 to 4 feet bgs while maintaining the surface seal in accordance with the Minimum Standards for Construction and Maintenance of Wells, as established in Chapter 173-160 of the

Washington Administrative Code (WAC 173-160). The ground surface grade subsequently was raised, and the well casing was extended to match the new grade. The screen interval remained unchanged. The non-detect results for DRO and ORO in groundwater samples collected from monitoring well MW-24 during the excavation activities confirmed that the soil to groundwater pathway was incomplete.

During the February 16, 2011 meeting with Farallon, Messrs. Charles Cline and Scott Rose with Ecology discussed the construction of monitoring wells and analytical data for AOCs 1, 2, and 3, and agreed that no further monitoring of monitoring well MW-13 in AOC 2 was necessary and that groundwater sampling would continue at monitoring well MW-11 in AOC 1 for an additional three quarters and at monitoring well MW-24 in AOC 3 for an additional two quarters. The agreement was documented in the *Soil Excavation Cleanup Action Completion Report, Woodworth Lakeview Facility, 2800 104th Street Court South, Lakewood, Washington* dated March 28, 2011, prepared by Farallon (Soil Excavation Report). Farallon completed the groundwater sampling events agreed to, during which neither DRO nor ORO was detected at concentrations at or exceeding laboratory reporting limits. The results from the additional groundwater monitoring requested by Ecology were documented in the *Focused Feasibility and Disproportionate Cost Analysis Report, Lakeview Facility, 2800 104th Street Court South, Lakewood, Washington* dated April 14, 2015, prepared by Farallon (FFS/DCA Report).

Ecology Comment: *From Farallon's April 14, 2014 Focused Feasibility Study and Disproportionate Cost Analysis Report and March 28, 2011 Soil Excavation Cleanup Action Completion Report, the boring log for MW-13 does match the well screen data supplied in Table 5. (ER)*

Farallon Response: Farallon assumes that Ecology omitted the word "not" before the word "match" in the comment above. The boring log for monitoring well MW-13 is correct, and is included in Attachment B. Table 1 in this letter replaces Table 5 in the prior report, and now shows the corrected screen interval for monitoring well MW-13.

Ecology Comment: *Groundwater analysis for diesel-range (TPH-D) and oil-range (TPH-O) hydrocarbons using NWTPH-Dx with a silica gel/acid cleanup is not allowed (except in limited cases). All future NWTPH-Dx groundwater sample analyses are to be run without the silica gel/acid cleanup. (ER)*

Farallon Response: The sulfuric acid/silica gel cleanup procedure was the laboratory standard for treatment of samples to remove biogenic material from samples prior to analysis, and was used for the soil excavation cleanup action in 2010. The Ecology *Guidance for Remediation of Petroleum Contaminated Soils* (Publication No. 10-09-057) issued in September 2011 (Petroleum Guidance), after the 2010 cleanup, stated that use of the sulfuric acid/silica gel acid cleanup procedure was no longer recommended.

All soil and groundwater sampling events conducted in AOCs 1, 2, and 3 occurred before the Petroleum Guidance was issued, with the exception of one groundwater sampling event. Farallon agrees that if further analysis of groundwater samples for DRO or ORO is conducted, the analysis should be run without the sulfuric acid/silica gel cleanup procedure. There is no need to resample groundwater in AOCs 1, 2, or 3, as all Ecology requirements in effect at that time were met. Mr. Scott Rose concurred that no additional soil or groundwater sampling was necessary for AOCs 1, 2, or 3 during the March 10,

2015 meeting that included Ecology, representatives of the current owner (Miles Resources, Inc.), the former owner (Woodworth Capital, Inc.), and Farallon. A summary of the March 10, 2015 meeting was provided in an e-mail from Mr. Brani Jurista to Mr. Rose on March 13, 2015. Mr. Rose responded to Farallon's e-mailed summary on March 19, 2015, confirming that the meeting was adequately summarized by Farallon.

Ecology Comment: *Farallon sampled 127 soil samples from Area 1, Area 2, and Area 3. Of those samples, 40 sample results exceeded the applicable MTCA Method A CULs for diesel-range and/or oil-range hydrocarbons. Only one sample each from Areas (AOCs) 2 and 3 were sampled for carcinogenic polychlorinated aromatic hydrocarbons (cPAHs) and no samples were analyzed for polychlorinated biphenyls (PCBs). These cPAH samples were collected from soils samples that did not have diesel-range and oil-range hydrocarbons above the applicable CULs but were detected above the reporting limits. No soil sample was collected nor analyzed for cPAHs in AOC 1. Ecology does not consider two samples being analyzed for cPAHs as adequate, let alone representative, of the areas investigated. PAHs and PCBs are commonly found in asphalt, asphalt sealants, and reclaimed asphalt, please provide a rationale for not evaluating these constituents of concern (COCs). (ER)*

Farallon Response: The Ecology comment that soil samples analyzed for cPAHs did not have DRO or ORO concentrations above applicable cleanup levels is not correct. The cPAH analysis was performed on the soil samples having the highest concentrations of DRO and ORO in AOCs 2 and 3. DRO and ORO were detected at concentrations of 5,800 and 4,600 milligrams per kilogram, respectively, in soil sample A3-B2-P-100510-4.5 collected from AOC 3, which are significantly higher than the MTCA Method A or the site-specific MTCA Method B cleanup levels calculated for AOCs 2 and 3. cPAHs were not detected at concentrations exceeding the MTCA Method A cleanup level in this soil sample, which is considered a conservative and representative soil sample for AOCs 1, 2, and 3.

In the Opinion Letters dated June 17, 2010 and February 15, 2011, both signed by Mr. Charles Cline, Ecology agreed that DRO and ORO are the only COCs for AOCs 1, 2, and 3, and that cPAH analysis was adequate for calculation of site-specific MTCA Method B cleanup levels (Appendix B). Ecology approval of the site-specific MTCA Method B cleanup levels for AOCs 2 and 3 was provided in the February 15, 2011 Opinion Letter, along with approval of the plan to excavate soil having DRO and ORO concentrations exceeding these levels. The MTCA Method A cleanup level was the applicable cleanup level for soil in AOC 1.

According to Ecology's comment in the March 2016 Ecology Comments E-Mail, PCBs were referenced as potential COCs for the Lakeview Facility because they are "commonly found in asphalt, asphalt sealants, and reclaimed asphalt". As documented in the *Remedial Investigation/Feasibility Study Report, Woodworth & Company, Inc., Lakeview Facility, 2800 104th Street South, Lakewood, Washington* dated August 19, 2009, prepared by Farallon (RI/FS Report), the source(s) of DRO and ORO in AOCs 1, 2, and 3 likely are fugitive spills, leaks, and drips from aboveground and underground storage tanks, piping, and fuel dispensers associated with the storage and distribution of petroleum products and equipment and vehicle maintenance and storage, not from asphalt. PCBs may occur in transformer dielectric fluids and potentially in asphalt, neither of which was identified as sources of contamination in the RI/FS, and neither of which is a COC for AOCs 1, 2, or 3.

In the Opinion Letters dated June 17, 2010 and February 15, 2011, Ecology agreed that DRO and ORO are the only COCs for AOCs 1, 2, and 3 (Appendix B). In the December 16, 2015 meeting with Farallon, Ecology agreed that no additional work in AOCs 1, 2, or 3 was necessary. There is sufficient information, including analytical data and the sources of contamination to soil, to support the conclusion that cPAHs and PCBs are not COCs for AOCs 1, 2 or 3.

Ecology Comment: *Provide images or elevation drawings of the completed excavations. (ER)*

Farallon Response: Figures showing the lateral extent of the excavations and the performance and confirmation soil sample locations in AOCs 1, 2, and 3 were provided to Ecology in the Soil Excavation Report, which also documented the final depths of each excavation. To comply with the Ecology request, Farallon has revised the figures to more clearly show the depth of the excavation in each of the 30- by 30-foot grid areas within AOCs 1, 2, and 3 (Figures 3, 4, and 5).

Ecology Comment: *Groundwater COCs are TPH-D and TPH-O (without silica gel cleanup), cPAHs, and PCBs. (ER)*

Farallon Response: Ecology Opinion Letters from June 2010 and February 2011 confirmed that the COCs for AOCs 1, 2, and 3 are DRO and ORO (Appendix A). For reasons cited in Farallon's response above, cPAHs and PCBs are not considered COCs for AOCs 1, 2, or 3.

Ecology Comment: *New wells will have to be installed in AOCs 1, 2, and 3. (ER)*

Farallon Response: Farallon does not concur that installation of new monitoring wells in AOCs 1, 2, or 3 is necessary. There is no technical justification for installation of additional wells in these AOCs.

Delineation and cleanup of petroleum-contaminated soil in AOCs 1, 2, and 3 have been completed, with results documented in the Soil Excavation Report. Confirmation groundwater samples were collected in accordance with the agreement with Ecology reached at the February 16, 2011 meeting with Farallon, attended by Mr. Charles Cline. The confirmation groundwater sample results for AOCs 1, 2, and 3 were provided in the FFS/DCA Report.

Ecology, represented by Messrs. Jason Cook, Nnamdi Madakor, Steve Teel, and Eugene Radcliff (via telephone), and Mss. Sue La Voie and Richelle Perez, agreed in the December 16, 2015 meeting with Farallon that characterization and cleanup of AOCs 1, 2, and 3 have been sufficiently completed, contrary to the March 2016 Ecology Comments E-mail.

Ecology Comment: *Ecology does not agree that Farallon should request a review of the cleanup for AOC 1, 2, and 3 at this time. Diesel-range and oil-range hydrocarbons plus cPAHs in groundwater in these areas have not been adequately characterized. Please address all comments above and provide Ecology with a work plan for review and comment. (ER)*

Farallon Response: Preparation of a work plan for installation of additional monitoring wells for Ecology review and comment is not necessary for the reasons cited in Farallon's responses above.

AREA OF CONCERN 4 (TCE)

FURTHER TCE SOURCE IDENTIFICATION

Ecology Comment: *The TCE MTCA Method B Groundwater CUL is 4 micrograms per liter (see online CLARC Guidance).*

Farallon Response: Farallon does not know why the MTCA Method B groundwater cleanup level for TCE in AOC 4 is referenced in the March 2016 Ecology Comments E-Mail. The MTCA Method A groundwater cleanup level of 5 micrograms per liter was accepted by Ecology, documented in the Ecology Opinion Letters from June 2010 and February 2011, and is the applicable cleanup level for TCE in AOC 4.

Ecology Comments: *Ecology has determined the TCE source area(s) has not been adequately delineated in the vertical or horizontal extents. The need for additional soil sample analysis collection in and around the TCE source area as depicted in Figure 7 of the Focused Feasibility Study and Disproportionate Cost Analysis Report dated April 14, 2014 (see Ecology's comment #1 for detail in the 2015 Further Action Opinion Letter).*

Perform enhanced soil gas survey of the TCE source area (see also Ecology's comment #3 from the 2015 Opinion Letter).

Farallon Response: Farallon has concluded that there is sufficient information for the evaluation and selection of the final cleanup action for TCE in AOC 4, as documented in the RI/FS Report and FFS/DCA Report. Farallon will collect soil gas samples and additional soil samples to further characterize the TCE source area at and in the vicinity of the presumed location of the former Washington State Department of Transportation (WSDOT) mobile laboratory. The analytical results from the soil gas sampling will be used to define the location(s) of TCE source areas, if possible. Vapor intrusion assessment results are discussed in Farallon's response below.

Ecology Comment: *Quarterly groundwater sampling (see Ecology's comment #2 from the 2015 Opinion Letter). In addition, no demonstration has been provided to confirm that natural attenuation is indeed occurring at the Site. Missing from the discussion are a plume stability analysis, geochemical indicators, and long-term groundwater data to substantiate that assumption. (ER)*

Farallon Response: *The Remedial Investigation Work Plan, Woodworth & Company, Inc., Lakeview Facility, 2800 104th Street South, Lakewood, Washington 98499* dated January 26, 2009 prepared by Farallon and the RI/FS Report contains information that documents a declining trend of TCE concentration in groundwater in AOC 4 even before installation and operatation of the air sparge and soil vapor extraction remediation system commenced in 2010. Plume stability, geochemical indicators, and long-term groundwater data from 1994 through 2009 was presented and discussed in the RIFS Report. The RIFS Report concluded that a trend of decreasing concentrations of TCE in groundwater at the Lakeview Facility likely is attributable to adsorption, dilution, and dispersion rather than the process of biodegradation by reductive dechlorination, due to the minimal presence to lack of TCE degradation products.

Farallon has collected additional groundwater samples to demonstrate that there is no rebound of TCE concentrations and that natural attenuation of TCE is continuing even after the air sparge and soil vapor

extraction components of the remediation system were shut down in March 2013 and September 2014, respectively. Table 3 summarizes TCE concentrations in AOC 4. Figures 6 and 7 show TCE concentrations and plume outlines in shallow and deep water-bearing zones in AOC 4, respectively. The decrease in concentrations of TCE in groundwater over time is graphically depicted on Chart 1. The laboratory analytical results from the January 2016 monitoring event compared to those from prior monitoring events show stable to decreasing TCE concentrations in groundwater in five key shallow and deep water-bearing zone monitoring wells where concentrations of TCE were detected prior to start-up of the remediation system. Chart 1 includes exponential regression trend lines for TCE concentrations in each of these five monitoring wells to estimate the time when TCE concentrations would decrease to less than the MTCA Method A cleanup level of 5 micrograms per liter (µg/l). Chart 1 shows that TCE concentrations may reduce to less than the cleanup level in approximately 16 years. Ongoing groundwater monitoring in AOC 4 will be used to confirm that this TCE-reducing trend is continuing.

Ecology Comment: *Based on the conceptual discussion at the meeting, Ecology recommended additional discussion in the feasibility study based on the results of further source identification such as adding alternatives remedies or including more discussion of the geology that justifies the use of specific alternatives.*

Farallon Response: Farallon will provide an addendum to the FFS/DCA Report following completion of the additional characterization and groundwater monitoring in AOC 4.

Ecology Comment: *Sufficiently characterize the interrelationship between the shallow, deep, and regional aquifers (see Ecology comment #7 from the 2015 Opinion Letter).*

Farallon Response: Farallon will collect additional groundwater samples and elevation monitoring data to evaluate the interrelationship between the aquifers. A work plan for conducting aquifer testing will be prepared for Ecology review and comment.

INDUSTRIAL WATER WELL

Ecology Comments: *Perform aquifer test for the regional aquifer and the deep water-bearing zone (pump from industrial water well and monitor response in deep water-bearing zone wells). Aquifer testing was merely mentioned by Farallon as a possible option during the meeting to support Farallon's assertion that decommissioning of the industrial well was not needed. Farallon also suggested that a "clean" lens of groundwater (for example well MW-14C as shown on cross-section A-A' in Figure 7) separates the deep TCE plume from the industrial water well. Before Ecology can agree and/or recommend aquifer testing, the specifics of the proposed test plan would need to be presented for review. Additional quarterly sampling of MW-14C should also be performed. Ecology also recommends that water samples from MW-14C also be collected as part of the proposed aquifer test. MW-14C has only been sampled once in September 2009 so there is uncertainty about contaminant concentrations at the base of the aquifer immediately above the industrial well. However, nearby well MW-14 (within the plume) has been sampled 10 times since September 2009. Please also present to Ecology the proposed list of wells to be included in the quarterly sampling events.*

If there is response, perform a Wellhead Protection Area modeling in order to determine an appropriate location for a replacement industrial well and then decommission the existing industrial well and install a replacement well.

Ecology agrees that additional data can be collected before deciding on whether or not the industrial water well be decommissioned (Ecology comment #4 from the 2015 Opinion Letter).

Farallon Response: TCE concentrations in the industrial water well were consistently an order of magnitude less than the MTCA Method A cleanup level when sampled in 2008, 2009, and 2015. These results demonstrate that operation of the industrial water well is not a threat to human health or the environment. Although collection of additional data is not necessary, Farallon will collect water samples from the industrial well and monitoring wells to evaluate whether aquifer testing is necessary to support the conclusions already presented in the RI/FS Report.

Ecology Comments: *Please reconcile the two statements from the Focused Feasibility Study and Disproportionate Cost Analysis Report dated April 14, 2014. First, in Section 4.2, "Shallow and deep groundwater at the Site were impacted by the releases of TCE attributed to past operations and practices of using TCE in the asphalt-testing process by a former WSDOT mobile testing laboratory." And the second statement in Section 4.4.2, "Off-Site sources of TCE that may be affecting groundwater in shallow and deep water-bearing zones on the Site are defined by the detection of TCE at concentrations less than the MTCA Method A cleanup level in up-gradient monitoring wells MW-1, MW-15, and MW 29 (Figure 6)." If there is evidence to support the second statement, then please provide it to Ecology for review. Ecology suggests installing a deep and shallow well up gradient of the Site between the assumed off-Site source and the Woodworth Site to aid in that determination.*

Farallon Responses: The former WSDOT mobile laboratory used TCE in its asphalt-testing processes. The source(s) of TCE to shallow and deep groundwater are attributable to fugitive spills, leaks, and drips associated with the use of TCE in laboratory testing processes conducted by WSDOT. The WSDOT mobile laboratory was a trailer that was not stationary at a single location. The locations of the former WSDOT mobile laboratory are not well documented, and releases likely occurred at more than one location. The most-likely or most-commonly cited location of the former WSDOT mobile laboratory is shown on figures prepared by Farallon that were previously provided to Ecology.

TCE was detected at low concentrations, less than the MTCA Method A cleanup level, in groundwater samples collected from monitoring wells up-gradient of the presumed location of the TCE source area(s) associated with the WSDOT mobile laboratory. For example, TCE was detected at concentrations less than the MTCA Method A cleanup level in up-gradient shallow and deep water-bearing zone monitoring wells MW-1, MW-15, MW-25, and MW-29 (Figures 6 and 7). These monitoring wells are located between the TCE plume exceeding the MTCA Method A cleanup level in groundwater and the southern property boundary for the Lakeview Facility. Sufficient groundwater data exist to separate the TCE plume in groundwater in AOC 4 having concentrations exceeding the MTCA Method A cleanup level from potential off-site source areas. The concentrations of TCE in groundwater up-gradient of the former WSDOT mobile laboratory area(s) are less than the MTCA Method A cleanup level and do not warrant further assessment.

VAPOR INTRUSION

For unknown reasons, Ecology crossed out Farallon's explanation that the vapor intrusion pathway is an incomplete exposure pathway for TCE in AOC 4 in the March 2016 Ecology Comments E-Mail. The following comments were provided by Ecology.

Ecology Comment: *The results of the proposed soil and soil gas sampling from the TCE source area are important in evaluating the potential for vapor intrusion at the Site for both current and future land use scenarios.*

Farallon Response: Ecology did not agree with the results from the vapor intrusion assessment conducted by Farallon presented in the FFS/DCA Report because the assessment assumed placement of 30 feet of clean fill at the Lakeview Facility (Ecology comment #3 in the October 6, 2015 Opinion Letter). However, placement of clean fill is one of the regulatory requirements for site reclamation due to the gravel and sand mining operations previously conducted at the Lakeview Facility. Construction and redevelopment cannot proceed until the reclamation has been completed. Ecology further concluded in the October 6, 2015 Opinion Letter, "the Tier I Vapor Intrusion assessment must reflect existing conditions at the Site."

The Lakeview Facility is zoned Industrial and currently is used for industrial purposes. No plans exist at this time for any other uses. No residences or buildings for human occupancy are present within 100 feet of the TCE groundwater plume in the shallow water-bearing zone. The current maximum TCE concentration in shallow water-bearing zone groundwater is 5.2 µg/l. The MTCA Method C vapor intrusion industrial screening levels for TCE in groundwater are 8.4 µg/l (non-cancer) and 26.5 µg/l (cancer). Based on these data, the existing site conditions, and the use of the Lakeview Facility for industrial purposes, TCE concentrations in shallow groundwater are protective of the vapor intrusion pathway, and no additional vapor intrusion characterization is necessary.

Ecology Comment: *Prepare a new VCP application for AOC 4 (the TCE area)*

Farallon Response: Farallon will prepare a new Voluntary Cleanup Program (VCP) application for AOC 4.

Ecology Comment: *Following the collection of all supplemental RI data requested by Ecology, prepare an addendum to the Focused Feasibility Study/Disproportionate Cost Analysis Report (FFS/DCA Report) to modify/update the vapor intrusion assessment based on the above and include additional cleanup alternatives for TCE in soil (if detected) and shallow groundwater.*

Farallon Response: Farallon will prepare an addendum to the FFS/DCA Report to revise the vapor intrusion assessment evaluation pathway to reflect the industrial exposure scenario referenced above.

AOC 5 (ARSENIC AND LEAD)

Ecology Comment: *Define the full extent of the total arsenic and lead groundwater plume (see Ecology comment #5 from the 2015 Opinion Letter). Install 2 monitoring wells along the northern property boundary in the shallow water-bearing zone northeast and northwest of monitoring well MW-31. Install additional wells as necessary to delineate the plume.*

Farallon Response: Farallon installed two additional monitoring wells in the shallow water-bearing zone on the northern Lakeview Facility property boundary in accordance with the request from Ecology in the March 2016 Ecology Comments E-Mail and the October 6, 2015 Opinion Letter (Appendix A). Monitoring wells MW-33 and MW-34 were installed northeast and northwest of monitoring well MW-31, respectively (Figure 8). The boring logs for monitoring wells MW-33 and MW-34 are provided in Appendix B.

Based on the groundwater elevations summarized in Table 1, the groundwater flow direction for the shallow water-bearing zone in AOC 5 was estimated to be southwest (Figure 8), which is consistent with the results from prior groundwater monitoring events.

Monitoring wells MW-12 and MW-31 are the only monitoring wells where concentrations of total and dissolved arsenic and total lead were detected at concentrations exceeding MTCA Method A cleanup levels in groundwater (Table 4). The nature and extent of arsenic and lead in groundwater has been fully delineated with the existing monitoring well network.

Total or dissolved arsenic or lead was not detected at concentrations at or exceeding laboratory reporting limits in groundwater samples collected from new monitoring wells MW-33 or MW-34. Total arsenic and lead were detected at concentrations less than MTCA Method A cleanup levels in groundwater samples collected from monitoring well MW-32; dissolved arsenic or lead was not detected at concentrations at or exceeding the laboratory reporting limits in groundwater samples collected from this well. Total or dissolved arsenic or lead was not detected at concentrations at or exceeding laboratory reporting limits in a groundwater sample collected from monitoring well MW-9. Down-gradient monitoring well MW-30 was dry; no groundwater samples were collected from this well.

The vertical extent of the arsenic and lead plume in groundwater has been defined by the analytical results from monitoring well MW-12B screened in the deep water-bearing zone. Total arsenic and lead were detected at concentrations less than MTCA Method A cleanup levels in groundwater samples collected from monitoring well MW-12B; dissolved arsenic or lead was not detected at concentrations at or exceeding laboratory reporting limits in groundwater samples collected from this well.

Ecology Comment: *Please provide geochemical data to support assertion that "fill material may have created geochemical reducing conditions."*

Farallon Response: As presented in detail in the FFS/DCA Report, arsenic or lead was not detected at concentrations exceeding MTCA Method A cleanup levels in soil samples collected from borings and test pits in AOC 5 (Table 5). An elevated pH exceeding 8.5, and negative oxidation-reduction potential (ORP) were routinely measured in groundwater samples collected from shallow water-bearing zone monitoring wells MW-12 and MW-31. An elevated pH or a negative ORP were not detected in other shallow water-bearing zone monitoring wells within AOC 5. Geochemical indicators pH and ORP and groundwater quality parameters dissolved oxygen, temperature, and specific conductance measured in groundwater samples collected in AOC 5 during the remedial investigation field program in 2009 and the most-recent groundwater sampling event in January 2016 are shown in Table 6.

Ecology Comment: *Please provide a new AOC 5 map depicting monitoring well, boring, ASV well, and test pit locations on a base map indication the elevation of the sampling locations. This is needed to help determine what, if any impacts, depth of fill and its distribution may have had on releasing metals to groundwater contributing to elevated metal concentrations in groundwater. Lidar images are available for the Site.*

Farallon Response: Farallon is preparing a figure depicting elevations of the sampling locations and ground surface contours for AOC 5. The figure will be provided to Ecology in a separate submittal.

Ecology Comment: *Collect a grab groundwater sample from the off-property area to the east.*

Farallon Response: Collecting additional groundwater samples for arsenic or lead analysis off the Lakeview Facility to the east is not necessary. The nature and extent of arsenic and lead in groundwater has been completely delineated with the existing monitoring well network and does not extend off the Lakeview Facility to the east. In the December 16, 2015 meeting with Farallon, Ecology agreed that characterization of arsenic and lead in groundwater will be completed when it is demonstrated that the results from new monitoring wells MW-33 and MW-34 do not exceed MTCA Method A cleanup levels for arsenic or lead in groundwater and if the groundwater flow direction for the shallow water-bearing zone is not to the north or east. The locations of monitoring wells MW-33 and MW-34 were confirmed by Ecology in the January 21, 2016 e-mail message from Mr. Eugene Radcliff to Mr. Brani Jurista prior to installation of these wells; no additional monitoring wells or groundwater sampling locations were requested or deemed necessary.

Ecology Comment: *Sample groundwater for total and dissolved arsenic and lead at the two new wells and in the existing groundwater wells during quarterly sampling.*

Farallon Response: Farallon has complied with the Ecology request to sample groundwater for total and dissolved arsenic and lead. However, the groundwater samples collected from AOC 5 for analysis for total arsenic and lead were turbid, and not considered representative of metal concentrations in groundwater, as suspended solids in groundwater often yield erroneous results for total metals. A significant difference between the concentrations detected in total metals and in dissolved metals was consistently reported. Therefore, Farallon considers the filtered groundwater samples submitted for analysis for dissolved arsenic and lead to be representative of groundwater conditions in AOC 5. The frequency and adequacy of total or dissolved metals analysis for additional groundwater samples collected from AOC 5 in the future will be discussed with Ecology and defined in the Groundwater Monitoring Plan as part of the Environmental Covenant.

FOCUSED FEASIBILITY STUDY AND DISPROPORTIONATE COST ANALYSIS

Ecology Comments: *The FFS/DCA should be put on hold.*

Once Ecology has determined the contamination is characterized and fully defined prepare an addendum to the FFS/DCA for Ecology review. Ecology will make the final determination on all proposed applicable CULs, proposed COCs, proposed remedial alternative and disproportionate cost analysis, all proposed points of compliance, proposed reasonable restoration time frames, types of institutional or engineered controls.

Modify/update the vapor intrusion assessment based on the above comments and additional investigations and include any revisions to the cleanup alternatives for TCE in soil (as needed) and shallow groundwater.

Farallon Response: Farallon does not agree that a re-evaluation of cleanup levels, COCs, remedial alternatives, and the DCA analysis that was reviewed and approved by two different Ecology Project Managers is necessary. Site conditions have not changed, active remediation has been conducted for a number of years, and the nature and extent of contamination has been investigated. Farallon will conduct additional investigation in AOC 4, as discussed in the March 2016 meeting, and will prepare an addendum to the FFS/DCA Report. However, re-evaluating cleanup levels and COCs at this stage is unwarranted and unnecessary.

OTHER ITEMS OF NOTE

Ecology Comment: *Please explain the reference in Focused Feasibility Study and Disproportionate Cost Analysis Report dated April 14, 2014 on page 1-1, second paragraph, last sentence "The selected cleanup action approved by the Washington State Department of Ecology (2010; 2011) was implemented between 2010 and 2013 by the former owner of the Site, Woodworth and Company, Inc., as an independent remedial action under the Ecology Voluntary Cleanup Program (VCP Identification No. NW 2600)".*

Farallon Response: The cleanup action alternatives selected and described in the RI/FS Report and detailed in the *Engineering Design Report, Woodworth Capital, Inc., Formerly Known as Woodworth & Company, Inc., Lakeview Facility, 2800 104th Street South, Lakewood, Washington 98499* dated January 20, 2010, prepared by Farallon were provided to Ecology for review and opinion. The Ecology Opinion Letters dated June 17, 2010 and February 15, 2011 confirmed that characterization of the Lakewood Facility was sufficient to establish cleanup standards and select a cleanup action (Attachment A).

Both Ecology Opinion Letters stated that Ecology has determined that the proposed cleanup action meets the substantive requirements of MTCA. Based on these opinions, the proposed cleanup action was implemented between 2010 and 2013 under the Ecology VCP.

Ecology Comment: *Table 3 in FFS/DCA is listed as "Soil Analytical Results for AOC 5" when data was clearly referring to AOC 4.*

Farallon Response: That was a typographical error. The Table 3 title will be corrected in the Addendum to the FFS/DCA Report.

Ecology Comment: *Laboratory reports being inserted into FFS/DCA upside down.*

Farallon Response: Farallon cannot verify whether laboratory reports were inserted upside down in the hard copy of the FFS/DCA Report. Laboratory reports in the electronic copy of the FFS/DCA Report were inserted correctly.

Ecology Comment: *Maps were vague, in some cases, lacking sufficient detail or narrative to fully or clearly depict what information was intended to be displayed. If the data presented is not clear then*

too much time is wasted by the reviewer trying to decipher the data and re-interpret the presentation, which should be able to stand alone. For instance: The 2015 FFS/DCA geologic representation of cross-section D-D' cannot be supported by the data points used. The spatial distribution of the data points is much greater than geologic structures expected from this geologic depositional regime; too much detail could be missed.

Farallon Response: Farallon provides accurate and comprehensible information; it is Farallon's opinion that the figures provided in the FFS/DCA clearly depict Lakeview Facility environmental conditions. It is unfortunate that the Ecology reviewer had difficulty interpreting some data, including cross-section D-D' in the FFS/DCA Report.

The information presented on cross-section D-D' was based on Farallon's interpretation of the depositional regime and backfilling, and interpolation between monitoring well borings. On any cross-section constructed by interpolating information between borings rather than from a continuous trench, there is always interpretation and extrapolation of lithologic contacts and hydrogeology. Depicted on cross-section D-D' are generalized units showing the vertical extent of fill material, less-permeable sand and gravel units, and more-permeable silt and silty gravel units. Information derived from monitoring well borings that was transposed from the distance onto the cross-sectional trace is noted.

Cross-section D-D' presents sufficient information to conceptualize the generalized stratigraphy, groundwater elevation and flow direction, and location, distribution and potential transport of contaminants within the two distinct water-bearing zones.

Ecology Comment: *Figure 3 from the 2011 Soil Excavation Cleanup Action Report, the figure was unclear when depicting the excavation bottom. The narrative was also not clear as to the bottom depth across the excavation at specific locations. The reader is left with left to wonder if all the contaminated soil was excavated. Did the bottom vary in depth to coincide with the soil contamination? Some of the soil confirmation data points were questionable because of the widespread distance from (clean and dirty) sample locations, as providing supportable evidence that the contamination had been removed. Photos of the excavations would provide clarity to the how the excavation was completed.*

Farallon Response: The bottom depth of each of the three excavations was described in the text of the Soil Excavation Report. In addition, the figures depicted the identification and depth of collection for each soil sample. Revised Figures 3, 4, and 5 in this letter more clearly identify the depth of excavation in each 30- by 30-foot grid area for AOCs 1, 2, and 3.

Confirmation soil samples were collected from each 30- by 30-foot grid area confirming that the cleanup was completed. The maximum 30-foot distance between the sidewall and base of excavation soil samples is consistent with industry standards and is sufficient to confirm the cleanup is complete. Photographs can be provided if necessary.

Ecology Comment: *All groundwater elevation data must be referenced using the NAVD88. The Table 2 footnote from the 2015 FFS/DCA indicates that the datum used was the NGVD29.*

Farallon Response: The NGVD 29 datum was the datum available at the onset of the project for existing monitoring wells and structures at the Lakeview Facility. For consistency, Farallon retained that benchmark and datum throughout the project. Farallon will update and convert the site data to

NAVD88 datum for the planned future submittal of data to the Ecology Environmental Information Management (EIM) System.

Ecology Comment: *All analytical data collected after August 1, 2005 must be uploaded into Ecology's Environmental Information Management (EIM) System.*

Farallon Response: Farallon is aware of this Ecology requirement, and intends to upload the Lakeview Facility environmental data to the Ecology EIM System in the near future.

Ecology Comment: *Ecology does not agree with your 2015 FFS/DCA assessment of the shallow groundwater as non-potable. Please review the criteria set forth in WAC 173-340-720(2)(b)(i) when attempting to make a determination of whether Ecology views a groundwater as potable. Please apply all relevant criteria stated in WAC 173-360 when attempting to make this determination. Ecology has made no such determination.*

Farallon Response: All relevant criteria for non-potable groundwater promulgated in WAC 173-340-720(2) are met, as documented in the RI/FS Report and the FFS/DCA Report:

- Shallow water-bearing zone groundwater is not used as a current source of drinking water.
- Shallow water-bearing zone groundwater is a non-potable resource due to insufficient yield, which is less than the quantity required by WAC 173-40-720 of more than 0.5 gallon per minute on a sustainable basis.
- No water supply wells at or in the vicinity of the Lakeview Facility use groundwater as a potable water source.
- Use of groundwater as a potable water source is not allowed within the City of Lakewood.
- The industrial water-supply well on the Lakeview Facility is used for industrial process water only, and is not considered a potable water source by the operators.
- Deep water-bearing zone groundwater underlying the shallow water-bearing zone may qualify as a potential future source of potable water. However, because of the availability of a municipal water supply in the vicinity of the Lakeview Facility and the restriction on use of groundwater as a potable water supply, groundwater in the deep water-bearing zone at the Lakeview Facility or adjacent properties cannot be used as a potable water source.
- Concentrations of TCE, arsenic, and lead in groundwater are confined to groundwater in limited areas within the Lakeview Facility boundary, and do not and are not expected to extend off the Lakeview Facility in the future.

Farallon does not know why Ecology referenced Underground Storage Tank Regulations under WAC 173-360 for determining whether groundwater is potable. The appropriate reference is WAC 173-340-720(2).

Ecology Comment: *When stamping a Report with a professional seal, please make sure the professional is currently licensed and up to date with the requirements of the Department of Licensing.*

Farallon Response: Farallon does not know why this comment was made. Farallon is aware of this requirement. The professionals who sign and stamp Farallon's reports are licensed and up to date with Washington State Department of Licensing requirements.

CLOSING

Mr. Eugene Radcliff was the fourth Ecology Project Manager assigned to the Lakewood Facility and is no longer the Project Manager. Farallon understands that no Ecology Project Manager has been assigned to the Lakeview Facility. Therefore, it is unclear how the technical issues addressed in this response letter will be resolved. Farallon requests that Ecology provide a recommendation on how to resolve these issues in a timely manner.

Farallon appreciates the opportunity to provide the requested information, and trusts that this provides sufficient information to address the comments provided in the March 2016 Ecology Comments E-Mail. If you have questions, please contact either of the undersigned at (425) 295-0800.

Sincerely,

Farallon Consulting, L.L.C.

Brani Jurista, L.G.
Senior Geologist

Peter Jewett, L.G., L.E.G.
Principal Engineering Geologist

Attachments: Figure 1, *Site Vicinity Map*
Figure 2, *Site Plan*
Figure 3, *AOC 1 Soil Sample Locations*
Figure 4, *AOC 2 Soil Sample Locations*
Figure 5, *AOC 3 Soil Sample Locations*
Figure 6, *TCE Concentrations in Shallow Water-Bearing Zone*
Figure 7, *TCE Concentrations in Deep Water-Bearing Zone*
Figure 8, *Arsenic and Lead Concentrations in Groundwater*
Table 1, *Monitoring Well Elevation Data for Shallow Water-Bearing Zone*
Table 2, *Groundwater Analytical Results for AOC 1, 2, and 3*
Table 3, *Groundwater Analytical Results for AOC 4*
Table 4, *Groundwater Analytical Results for AOC 5*
Table 5, *Soil Analytical Results for AOC 5*
Table 6, *Natural Attenuation Parameters and Geochemical Indicators*
Chart 1, *TCE in Groundwater Concentration Trends*

Attachment A, Ecology Letters
Attachment B, Boring Logs

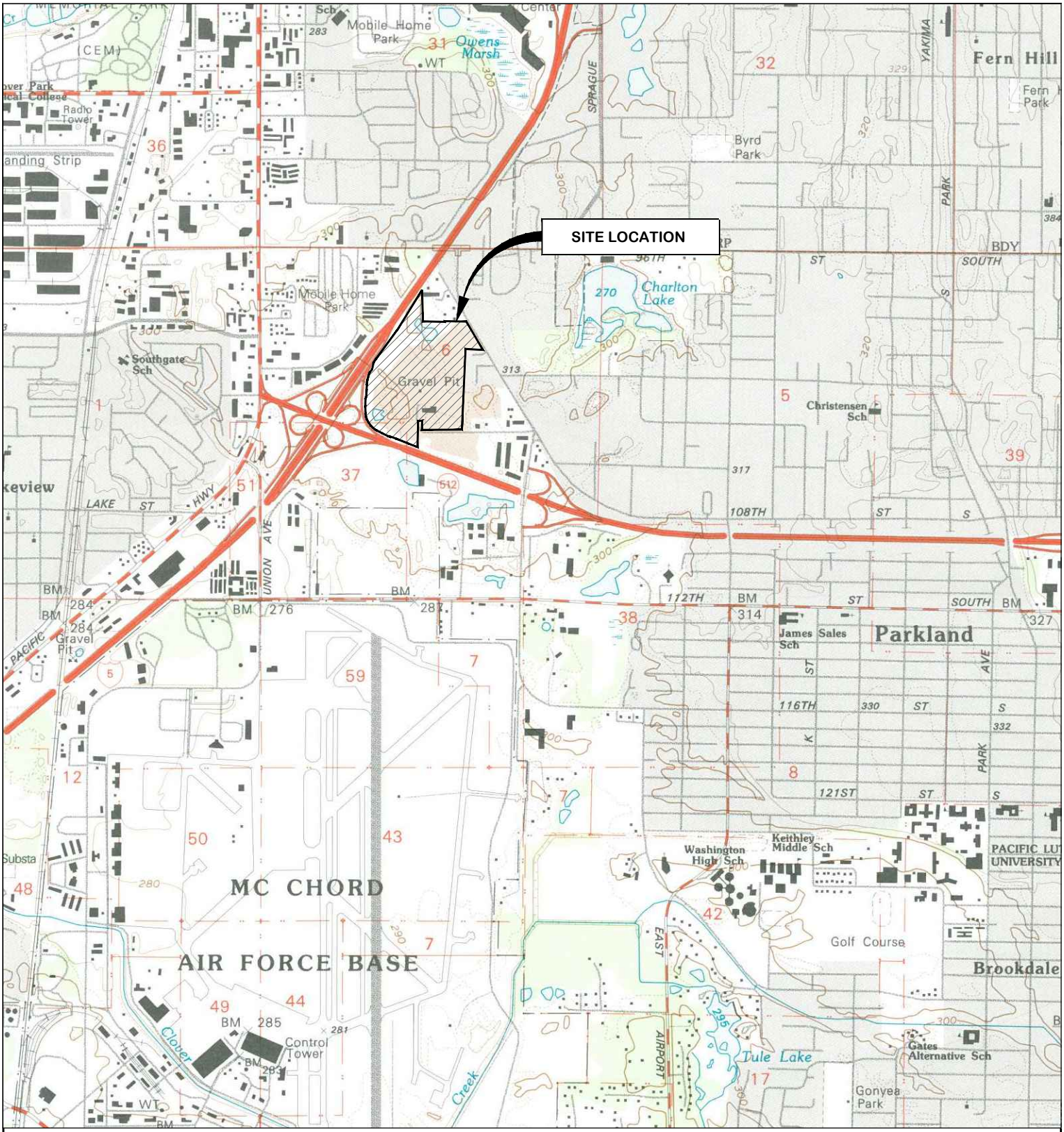
cc: Jeff Woodworth, Woodworth Capital, Inc. (by e-mail)

BJ/PJ:bjj

FIGURES

RESPONSE TO LETTER REGARDING ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY
Lakeview Facility
Lakewood, Washington

Farallon PN: 188-002



REFERENCE: 7.5 MINUTE USGS QUADRANGLE TACOMA SOUTH, WASHINGTON. DATED 1991

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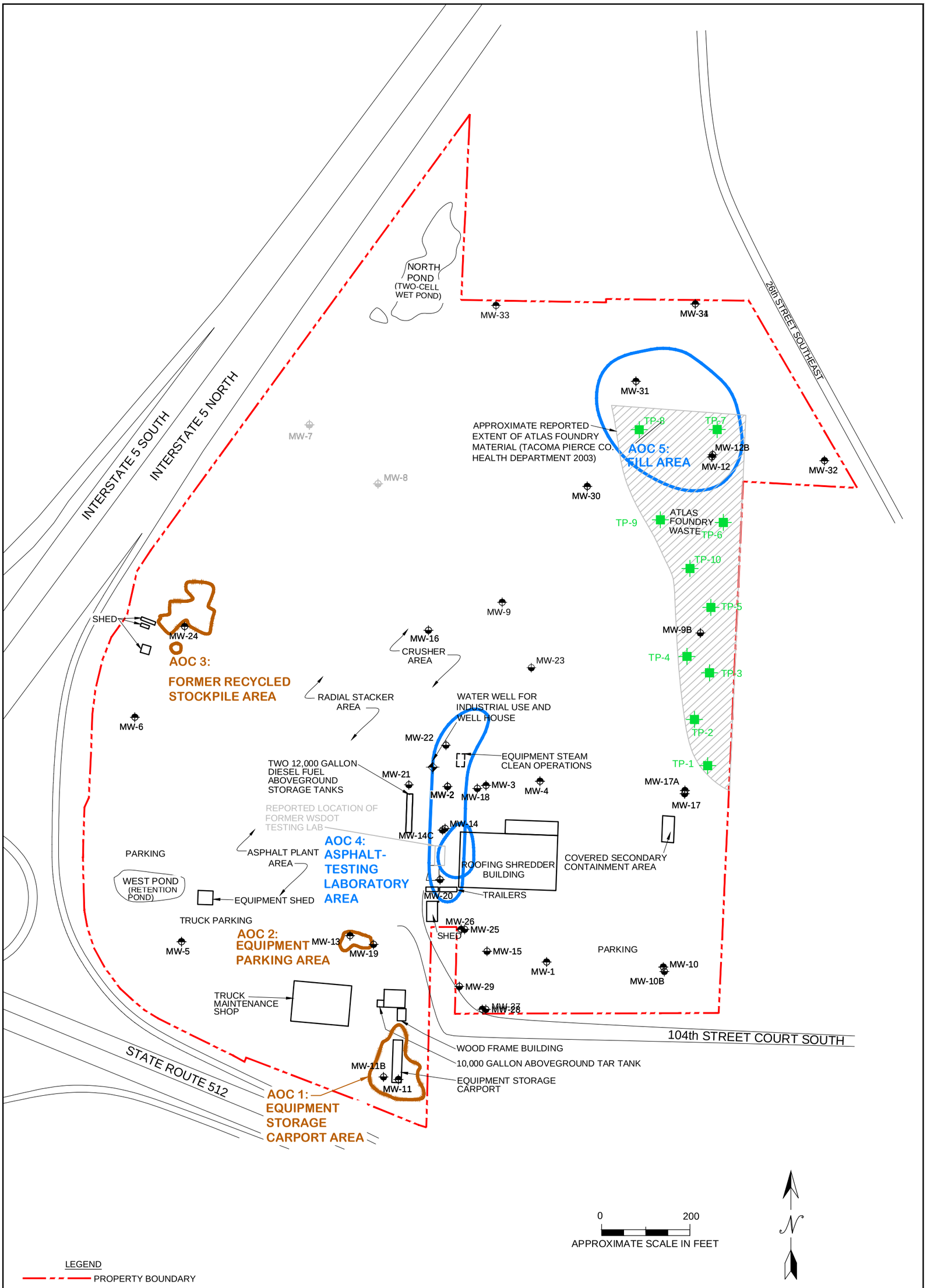
FIGURE 1

SITE VICINITY MAP
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 3/27/2015 Disk Reference: 188002b



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE AREA OF COMPLETED SOIL CLEANUP ACTION
- APPROXIMATE AREA OF GROUNDWATER CLEANUP ACTION
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- MW-8 DECOMMISSIONED MONITORING WELL
- TEST PIT
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

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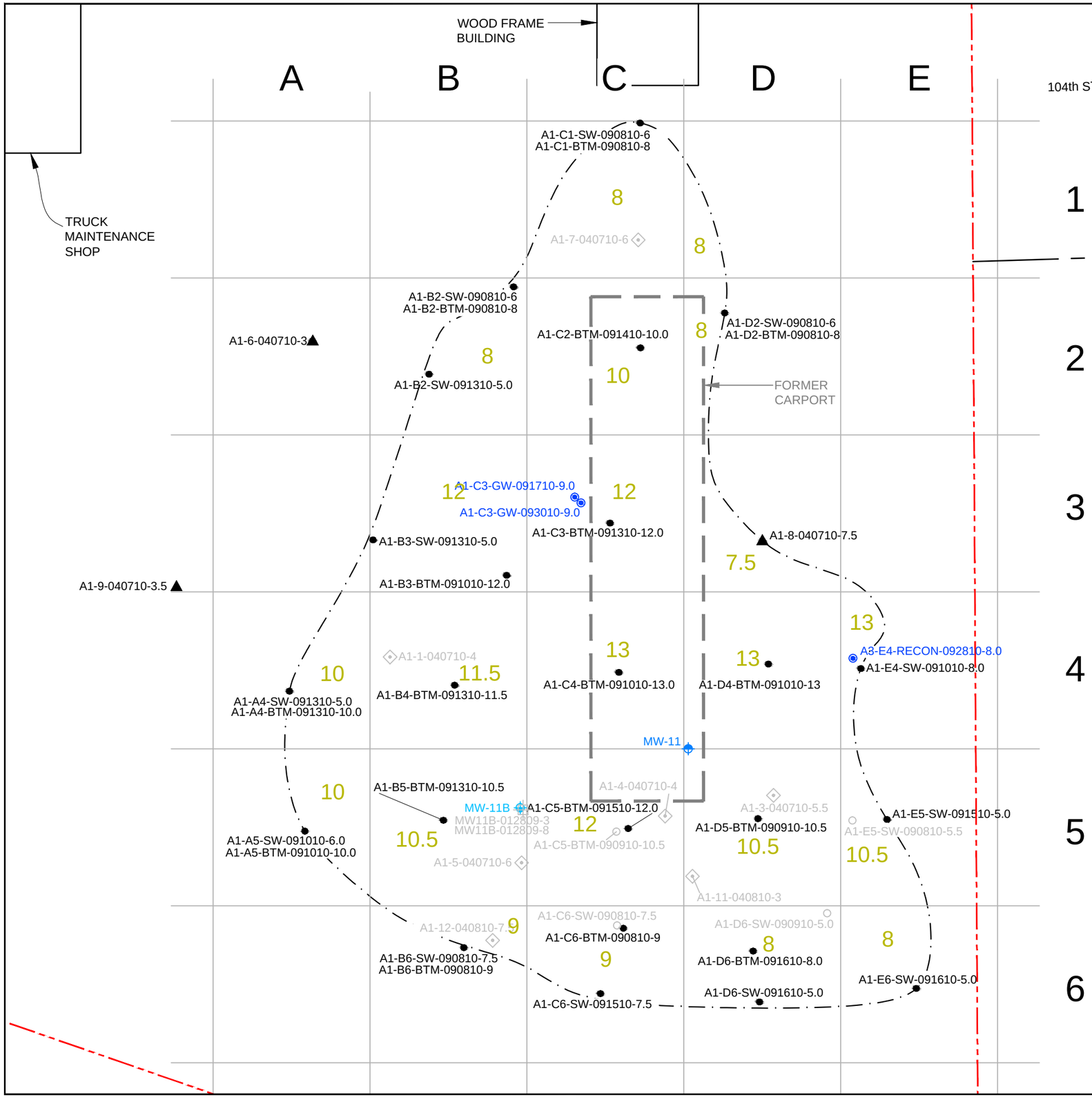
FIGURE 2

SITE PLAN
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 5/9/2016 Disk Reference: 188002b



LEGEND

A / 1	SAMPLING GRID
	WOODWORTH LAKEVIEW FACILITY PROPERTY BOUNDARY
	EXCAVATION LIMITS
A2-1-040710-4	CONFIRMATION SOIL SAMPLE SEPTEMBER 2010
A1-C5-BTM-090910-10.5	PERFORMANCE SOIL SAMPLE SEPTEMBER 2010-EXCAVATED
A1-9-040710-3.5	CONFIRMATION SOIL SAMPLE APRIL 2010-NOT EXCAVATED
A1-1-040710-4	PERFORMANCE SOIL SAMPLE APRIL 2010-EXCAVATED
MW11B-012809-3	REMEDIAL INVESTIGATION PERFORMANCE SOIL SAMPLE JANUARY 2009-EXCAVATED
A1-C3-GW-091710-9.0	EXCAVATION WATER SAMPLE SEPTEMBER 2010
MW-11	MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
MW-11B	MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
13	BASE OF EXCAVATION DEPTH IN FEET BELOW GROUND SURFACE
AOC	AREA OF CONCERN

ALL LOCATIONS ARE APPROXIMATE

0 20
SCALE IN FEET

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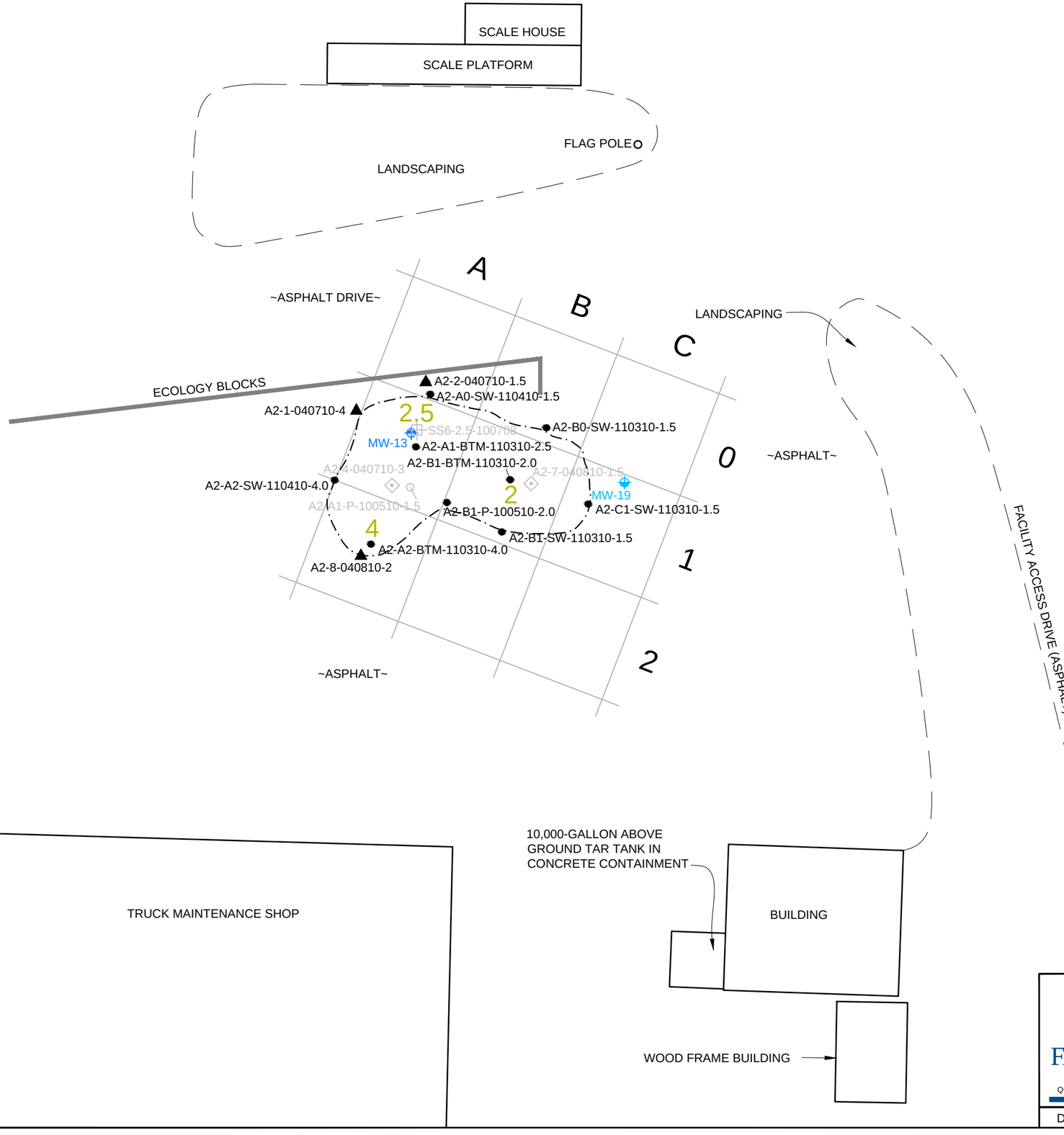
FIGURE 3

AOC 1 SOIL SAMPLE LOCATIONS
LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: GPF | Checked By: BJ | Date: 5/4/2016 | Disk Reference: 188-002aoc



LEGEND

A / 1	SAMPLING GRID
	EXCAVATION LIMITS
A2-A0-SW-110410-1.5	CONFIRMATION SOIL SAMPLE OCTOBER / NOVEMBER 2010
A2-A1-P-100510-1.5	PERFORMANCE SOIL SAMPLE OCTOBER 2010-EXCAVATED
A2-8-040810-2	CONFIRMATION SOIL SAMPLE APRIL 2010-NOT EXCAVATED
A2-4-040710-3	PERFORMANCE SOIL SAMPLE APRIL 2010-EXCAVATED
SS6-2.5-100708	REMEDIAL INVESTIGATION PERFORMANCE SOIL SAMPLE OCTOBER 2009-EXCAVATED
MW-13	MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
MW-19	MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
4	BASE OF EXCAVATION DEPTH IN FEET BELOW GROUND SURFACE
AOC	AREA OF CONCERN

ALL LOCATIONS ARE APPROXIMATE

0 30
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FIGURE 4

AOC 2 SOIL SAMPLE LOCATIONS
LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: GPF Checked By: BJ Date: 5/4/2016 Disk Reference: 188-002aoc

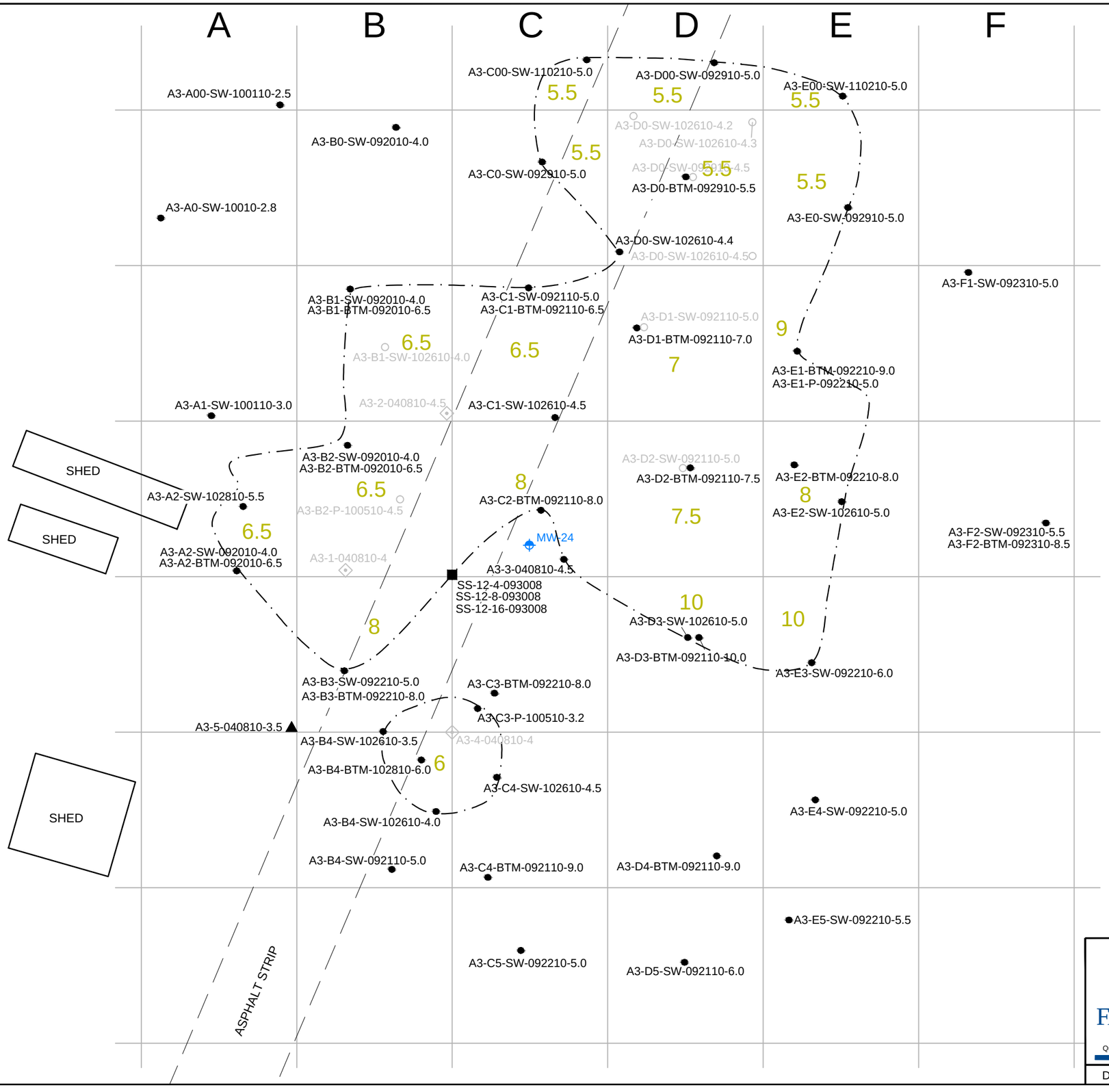

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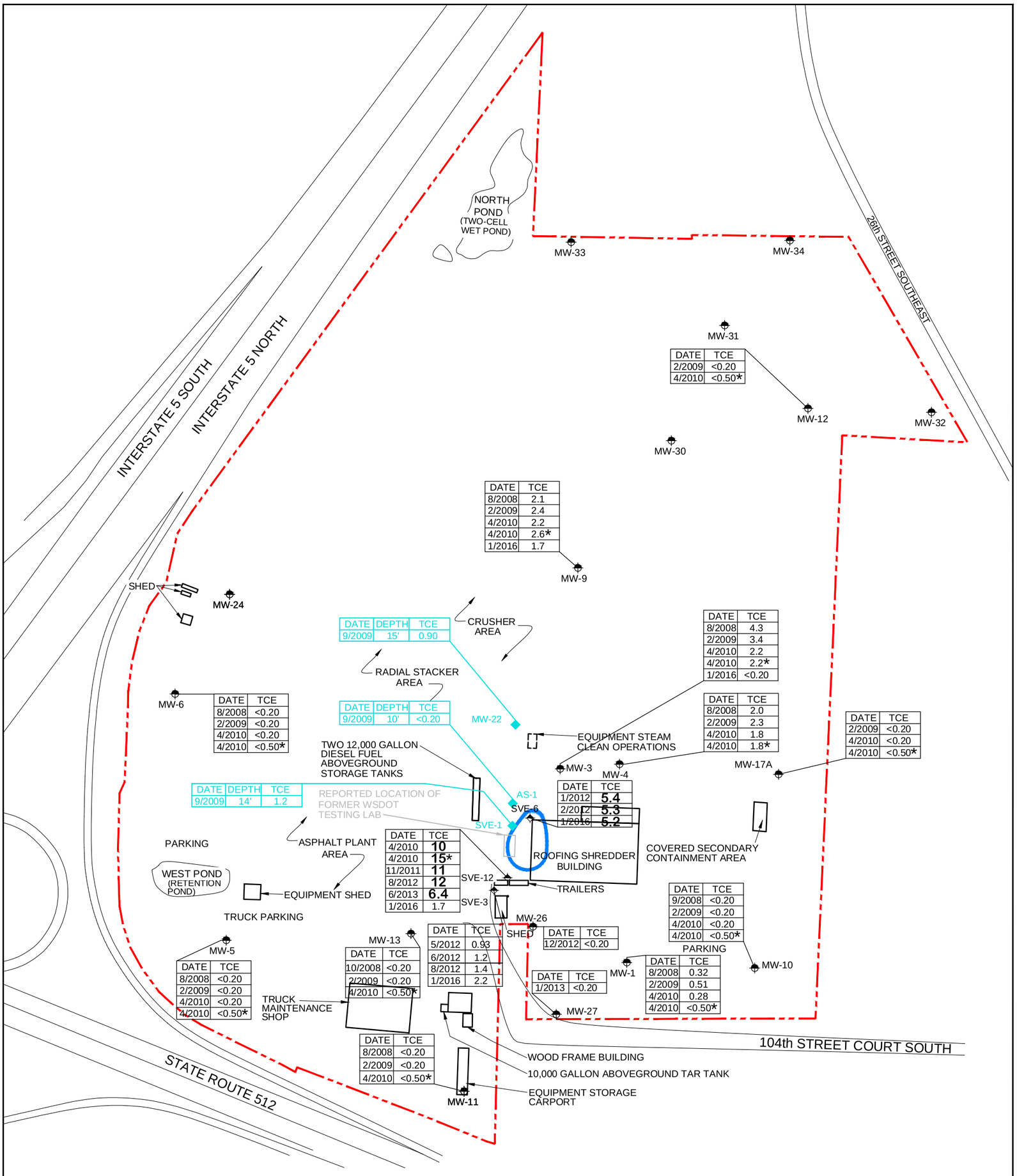
FIGURE 5

AOC 3 SOIL SAMPLE LOCATIONS
LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: GPF | Checked By: BJ | Date: 5/4/2016 | Disk Reference: 188-002aoc



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE EXTENT OF TRICHLOROETHENE (TCE) CONCENTRATION IN GROUNDWATER EXCEEDING THE WASHINGTON STATE MODEL TOXIC CONTROL ACT METHOD A CLEANUP LEVEL OF 5 MICROGRAMS PER LITER
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- SVE-12 SOIL VAPOR EXTRACTION WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- RECONNAISSANCE GROUNDWATER SAMPLE COLLECTED IN SHALLOW WATER-BEARING ZONE
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

0 200
APPROXIMATE SCALE IN FEET

N

NOTES:

1. < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
2. RESULTS IN **BOLD** DENOTE CONCENTRATIONS ABOVE APPLICABLE CLEANUP LEVEL.
3. TCE CONCENTRATIONS FOLLOWED BY " * " ARE THE RESULTS PROVIDED BY GEOENGINEERS, INC. FOR THE APRIL 2010 GROUNDWATER SAMPLING EVENT.
4. ALL RESULTS IN MICROGRAMS PER LITER.
5. DEPTHS ARE INDICATED ARE IN FEET BELOW GROUND SURFACE.
6. RESULTS IN **BLUE** DENOTE RECONNAISSANCE GROUNDWATER SAMPLES

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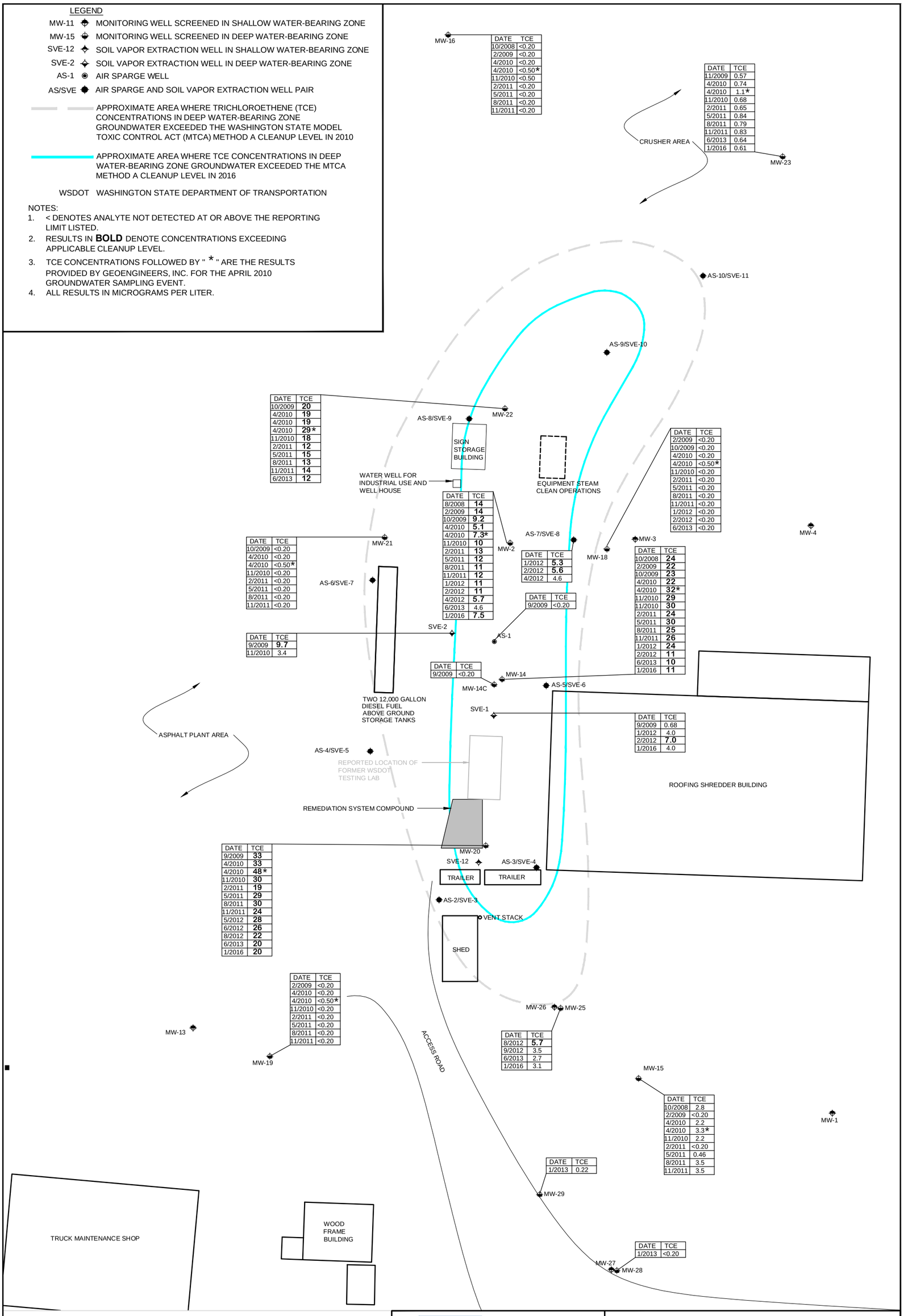
FIGURE 6

TCE CONCENTRATIONS IN
SHALLOW WATER-BEARING ZONE
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DJR Checked By: BJ Date: 2/16/2016 Disk Reference: 188-002b.dwg


LEGEND
MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
SVE-12 SOIL VAPOR EXTRACTION WELL IN SHALLOW WATER-BEARING ZONE
SVE-2 SOIL VAPOR EXTRACTION WELL IN DEEP WATER-BEARING ZONE
AS-1 AIR SPARGE WELL
AS/SVE AIR SPARGE AND SOIL VAPOR EXTRACTION WELL PAIR
APPROXIMATE AREA WHERE TRICHLOROETHENE (TCE) CONCENTRATIONS IN DEEP WATER-BEARING ZONE GROUNDWATER EXCEEDED THE WASHINGTON STATE MODEL TOXIC CONTROL ACT (MTCA) METHOD A CLEANUP LEVEL IN 2010
APPROXIMATE AREA WHERE TCE CONCENTRATIONS IN DEEP WATER-BEARING ZONE GROUNDWATER EXCEEDED THE MTCA METHOD A CLEANUP LEVEL IN 2016
WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
NOTES:
1. < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
2. RESULTS IN BOLD DENOTE CONCENTRATIONS EXCEEDING APPLICABLE CLEANUP LEVEL.
3. TCE CONCENTRATIONS FOLLOWED BY " * " ARE THE RESULTS PROVIDED BY GEOENGINEERS, INC. FOR THE APRIL 2010 GROUNDWATER SAMPLING EVENT.
4. ALL RESULTS IN MICROGRAMS PER LITER.
MW-16
DATE TCE
10/2008 <0.20
2/2009 <0.20
4/2010 <0.20
4/2010 <0.50*
11/2010 <0.50
2/2011 <0.20
5/2011 <0.20
8/2011 <0.20
11/2011 <0.20
CRUSHER AREA
DATE TCE
11/2009 0.57
4/2010 0.74
4/2010 1.1*
11/2010 0.68
2/2011 0.65
5/2011 0.84
8/2011 0.79
11/2011 0.83
6/2013 0.64
1/2016 0.61
MW-23
AS-10/SVE-11
AS-9/SVE-10
DATE TCE
10/2009 20
4/2010 19
4/2010 19
4/2010 29*
11/2010 18
2/2011 12
5/2011 15
8/2011 13
11/2011 14
6/2013 12
MW-22
AS-8/SVE-9
SIGN STORAGE BUILDING
WATER WELL FOR INDUSTRIAL USE AND WELL HOUSE
EQUIPMENT STEAM CLEAN OPERATIONS
DATE TCE
2/2009 <0.20
10/2009 <0.20
4/2010 <0.20
4/2010 <0.50*
11/2010 <0.20
2/2011 <0.20
5/2011 <0.20
8/2011 <0.20
11/2011 <0.20
1/2012 <0.20
2/2012 <0.20
6/2013 <0.20
MW-4
DATE TCE
8/2008 14
2/2009 14
10/2009 9.2
4/2010 5.1
4/2010 7.3*
11/2010 10
2/2011 13
5/2011 12
8/2011 11
11/2011 12
1/2012 11
2/2012 11
4/2012 5.7
6/2013 4.6
1/2016 7.5
MW-2
AS-7/SVE-8
DATE TCE
1/2012 5.3
2/2012 5.6
4/2012 4.6
MW-18
MW-3
DATE TCE
10/2008 24
2/2009 22
10/2009 23
4/2010 22
4/2010 32*
11/2010 29
11/2010 30
2/2011 24
5/2011 30
8/2011 25
11/2011 26
1/2012 24
2/2012 11
6/2013 10
1/2016 11
MW-21
DATE TCE
10/2009 <0.20
4/2010 <0.20
4/2010 <0.50*
11/2010 <0.20
2/2011 <0.20
5/2011 <0.20
8/2011 <0.20
11/2011 <0.20
AS-6/SVE-7
DATE TCE
9/2009 <0.20
AS-1
SVE-2
DATE TCE
9/2009 9.7
11/2010 3.4
DATE TCE
9/2009 <0.20
MW-14
MW-14C
AS-5/SVE-6
TWO 12,000 GALLON DIESEL FUEL ABOVE GROUND STORAGE TANKS
SVE-1
DATE TCE
9/2009 0.68
1/2012 4.0
2/2012 7.0
1/2016 4.0
ASPHALT PLANT AREA
AS-4/SVE-5
REPORTED LOCATION OF FORMER WSDOT TESTING LAB
ROOFING SHREDDER BUILDING
REMEDIATION SYSTEM COMPOUND
DATE TCE
9/2009 33
4/2010 33
4/2010 48*
11/2010 30
2/2011 19
5/2011 29
8/2011 30
11/2011 24
5/2012 28
6/2012 26
8/2012 22
6/2013 20
1/2016 20
MW-20
SVE-12
AS-3/SVE-4
TRAILER
TRAILER
AS-2/SVE-3
VENT STACK
SHED
DATE TCE
2/2009 <0.20
4/2010 <0.20
4/2010 <0.50*
11/2010 <0.20
2/2011 <0.20
5/2011 <0.20
8/2011 <0.20
11/2011 <0.20
MW-13
MW-19
MW-26
MW-25
ACCESS ROAD
DATE TCE
8/2012 5.7
9/2012 3.5
6/2013 2.7
1/2016 3.1
MW-15
DATE TCE
10/2008 2.8
2/2009 <0.20
4/2010 2.2
4/2010 3.3*
11/2010 2.2
2/2011 <0.20
5/2011 0.46
8/2011 3.5
11/2011 3.5
MW-1
DATE TCE
1/2013 0.22
MW-29
TRUCK MAINTENANCE SHOP
WOOD FRAME BUILDING
DATE TCE
1/2013 <0.20
MW-27
MW-28
0
60
APPROXIMATE SCALE IN FEET
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Oregon
Portland | Bend | Baker City
California
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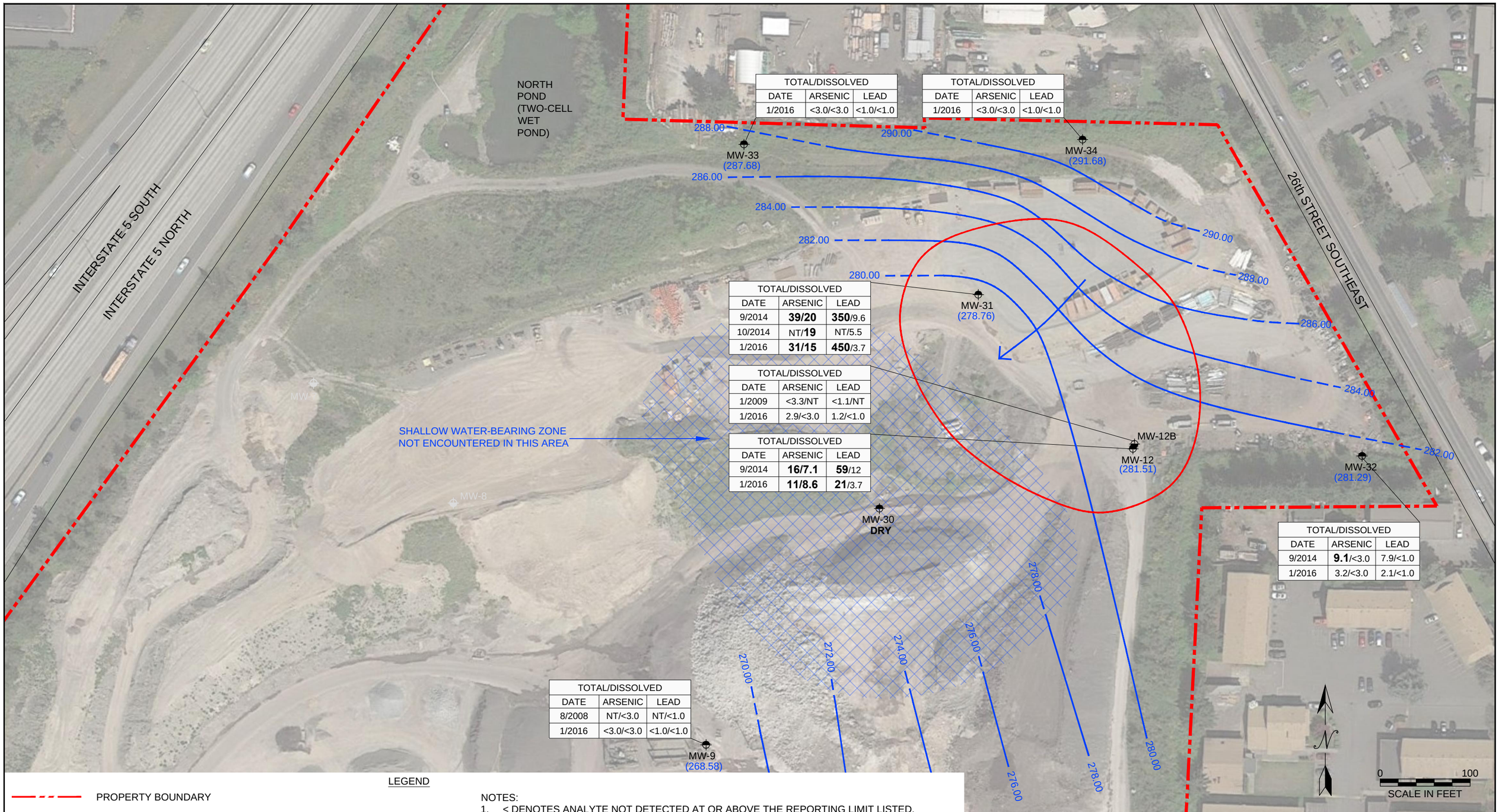
FIGURE 7
TCE CONCENTRATIONS IN DEEP WATER-BEARING ZONE
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON
FARALLON PN: 188-002
Drawn By: DJR
Checked By: BJ
Date: 5/16/2016
Disk Reference: 188-002b.dwg



LEGEND

- PROPERTY BOUNDARY
- MW-11 — MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 — MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- MW-8 — DECOMMISSIONED MONITORING WELL
- FLOW DIRECTION FOR SHALLOW WATER-BEARING ZONE
- (268.58) — GROUNDWATER ELEVATION AT WELL SCREENED IN SHALLOW WATER-BEARING ZONE (JANUARY 2016)
- 288.00 — GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE EXTENT OF ARSENIC AND LEAD CONCENTRATIONS IN GROUNDWATER EXCEEDING CLEANUP LEVEL IN SHALLOW WATER-BEARING ZONE

NOTES:

1. < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
2. RESULTS IN **BOLD** DENOTE CONCENTRATIONS EXCEEDING APPLICABLE CLEANUP LEVEL.
3. ALL RESULTS IN MICROGRAMS PER LITER.
4. AOC = AREA OF CONCERN
5. NT = NOT TESTED

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FIGURE 8

ARSENIC AND LEAD CONCENTRATIONS IN GROUNDWATER
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: GPF Checked By: BJ Date: 5/16/2016 Disk Reference: 188-002.dwg

TABLES

RESPONSE TO LETTER REGARDING ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY
Lakeview Facility
Lakewood, Washington

Farallon PN: 188-002

Table 1
Monitoring Well Elevation Data for Shallow Water-Bearing Zone
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Measurement Date	Casing Elevation (feet msl)[1]	Monument Rim Elevation (feet msl)[1]	Ground Elevation (feet msl)[1]	Total Depth of Well (feet below top of casing)	Screen Interval (feet below ground)	Screen Interval (feet msl)[1]	Depth to Groundwater (feet below top of casing)	Groundwater Elevation (feet msl)[1]
Shallow Monitoring Wells									
MW-1	8/19/2008	313.65	NA	309.57	52.95	48.9 to 33.9	260.7 to 275.7	39.70	273.95
	9/17/2008							40.30	273.35
	10/17/2008							40.71	272.94
	2/2/2009							35.89	277.76
	9/30/2009							39.56	274.09
	4/12/2010							35.65	278.00
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							34.76	278.89
	11/8/2011							38.05	275.60
	11/30/2012							36.43	277.22
	6/12/2013							NM	
	10/23/2014							38.00	275.65
	1/27/2016							35.06	278.59
MW-3	8/19/2008	279.31	279.78	278.20	22.00	20.9 to 7.6	257.3 to 271.7	11.54	267.77
	9/17/2008							12.37	266.94
	10/13/2008							12.26	267.05
	2/2/2009							9.72	269.59
	9/30/2009							10.74	268.57
	4/12/2010							9.67	269.64
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							10.02	269.29
	11/8/2011							10.10	269.21
	6/12/2013							NM	
	10/23/2014							10.18	269.13
	1/27/2016							8.90	270.41
MW-4	8/19/2008	280.77	281.32	279.99	24.73	24.0 to 10.5	256.0 to 270.3	13.73	267.04
	9/17/2008							14.21	266.56
	10/13/2008							14.30	266.47
	2/2/2009							11.73	269.04
	9/30/2009							13.25	267.52
	4/12/2010							11.35	269.42
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							11.95	268.82
	11/8/2011							NM	
	6/12/2013							NM	
	10/23/2014							12.83	267.94
	1/27/2016							NM	

Table 1
Monitoring Well Elevation Data for Shallow Water-Bearing Zone
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Measurement Date	Casing Elevation (feet msl)[1]	Monument Rim Elevation (feet msl)[1]	Ground Elevation (feet msl)[1]	Total Depth of Well (feet below top of casing)	Screen Interval (feet below ground)	Screen Interval (feet msl)[1]	Depth to Groundwater (feet below top of casing)	Groundwater Elevation (feet msl)[1]
MW-5	8/19/2008	282.99	283.26	283.26	16.68	17.0 to 9.9	266.3 to 273.3	11.40	271.59
	9/17/2008							11.23	271.76
	10/13/2008							11.24	271.75
	2/2/2009							8.69	274.30
	9/30/2009							10.47	272.52
	4/12/2010							8.38	274.61
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							9.84	273.15
	11/8/2011							10.22	272.77
	6/12/2013							NM	
	10/23/2014							9.31	273.68
	1/27/2016							8.13	274.86
MW-6	8/19/2008	274.38	274.96	274.96	10.88	11.5 to 4.5	263.5 to 270.5	9.72	264.66
	9/17/2008							8.96	265.42
	10/13/2008							8.98	265.40
	2/2/2009							4.96	269.42
	9/30/2009							8.29	266.09
	4/12/2010							4.50	269.88
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							6.90	267.48
	11/8/2011							7.55	266.83
	6/12/2013							NM	
	10/23/2014							NM	
	1/27/2016							NM	
MW-9	8/19/2008	278.15	278.67	277.17	25.00	24.0 to 17.0	253.2 to 260.2	14.48	263.67
	9/17/2008							14.94	263.21
	10/13/2008							14.79	263.36
	2/2/2009							11.37	266.78
	9/30/2009							13.75	264.40
	4/12/2010							11.00	267.15
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							12.18	265.97
	11/8/2011							12.32	265.83
	6/12/2013							NM	
	10/23/2014	278.06	278.60	277.10			278.1 to 285.1	13.28	264.78
	1/27/2016							9.48	268.58

Table 1
Monitoring Well Elevation Data for Shallow Water-Bearing Zone
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Measurement Date	Casing Elevation (feet msl)[1]	Monument Rim Elevation (feet msl)[1]	Ground Elevation (feet msl)[1]	Total Depth of Well (feet below top of casing)	Screen Interval (feet below ground)	Screen Interval (feet msl)[1]	Depth to Groundwater (feet below top of casing)	Groundwater Elevation (feet msl)[1]
MW-10	8/19/2008	313.18	NA	311.18	41.81	39.8 to 32.8	271.4 to 278.4	36.99	276.19
	9/17/2008							39.42	273.76
	10/13/2008							38.56	274.62
	2/2/2009							33.05	280.13
	9/30/2009							38.60	274.58
	4/12/2010							32.99	280.19
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							NM	
	8/2/2011							36.70	276.48
	11/8/2011							36.93	276.25
	6/12/2013							NM	
	10/23/2014							32.90	280.28
	1/27/2016							NM	
MW-11[2]	8/19/2008	286.70	287.53	287.53	14.46	15.3 to 8.3	272.2 to 279.2	10.38	276.32
	9/17/2008							10.92	275.78
	10/13/2008							11.27	275.43
	2/2/2009							6.20	280.50
	9/30/2009							10.30	276.40
	4/12/2010							6.22	280.48
	11/19/2010							NM	
	2/1/2011	287.13	287.74	287.74	12.11	15.5 to 8.5		6.58	280.55
	5/4/2011							6.40	280.73
	8/2/2011							8.08	279.05
	11/8/2011							9.60	277.53
	11/30/2012							7.30	279.83
	6/12/2013							NM	
	10/23/2014							NM	
	1/27/2016							5.90	281.23
MW-12	10/13/2008	313.32	313.88	313.88	48.15	48.7 to 43.7	265.2 to 270.2	37.20	276.12
	2/2/2009							34.05	279.27
	9/30/2009							37.00	276.32
	1/13/2010							33.60	279.72
	4/12/2010							33.40	279.92
	11/19/2010							35.30	278.02
	2/1/2011							33.24	280.08
	5/4/2011							33.01	280.31
	8/2/2011							35.25	278.07
	11/8/2011							36.63	276.69
	6/12/2013							34.82	278.50
	10/23/2014							36.41	276.91
	1/27/2016							31.81	281.51

Table 1
Monitoring Well Elevation Data for Shallow Water-Bearing Zone
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Measurement Date	Casing Elevation (feet msl)[1]	Monument Rim Elevation (feet msl)[1]	Ground Elevation (feet msl)[1]	Total Depth of Well (feet below top of casing)	Screen Interval (feet below ground)	Screen Interval (feet msl)[1]	Depth to Groundwater (feet below top of casing)	Groundwater Elevation (feet msl)[1]
MW-13	10/13/2008	284.73	284.97	284.97	24.14	24.4 to 14.4	260.6 to 270.6	33.40	251.33
	2/2/2009							16.80	267.93
	9/30/2009							17.44	267.29
	4/12/2010							15.36	269.37
	11/19/2010							NM	
	2/1/2011							14.90	269.83
	5/4/2011							13.80	270.93
	8/2/2011							13.20	271.53
	11/8/2011							14.59	270.14
	11/30/2012							14.84	269.89
	6/12/2013							NM	
	10/23/2014							NM	
	1/27/2016							16.04	268.69
MW-17A	2/2/2009	281.72	282.23	282.23	34.70	35.2 to 25.2	247.0 to 257.0	7.69	274.03
	9/30/2009							10.80	270.92
	4/12/2010							6.66	275.06
	11/19/2010							NM	
	2/1/2011							NM	
	5/4/2011							5.58	276.14
	8/2/2011							7.94	273.78
	11/8/2011							9.46	272.26
	6/12/2013							NM	
	10/23/2014							9.67	272.05
	1/27/2016							NM	
MW-24[3]	10/6/2010	NA	NA	NA	3.55	~ 4 to ~ 2	NA to NA	0.38	
	11/19/2010							NM	
	2/1/2011	277.59	277.92	277.92	7.37	7.7 to 5.7	270.2 to 272.2	3.70[4]	274.22
	5/4/2011							4.03	273.89
	8/2/2011							5.30	272.62
	11/8/2011							4.30	273.62
	6/12/2013							NM	
	10/23/2014							NM	
	1/27/2016							NM	
MW-26	8/6/2012	279.30	279.70	279.70	9.88	10.3 to 2.8	269.4 to 277.0	Dry	
	8/9/2012							Dry	
	9/24/2012							Dry	
	11/30/2012							8.24	271.06
	12/12/2012							7.11	272.19
	12/21/2012							5.52	273.78
	6/12/2013							NM	
	10/23/2014							9.55	269.75
	1/27/2016							6.89	272.41

Table 1
Monitoring Well Elevation Data for Shallow Water-Bearing Zone
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Measurement Date	Casing Elevation (feet msl)[1]	Monument Rim Elevation (feet msl)[1]	Ground Elevation (feet msl)[1]	Total Depth of Well (feet below top of casing)	Screen Interval (feet below ground)	Screen Interval (feet msl)[1]	Depth to Groundwater (feet below top of casing)	Groundwater Elevation (feet msl)[1]
MW-27	1/15/2013	311.97	312.37	312.37	41.75	42.2 to 27.2	270.2 to 285.2	32.21	279.8
	6/12/2013							NM	
	10/23/2014							23.21	288.76
	1/27/2016							31.69	280.28
MW-30	9/10/2014	303.66	304.20	304.20	37.65	38.2 to 28.2	266.0 to 276.0	Dry	
	9/12/2014							Dry	
	10/23/2014							Dry	
	10/30/2014							Dry	
	1/27/2016							Dry	
MW-31	9/10/2014	324.89	325.19	325.19	55.86	56.2 to 46.2	269.0 to 279.0	48.33	276.56
	9/12/2014							48.33	276.56
	10/23/2014							48.75	276.14
	10/30/2014							48.81	276.08
	1/27/2016							46.13	278.76
MW-32	9/10/2014	312.99	313.34	313.34	44.62	45.0 to 35.0	268.4 to 278.4	36.19	276.80
	9/12/2014							36.11	276.88
	10/23/2014							36.15	276.84
	1/27/2016							31.70	281.29
MW-33	1/27/2016	329.87	329.33	329.33	50.70	50.2 to 40.2	279.2 to 289.2	42.19	287.68
MW-34	1/27/2016	329.97	329.47	329.47	50.00	49.5 to 39.5	280.0 to 290.0	38.29	291.68

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Monitoring Well Elevation Data for Shallow Water-Bearing Zone
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Measurement Date	Casing Elevation (feet msl)[1]	Monument Rim Elevation (feet msl)[1]	Ground Elevation (feet msl)[1]	Total Depth of Well (feet below top of casing)	Screen Interval (feet below ground)	Screen Interval (feet msl)[1]	Depth to Groundwater (feet below top of casing)	Groundwater Elevation (feet msl)[1]
Shallow Soil Vapor Extraction Wells									
SVE-3	4/13/2010	284.25	284.71	284.71	33.03	33.5 to 8.5	251.2 to 276.2	12.60	271.65
	5/11/2012							12.75	271.50
	6/13/2012							12.78	271.47
	8/9/2012							13.40	270.85
	11/9/2010							13.01	271.24
	10/23/2014							13.34	270.91
	1/27/2016							12.80	271.45
SVE-5	4/13/2010	281.29	281.70	281.70	37.74	38.2 to 10.2	243.6 to 271.6	10.58	270.71
	11/19/2010							10.90	270.39
	10/23/2014							NM	
	1/27/2016							17.73	263.56
SVE-6	4/13/2010	280.91	281.33	281.33	34.62	35.0 to 10.0	246.3 to 271.3	12.55	268.36
	11/9/2010							13.35	267.56
	1/10/2012							11.49	269.42
	2/13/2012							11.15	269.76
	10/23/2014							11.70	269.21
	1/27/2016							10.38	270.53
SVE-10	4/13/2010	279.11	279.64	279.64	38.45	39.0 to 6.0	240.7 to 273.7	11.50	267.61
	11/9/2010							12.56	266.55
	10/23/2014							NM	
	1/27/2016							NM	
SVE-12	4/13/2010	281.99	282.51	282.51	19.35	19.9 to 4.9	262.6 to 277.6	11.24	270.75
	11/9/2010							11.64	270.35
	11/8/2011							11.66	270.33
	8/9/2012							12.01	269.98
	11/30/2012							11.55	270.44
	10/23/2014							11.96	270.03
	1/27/2016							11.00	270.99

NOTES:

[1] Feet above mean sea level (msl).

[2] Monitoring well casing shortened or extended due to change in grade. The new top of casing elevation was resurveyed by Farallon.

[3] Monitoring well MW-24 initially was constructed nearly 4 feet below the current ground surface. The well casing was extended to just below the current ground surface in January 2010. The new top of casing and rim elevations were resurveyed by Farallon.

[4] Measured from monument rim.

bgs = below ground surface
Farallon = Farallon L.L.C.
NA = not available
NM = not measured

Table 2
Groundwater Analytical Results for AOCs 1, 2, and 3
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Area of Concern	Water-Bearing Zone	Sample Identification	Sample Date	Analytical Results (micrograms per liter)						
					GRO[1]	DRO[2]	ORO[2]	Benzene[3]	Toluene[3]	Ethylbenzene[3]	Total Xylenes[3]
MW-11	AOC 1	Shallow	MW11-081908	8/19/2008	<100	<230	<360	<0.2	<1.0	<0.2	<0.2
			MW11-020609	2/6/2009	<100	**1,000**	<410	<1.0	<1.0	<1.0	<1.0
			MW11-041310	4/13/2010	—	320	<410	—	—	—	—
			MW11-020111	2/1/2011	—	<260	<420	—	—	—	—
			MW11-050311	5/3/2011	—	<260	<420	—	—	—	—
			MW11-080211	8/2/2011	—	<280	<440	—	—	—	—
			MW11-110811	11/8/2011	—	<260	<420	—	—	—	—
MW-13	AOC 2	Shallow	MW13-101408	10/14/2008	<100	<250	<400	<1.0	<1.0	<1.0	<1.0
			MW13-041310	4/13/2010	—	<260	<410	—	—	—	—
			MW13-020111	2/1/2011	—	<270	<440	—	—	—	—
MW-24	AOC 3	Shallow	MW24-100610	10/6/2010	—	<260	<420	—	—	—	—
			MW24-020111	2/1/2011	—	<260	<410	—	—	—	—
			MW24-050411	5/4/2011	—	<260	<420	—	—	—	—
			MW24-080211	8/2/2011	—	<270	<430	—	—	—	—
MTCA Method A Cleanup Levels[4]					**1,000** [5]	**500**	**500**	**5**	**1,000**	**700**	**1,000**

NOTES:

Results in **bold** denote concentrations exceeding applicable cleanup levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

[1]Analyzed by Northwest Method NWTPH-Gx.

[2]Analyzed by Northwest Method NWTPH-Dx.

[3]Analyzed by U.S. Environmental Protection Agency Method 8260B.

[4] Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

[5]The cleanup level for GRO is without the presence of benzene.

AOCs = Areas of Concern

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

GRO = TPH as gasoline-range organics

ORO = TPH as oil-range organics

Table 3
Groundwater Analytical Results for AOC 4
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Sample Identification	Sample Date	Analytical Results (micrograms per liter)[1]					
			Tetrachloroethene	Trichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	1,1-dichloroethene	Vinyl Chloride
SVE-12 (Shallow Water-Bearing Zone)	SVE-12-041310	4/13/2010	0.37	**10**	<0.20	<0.20	0.47	<0.20
	SVE-12-110911	11/9/2011	0.24	**11**	<0.20	<0.20	4.4	<0.20
	SVE-12-080912	8/9/2012	0.26	**12**	<0.20	<0.20	5.9	<0.20
	SVE-12-061213	6/12/2013	<0.20	**6.4**	<0.20	<0.20	4.1	<0.20
	SVE-12-012916	1/29/2016	<0.20	1.7	<0.20	<0.20	<0.20	<0.20
MW-2 (Deep Water-Bearing Zone)	MW2-082008	8/20/2008	<0.20	**14**	<0.20	<0.20	<0.20	<0.20
	MW2-021209	2/12/2009	<0.20	**14**	<0.20	<0.20	<0.20	<0.20
	Dup2-021209	2/12/2009	<0.20	**14**	<0.20	<0.20	<0.20	<0.20
	MW2-100109	10/1/2009	<0.20	**9.2**	<0.20	<0.20	<0.20	<0.20
	MW2-041310	4/13/2010	<0.20	**5.1**	<0.20	<0.20	<0.20	<0.20
	MW-2-110410	11/4/2010	<0.20	**10**	<0.20	<0.20	<0.20	<0.20
	MW-2-020111	2/1/2011	<0.20	**13**	<0.20	<0.20	0.54	<0.20
	MW-2-050411	5/4/2011	<0.20	**12**	<0.20	<0.20	0.51	<0.20
	MW-2-080211	8/2/2011	<0.20	**11**	<0.20	<0.20	0.45	<0.20
	MW-2-1108211	11/8/2011	<0.20	**12**	<0.20	<0.20	0.32	<0.20
	MW-2-011012	1/10/2012	<0.20	**11**	<0.20	<0.20	0.44	<0.20
	MW-2-021312	2/13/2012	<0.20	**11**	<0.20	<0.20	0.39	<0.20
	MW-2	4/10/2012	<0.20	**6.7**	<0.20	<0.20	0.34	<0.20
	MW-2-061213	6/12/2013	<0.20	4.6	<0.20	<0.20	<0.20	<0.20
	MW-2-012816	1/28/2016	<0.20	**7.5**	<0.20	<0.20	<0.20	<0.20
MW-14 (Deep Water-Bearing Zone)	MW-14-101308	10/13/2008	<0.20	**24**	<0.20	<0.20	3.5	<0.20
	MW-14-021209	2/12/2009	<0.20	**22**	<0.20	<0.20	2.0	<0.20
	MW-14-100109	10/1/2009	<0.20	**23**	<0.20	<0.20	2.2	<0.20
	MW-14-041310	4/13/2010	<0.20	**22**	<0.20	<0.20	2.2	<0.20
	MW-14-110410	11/4/2010	<0.20	**29**	<0.20	<0.20	3.4	<0.20
	MW-14-110410-X	11/4/2010	0.21	**30**	<0.20	<0.20	3.7	<0.20
	MW-14-020111	2/1/2011	<0.20	**24**	<0.20	<0.20	2.7	<0.20
	MW-14-050411	5/4/2011	<0.20	**30**	<0.20	<0.20	3.8	<0.20
	MW-14-080311	8/3/2011	<0.20	**25**	<0.20	<0.20	2.4	<0.20
	MW-14-110811	11/8/2011	<0.20	**26**	<0.20	<0.20	2.2	<0.20
	MW-14-011012	1/10/2012	<0.20	**24**	<0.20	<0.20	2.2	<0.20
	MW-14-021312	2/13/2012	<0.20	**11**	<0.20	<0.20	1.6	<0.20
	MW-14-061213	6/12/2013	<0.20	**10**	<0.20	<0.20	0.75	<0.20
	MW-14-012816	1/28/2016	<0.20	**11**	<0.20	<0.20	1.3	<0.20

Table 3
Groundwater Analytical Results for AOC 4
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Sample Identification	Sample Date	Analytical Results (micrograms per liter)[1]					
			Tetrachloroethene	Trichloroethene	cis-1,2-dichloroethene	trans-1,2-dichloroethene	1,1-dichloroethene	Vinyl Chloride
MW-20 (Deep Water-Bearing Zone)	MW20-093009	9/30/2009	<0.20	**33**	<0.20	<0.20	0.43	<0.20
	MW20-041310	4/13/2010	<0.20	**33**	0.21	<0.20	0.47	<0.20
	MW-20-110410	11/4/2010	0.27	**30**	<0.20	<0.20	0.36	<0.20
	MW-20-020111	2/1/2011	<0.20	**19**	<0.20	<0.20	0.22	<0.20
	MW-20-050311	5/3/2011	<0.20	**29**	<0.20	<0.20	0.40	<0.20
	MW-20-080311	8/3/2011	<0.20	**30**	<0.20	<0.20	0.46	<0.20
	MW-20-110811	11/8/2011	<0.20	**24**	0.20	<0.20	0.25	<0.20
	MW-20-051112	5/11/2012	<0.20	**28**	<0.20	<0.20	0.31	<0.20
	MW-20-061312	6/13/2012	<0.20	**26**	<0.20	<0.20	0.36	<0.20
	MW-20-080912	8/9/2012	<0.20	**22**	<0.20	<0.20	0.24	<0.20
	MW-20-061213	6/12/2013	<0.20	**20**	<0.20	<0.20	<0.20	<0.20
	MW-20-012916	1/29/2016	<0.20	**20**	<0.20	<0.20	<0.20	<0.20
MW-22 (Deep Water-Bearing Zone)	MW22-100109	10/1/2009	<0.20	**20**	<0.20	<0.20	1.6	<0.20
	MW22-041210	4/12/2010	<0.20	**19**	<0.20	<0.20	1.4	<0.20
	FD-041210	4/12/2010	<0.20	**19**	<0.20	<0.20	1.5	<0.20
	MW-22-110410	11/4/2010	<0.20	**18**	<0.20	<0.20	1.2	<0.20
	MW-22-020111	2/1/2011	<0.20	**12**	<0.20	<0.20	0.59	<0.20
	MW-22-050411	5/4/2011	<0.20	**15**	<0.20	<0.20	0.94	<0.20
	MW-22-080311	8/2/2011	<0.20	**13**	<0.20	<0.20	0.61	<0.20
	MW-22-110811	11/8/2011	<0.20	**14**	<0.20	<0.20	0.65	<0.20
	MW-22-061213	6/12/2013	<0.20	**12**	<0.20	<0.20	0.45	<0.20
MTCA Cleanup Levels[2]			**5**	**5**	**16[3]**	**160[3]**	**400[3]**	**0.2**

NOTES:

Results in **bold** denote concentrations exceeding applicable cleanup levels.

AOC = Area of Concern

< denotes analyte not detected at or exceeding the reporting limit listed.

[1] Analyzed by U.S. Environmental Protection Agency Method 8260B/C.

[2] Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

[3] MTCA Cleanup Levels and Risk Calculations, Version 3.1, Standard Method B Values for Groundwater, https://fortress.wa.gov/ecy/clarc/Reporting/ChemicalQuery.aspx

Table 4
Groundwater Analytical Results for AOC 5
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Water-Bearing Zone	Sample Identification	Sample Date	Analytical Results (micrograms per liter)[1]			
				Arsenic		Lead	
				Total	Dissolved	Total	Dissolved
MW-30	Shallow	—	9/12/2014	Dry -- No Groundwater Sample Collected			
		—	10/30/2014	Dry -- No Groundwater Sample Collected			
		—	1/28/2016	Dry -- No Groundwater Sample Collected			
MW-31	Shallow	MW-31-091214	9/12/2014	**39**	**20**	**350**	9.6
		MW-31-103014	10/30/2014	**—**	**19**	**—**	5.5
		MW-31-012716	1/27/2016	**31**	**15**	**450**	3.7
MW-32	Shallow	MW-32-091214	9/12/2014	**9.1**	<3.0	7.9	<1.0
		MW-32-012816	1/28/2016	3.2	<3.0	2.1	<1.0
MW-33	Shallow	MW-33-012916	1/29/2016	<3.0	<3.0	<1.0	<1.0
MW-34	Shallow	MW-34-012916	1/29/2016	<3.0	<3.0	<1.0	<1.0
MW-12	Shallow	MW12-101408	10/14/2008	**11**	**8.2**	**50**	**29**
		MW12-020609	2/6/2009	**15**	**18**	**22**	6.1
		MW12-011310	1/13/2010	**9.2**	**9.3**	6.8	7.1
		MW12-041310	4/13/2010	**9.1**	**9.1**	4.5	3.5
		MW12-111910	11/19/2010	**7.7**	**—**	14	**—**
		MW12-020111	2/1/2011	**11**	**—**	6	**—**
		MW12-050311	5/3/2011	**16**	**12**	11	**—**
		MW12-080211	8/2/2011	**8.6**	**6.5**	**35**	**25**
		MW-12-1110211	11/10/2011	**9.5**	**—**	**22**	**—**
		MW-12-061313	6/13/2013	**8.4**	**8.4**	**17**	13
		MW-12-091214	9/12/2014	**16**	**7.1**	**59**	12
		MW-12-012716	1/27/2016	**11**	**8.6**	**21**	3.7
MW-12B	Deep	MW12B-021209	1/12/2009	<3.3	—	<1.1	—
		MW-12B-012716	1/27/2016	2.9	<3.0	1.2	<1.0
MW-9	Shallow	MW9-082008	8/20/2008	—	<3.0	—	<1.0
		MW-9-012816	1/28/2016	<3.0	<3.0	<1.0	<1.0
MTCA Method A Cleanup Levels[2]				**5**		**15**	

NOTES:

Results in **bold** denote concentrations exceeding applicable cleanup levels.

AOC = Area of Concern

— denotes sample not analyzed

[1]Analyzed by U.S. Environmental Protection Agency Method 200.8.

[2]Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

Table 5
Soil Analytical Results for AOC 5
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Boring/Monitoring Well Identification	Sample Identification	Sample Date	Depth (feet bgs)[1]	Analytical Results (milligrams per kilogram)[2]	
				Arsenic	Lead
Borings					
MW-30	MW-30-3.0	9/9/2014	3	<15	20
	MW-30-29.0	9/9/2014	29	<11	31
	MW-30-37.0	9/9/2014	37	<12	<5.8
MW-31	MW-31-3.0	9/8/2014	3	<11	<5.5
	MW-31-45.0	9/8/2014	45	<11	49
	MW-31-55.0	9/8/2014	55	<12	11
MW-32	MW-32-3.0	9/8/2014	3	<12	9.4
	MW-32-37.0	9/8/2014	37	<11	<5.3
	MW-32-45.0	9/8/2014	45	<12	<6.2
MW-33	MW-33-1.5-012516	1/25/2016	1.5	<12	33
	MW-33-22.5-012516	1/25/2016	22.5	<11	<5.6
	MW-33-43.0-012516	1/25/2016	43	<11	<5.3
MW-34	MW-34-2.5-012516	1/25/2016	2.5	<12	28
	MW-34-22.5-012516	1/25/2016	22.5	<11	<5.7
	MW-34-41.5-012516	1/25/2016	41.5	<11	<5.4
SS-9 (MW-12)	SS9-28-100208	10/2/2008	28	<11	28
MW-12B	MW12B-012109-33	1/21/2009	33	<12	46
SS-7	SS7-15-100108	10/1/2008	15	<12	10
Test Pits					
TP-1	TP1-020309-6	2/3/2009	6	<12	14
TP-2	TP2-020309-6	2/3/2009	6	<13	98
TP-3	TP3-020309-3	2/3/2009	3	<11	18
TP-4	TP4-020309-7	2/3/2009	7	<13	15
TP-5	TP5-020309-7	2/3/2009	7	<11	13
TP-6	TP6-020309-14	2/3/2009	14	15	51
TP-7	TP7-020309-10	2/3/2009	10	<11	<5.7
TP-8	TP8-020309-4	2/3/2009	4	<11	10
TP-9	TP9-020309-5	2/3/2009	5	<11	21
TP-10	TP10-020309-6	2/3/2009	6	<11	<5.3
MTCA Method A Cleanup Levels[3]				**20**	**250**

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

AOC = Area of Concern

[1] Depth in feet below ground surface (bgs).

[2] Analyzed by U.S. Environmental Protection Agency (EPA) Method 6020/6010C.

[3] Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised 2013.

Table 6
Natural Attenuation Parameters and Geochemical Indicators
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Well Identification	Sample Identification	Sample Date	Dissolved Oxygen[1] (mg/l)	pH[1]	Temperature[1] (Degrees Celsius)	Specific Conductance[1] (mS/cm)	ORP[1] (mV)
MW-9	MW9-020309	2/3/2009	1.54	6.75	11.56	0.333	125.0
	MW-9-012816	1/28/2016	0.99	6.53	12.97	0.202	204.0
MW-12	MW12-020609	2/6/2009	0.35	9.15	9.90	0.714	-99.5
	MW-12-012716	1/27/2016	2.77	8.74	13.87	0.439	-191.0
MW-31	MW-31-012716	1/27/2016	1.72	11.44	14.00	0.648	-38.0
MW-32	MW-32-012816	1/28/2016	5.15	5.84	13.49	0.117	260.0
MW-33	MW-33-012916	1/29/2016	5.09	6.37	11.34	0.086	230.0
MW-34	MW-34-012916	1/29/2016	4.99	6.23	12.98	0.066	239.0
MW-12B	MW12B-021209	2/12/2009	5.41	7.07	11.35	0.243	105.9
	MW-12B-012716	1/27/2016	5.84	7.15	13.72	0.167	-61.0

NOTES:

[1]Collected using a YSI or HORIBA multimeter and flow-through cell.

mg/l = milligrams per liter

mS/cm = milliSiemens per centimeter specific conductance units

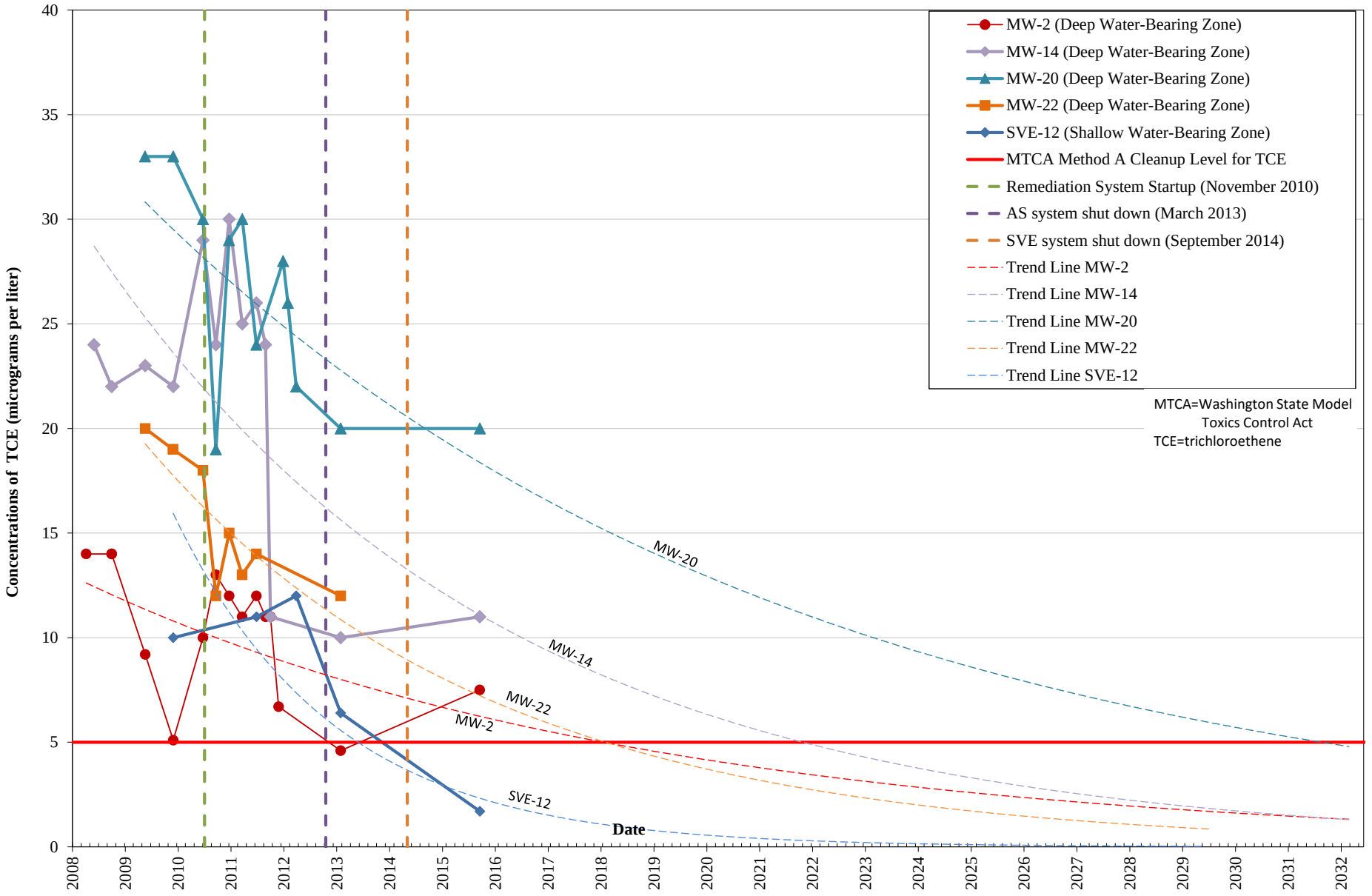
mV = millivolt units for measurement of oxidation-reduction potential (ORP)

CHART

RESPONSE TO LETTER REGARDING ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY
Lakeview Facility
Lakewood, Washington

Farallon PN: 188-002

Chart 1
TCE in Groundwater Concentration Trends
Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002



ATTACHMENT A
ECOLOGY LETTERS

RESPONSE TO LETTER REGARDING ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY
Lakeview Facility
Lakewood, Washington

Farallon PN: 188-002

ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY

Thank you for meeting with Farallon on December 16, 2015 and discussing cleanup action at the Woodworth Lakeview Facility (VCP ID NO: SW 1012). As a follow up, provided herein is a brief summary of the meeting ~~and work elements to be implemented to meet the requirements for the No Further Action determination for the facility~~.

Commented [TS(1]: The purpose of the summary is not to act as a NFA or Likely NFA Opinion.

Ecology representatives included: Jason Cook, Nnamdi Madakor, Steve Teel, Sue La Voie, Richelle Perez, and Eugene Radcliff (on the phone).

Farallon representing Woodworth Capital, Inc.: Peter Jewett and Brani Jurista

- Farallon understands that Eugene Radcliff may take over site management duties from Jason Cook.
- Discussed site and project history, the conceptual site model, and exposure pathways.
- Considered splitting the property into 3 separate VCP sites.
- Issues not discussed during meeting but arose subsequently after non-billable review of project documents by Eugene Radcliff (ER).

Commented [er2]: Ecology considers this a possible scenario as long as contamination from the three areas is not comingled. This option would simplify the review process and make the project more manageable for a VCP site manager.

Based on the discussions with Ecology and the comments in Ecology's October 6, 2015 Opinion Letter, Farallon will prepare a Work Plan to complete the following scope of work:

Area of Concern (AOC) 1, 2, and 3 (Petroleum)

- The existing VCP Site identification is to be used ~~to obtain an NFA~~ for these 3 areas.
- Monitoring Wells MW- 11, MW-13, and MW-24 were not screened at the proper interval to confirm compliance with applicable MTCA Method A Groundwater Cleanup Levels (CULs). (ER)
- From Farallon's April 14, 2014 *Focused Feasibility Study And Disproportionate Cost analysis Report* and March 28, 2011 *Soil Excavation Cleanup Action Report Completion Report*, the Boring Log for MW-13 does match the well screen data for supplied in Table 5. (ER)
- Groundwater analysis for diesel-range (TPH-D) and oil-range (TPH-O) hydrocarbons using NWTPH-Dx with a silica gel/acid cleanup is not allowed (except in limited cases). All future NWTPH-Dx groundwater sample analyses are to be run without the silica gel/acid cleanup. (ER)
- Farallon sampled 127 soil samples from Area 1, Area 2, and Area 3. Of those samples, 40 sample results exceeded the applicable MTCA Method A CULs for diesel-range and/or oil-range hydrocarbons. Only one sample each from Areas (AOCs) 2 and 3 were sampled for carcinogenic polychlorinated aromatic hydrocarbons (cPAHs) and no samples were analyzed for polychlorinated biphenyls (PCBs). These cPAH samples were collected from soils samples that did not have diesel-range and oil-range hydrocarbons above the applicable CULs but were detected above the reporting limits. No soil sample was collected nor analyzed for cPAHs in AOC 1. Ecology does not consider two samples being analyzed for cPAHs as adequate, let alone representative, of the areas investigated. PAHs and PCBs are commonly found in asphalt, asphalt sealants, and

reclaimed asphalt, please provide a rationale for not evaluating theses constituents of concern (COCs). (ER)

- Provide images or elevation drawings of the completed excavations. (ER)
- New wells will have to be installed in AOCs 1, 2, and 3. (ER)

- Groundwater COCs are TPH-D and TPH-O (without silica gel cleanup), cPAHs, and PCBs. (ER)

- ~~Ecology concurs agrees that Farallon may request review of the cleanup for AOC 1, 2, & 3 by compiling the data and requesting an opinion that the cleanup action at these areas are sufficient for an NFA for AOC 1 through 3~~.

- ~~Prepare a request to obtain an NFA for AOC 1 through 3.~~

AOC 4 (TCE)

- Further TCE source identification in the area of the reported WSDOT mobile lab location

    - The TCE MTCA Method B Groundwater CUL is 4 micrograms per liter (see online CLARC Guidance).

    - ~~Soil sample collection in the TCE source area (see Ecology's comment #1 from the Opinion Letter)~~

    - Quarterly groundwater sampling (see Ecology's comment #2 from the Opinion Letter).). In addition, no demonstration has be provided to confirm that natural attenuation is indeed occurring at the Site. Missing from the discussion are a plume stability analysis, geochemical indicators, and long-term groundwater data to substantiate that assumption. (ER)

    - Perform enhanced a soil gas survey of the TCE source area (see also Ecology's comment #3 from the Opinion Letter).

    - Based on the conceptual discussion at the meeting, Ecology recommended additional discussion in the feasbility study based on the results of further source identification such as adding alternatives remedies or including more discussion of the geology that justifies the use of specific alternatives.

    - ~~.~~

    - ~~If the soil gas survey indicates potential source area(s), collect soil samples from the aquitard (12 to 20 feet bgs) below the shallow perched water-bearing zone.~~

    - Sufficiently characterize the interrelationship between the shallow, deep, and regional aquifers (see Ecology comment #7 from the Opinion Letter).

- Industrial Water Well

Commented [er3]: Ecology does not agree that Farallon should request a review of the cleanup for AOC 1, 2, and 3 at this time. Diesel-range and oil-range hydrocarbons plus cPAHs in groundwater in these areas have not been adequately characterized. Please address all comments above and provide Ecology with a work plan for review and comment. (ER)

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Commented [er4]: Ecology has determined the TCE source area(s) has not been adequately delineated in the vertical or horizontal extents. The need for additional soil sample analysis collection in and around the TCE source area as depicted in Figure 7 of the *Focused Feasibility Study And Disproportionate Cost Analysis Report* dated April 14, 2014 (see Ecology's comment #1 for detail in the 2015 Further Action Opinion Letter).

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- Perform aquifer test for the regional aquifer and the deep water-bearing zone (pump from industrial water well and monitor response in deep water-bearing zone wells).

- Ecology agrees that additional data can be collected before deciding on whether or not the industrial water well be decommissioned (Ecology comment #4 from the Opinion Letter).

- If there is response, perform a Wellhead Protection Area modeling in order to determine an appropriate location for a replacement industrial well and then decommission the existing industrial well and install a replacement well.

- ~~o~~ Please reconcile the two statements from the Focused Feasibility Study And Disproportionate Cost Analysis Report dated April 14, 2014. First, in Section 4.2, "Shallow and deep groundwater at the Site were impacted by the releases of TCE attributed to past operations and practices of using TCE in the asphalt-testing process by a former WSDOT mobile testing laboratory." And the second statement in Section 4.4.2, " Off-Site sources of TCE that may be affecting groundwater in shallow and deep water-bearing zones on the Site are defined by the detection of TCE at concentrations less than the MTCA Method A cleanup level in up-gradient monitoring wells MW-1, MW-15, and MW 29 (Figure 6)." If there is evidence to support the second statement then please provide it to Ecology for review. Ecology suggests installing a deep and shallow well up gradient of the Site between the assumed off-Site source and the Woodworth Site to aid in that determination.

- ~~Vapo~~r Intrusion
  - ~~Ecology agrees with Farallon's explanation and sufficiency of assessment based on the following:~~
    - ~~Currently there are no buildings for human occupancy or residences within 100 feet from the TCE groundwater plume.~~
    - ~~Site currently is used as an industrial facility and it is zoned industrial. TCE concentrations in shallow groundwater do not exceed the industrial Method C screening level and therefore vapor intrusion is an incomplete pathway.~~

- The results of the proposed soil and soil gas sampling from the TCE source area are important in evaluating the potential for vapor intrusion at the Site for both current and future land use scenarios.

- Prepare a new VCP application for AOC 4 (the TCE area).

- Following the collection of all supplemental RI data requested by Ecology, p~~P~~repare an addendum to the Focused Feasibility Study/Disproportionate Cost Analysis Report (FFS/DCA Report) to modify/update the vapor intrusion assessment based on the above and include additional cleanup alternatives for TCE in soil (if detected) and shallow groundwater.

AOC 5 (Arsenic and Lead)

Commented [TS(5]: Aquifer testing was merely mentioned by Farallon as a possible option during the meeting to support Farallon's assertion that decommissioning of the industrial well was not needed. Farallon also suggested that a "clean" lens of groundwater (for example well MW-14C as shown on cross-section A-A' in Figure 7) separates the deep TCE plume from the industrial water well. Before Ecology can agree and/or recommend aquifer testing, the specifics of the proposed test plan would need to be presented for review. Additional quarterly sampling of MW-14C should also be performed. Ecology also recommends that water samples from MW-14C also be collected as part of the proposed aquifer test. MW-14C has only been sampled once in September 2009 so there is uncertainty about contaminant concentrations at the base of the aquifer immediately above the industrial well. However, nearby well MW-14 (within the plume) has been sampled 10 times since September 2009. Please also present to Ecology the proposed list of wells to be included in the quarterly sampling events.

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Commented [TS(6]: This was not an agreement that was reached in the meeting. Soil gas sampling in the source area is needed to help determine if source area soil contamination is present.

- Define the full extent of the total arsenic and lead groundwater plume (see Ecology comment #5 from the opinion letter). Install 2 monitoring wells along the northern property boundary in the shallow water-bearing zone northeast and northwest of monitoring well MW-31. Install additional wells as necessary to delineate the plume.

- Please provide geochemical data to support assertion that "fill material may have created geochemical reducing conditions."

- Please provide a new AOC 5 map depicting monitoring well, boring, ASV well, and test pit locations on a base map indication the elevation of the sampling locations. This is needed to help determine what, if any impacts, depth of fill and its distribution may have had on releasing metals to groundwater contributing to elevated metal concentrations in groundwater. Lidar images are available for the Site.

- Collect a grab groundwater sample from the off-property area to the east.

- Sample groundwater for total and dissolved arsenic and lead at the two new wells and in the existing groundwater wells during quarterly sampling.

- Prepare a new VCP application for AOC 5.

- ~~If the extent of arsenic and lead is defined, prepare an addendum to the FFS/DCA Report and request a Conditional NFA with Environmental Covenant prohibiting the use of groundwater within AOC 5.~~

Focused Feasibility Study/Disproportionate Cost Analysis (FFS/DCA)

1. The FFS/DCA should be put on hold.

2. Once Ecology has determined the contamination is characterized and fully defined prepare an addendum to the FFS/DCA for Ecology review. Ecology will make the final determination on all proposed applicable CULs, proposed COCs, proposed remedial alternative and disproportionate cost analysis, all proposed points of compliance, proposed reasonable restoration time frames, types of institutional or engineered controls.

3. Modify/update the vapor intrusion assessment based on the above comments and additional investigations and include any revisions to the cleanup alternatives for TCE in soil (as needed) and shallow groundwater.

Other Items of Note

1) Please review reports for typos or other erroneous text or data. These items cause confusion and delays in our review process.

   a) Please explain the reference in *Focused Feasibility Study And Disproportionate Cost Analysis Report* dated April 14, 2014 on page 1-1, second paragraph, last sentence "The selected cleanup action approved by the Washington State Department of Ecology (2010; 2011) was implemented between 2010 and 2013 by the former owner of the Site, Woodworth and

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Company, Inc., as an independent remedial action under the Ecology Voluntary Cleanup Program (*VCP Identification No. NW 2600*)".

b) Table 3 in FFS/DCA is listed as "Soil Analytical Results for AOC 5" when data was clearly referring to AOC 4.

c) Laboratory reports being inserted into FFS/DCA upside down.

2) Maps were vague, in some cases, lacking sufficient detail or narrative to fully or clearly depict what information was intended to be displayed. If the data presented is not clear then too much time is wasted by the reviewer trying to decipher the data and re-interpret the presentation, which should be able to stand alone. For instance:

a) The 2015 FFS/DCA geologic representation of cross-section D-D' cannot be supported by the data points used. The spatial distribution of the data points is much greater than geologic structures expected from this geologic depositional regime; too much detail could be missed.

b) Figure 3 from the 2011 Soil Excavation Cleanup Action Report, the figure was unclear when depicting the excavation bottom. The narrative was also not clear as to the bottom depth across the excavation at specific locations. The reader is left with left to wonder if all the contaminated soil was excavated. Did the bottom vary in depth to coincide with the soil contamination? Some of the soil confirmation data points were questionable because of the widespread distance from (clean and dirty) sample locations, as providing supportable evidence that the contamination had been removed. Photos of the excavations would provide clarity to the how the excavation was completed.

3) All groundwater elevation data must be referenced using the NAVD88. The Table 2 footnote from the 2015 FFS/DCA indicates that the datum used was the NGVD29.

4) All analytical data collected after August 1, 2005 must be uploaded into Ecology's Environmental Information Management (EIM) System.

5) Ecology does not agree with your in the 2015 FFS/DCA assessment of the shallow groundwater as nonpotable. Please review the criteria set forth in WAC 173-340-720(2)(b)(i) when attempting to make a determination of whether Ecology views a groundwater as potable. Please apply all relevant criteria stated in WAC 173-360 when attempting to make this determination. Ecology has made no such determination.

6) When stamping a Report with a professional seal, please make sure the professional is currently licensed and up to date with the requirements of the Department of Licensing.

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

June 17, 2010

Mr. Branislav Jurista
Farallon Consulting
975 5th Avenue NW
Issaquah, WA 98027

Re: Opinion on Proposed Cleanup of the following Site:

- **Site Name:** Woodworth & Co. Lakeview Plant
- **Site Address:** 2800 104th Street South, Tacoma (Lakewood)
- **Facility/Site No.:** 1372
- **VCP Project No.:** SW1012

Dear Mr. Jurista:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of the Woodworth & Co. Lakeview Plant facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Upon completion of the proposed cleanup, will further remedial action likely be necessary to clean up contamination at the Site?

NO. Ecology has determined that, upon completion of your proposed cleanup, no further remedial action will likely be necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Petroleum hydrocarbons as diesel range organics (DRO) and oil range organics (ORO) into the Soil.

- DRO, trichloroethylene (TCE), arsenic, and lead into the Ground Water.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Saltbush Environmental Services, Inc., **Quarterly Ground Water Sampling Report, Lakeview Gravel Pit, 1st Quarter 1994 Report**, April 11, 1994.

2. Spectra Laboratories, **Quarterly Ground Water Monitoring Report, Lakeview Gravel Pit, Fourth Quarter 2005, Report**, January 12, 2006.

3. Tacoma-Pierce County Health Department, **Source Protection Programs/Site Hazard Assessment, Worksheet 1-Summary Score Sheet**, August 11, 2003.

4. Farallon Consulting, Inc., **Remedial Investigation Work Plan, Woodworth & Company, Inc., Lakeview Facility, 2800 104th Street South, Lakewood, Washington 98499**, January 26, 2009.

5. Farallon Consulting, Inc., **Addendum to Remedial Investigation Work Plan, Woodworth & Company, Inc., Lakeview Facility, 2800 104th Street South, Lakewood, Washington 98499**, January 30, 2009.

6. Farallon Consulting, Inc., **Remedial Investigation/Feasibility Study Report, Woodworth & Company, Inc., Lakeview Facility, 2800 104th Street South, Lakewood, Washington 98499, Toxics Cleanup Program VCP No. SW1012**, August 19, 2009.

7. Farallon Consulting, Inc., **Engineering Design Report, Woodworth Capital, Inc., Formerly Known as Woodworth & Company, Inc. Lakeview Facility, 2800 104th Street South, Lakewood, Washington 98499, Toxics Cleanup Program VCP No. SW1012**, January 20, 2010.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that, upon completion of your proposed cleanup, **no further remedial action** will likely be necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

The Site is defined as portions of the Property located at 2800 104th Street South in Lakewood, Washington that are known or have been found to contain contiguous concentrations of hazardous substances that exceed the applicable MTCA cleanup levels. The Site (as shown in Figure 2) has been apportioned into five Areas of Concern (AOC):

- AOC 1 – Equipment Storage Carport Area.
- AOC 2 – Equipment Parking Area.
- AOC 3 – Former Recycled Stockpile Area.
- AOC 4 – Asphalt-Testing Laboratory Area.
- AOC 5 – Atlas Foundry Waste Area.

AOC 1 is located on southern portion of the Property, and includes a carport structure that is used to store various equipment used for maintenance of the Woodworth truck fleet and operations of the asphalt plant. The results of the Remedial Investigation (RI) detected concentrations of DRO and ORO in shallow subsurface soil and ground water exceeding MTCA Method A cleanup levels.

AOC 2 is located directly north of the truck maintenance shop and is currently used by Woodworth for parking various trailer-mounted equipment and machinery. The results of the RI detected concentrations of ORO in soil exceeding the MTCA Method A cleanup level.

AOC 3 is located in the western portion of the Property in an area that formerly was used for stockpiling recycled asphaltic concrete, and currently is used for structural testing of asphalt. The results of the RI detected concentrations of DRO in shallow subsurface soils exceeding the MTCA Method A cleanup level.

AOC 4 is located near the central portion of the Property immediately west to northwest of the roofing shredder building in the reported vicinity of the former Washington State Department of Transportation (WSDOT) testing laboratory. Concentrations of TCE have been detected in ground water exceeding the MTCA Method A ground-water cleanup level.

AOC 5 is in the area of reported landfilling of Atlas Foundry waste material in the northeastern portion of the Property. The results of the RI detected concentrations of total and dissolved arsenic and lead in ground water exceeding MTCA Method A cleanup levels.

The Site has been defined through previous investigations conducted at the Property by others as described in the RI Work Plan and by the RI conducted by Farallon Consulting (Farallon). The investigations were conducted between 1983 and 2008 by Robinson and Noble, Inc., ATEC Associates, Inc., PAC-TECH Engineering, Inc., Saltbush Environmental Services, Inc., and Spectra Laboratories, Inc. The results of the investigations conducted at the Property have detected concentrations of TCE, DRO, metals, and ORO in ground water exceeding applicable MTCA cleanup levels.

Farallon conducted additional investigation at the Property between August and October 2008 that included advancement of soil borings, installation of monitoring wells, and collection and laboratory analysis of soil, ground-water, and surface-water samples.

The results of the previous investigations conducted by others, and the additional investigation activities conducted at the Property by Farallon were used to develop a preliminary conceptual Site model, and to identify gaps for the RI, conducted in 2009.

The RI included advancing eight soil borings for collection of soil samples and installation of eight additional monitoring wells (MW-9B, MW-10B, MW-11B, MW-12B, MW-14C, MW-17A, MW-18, and MW-19). The RI conducted ground-water monitoring and the collection of ground-water samples from 24 existing, and newly-installed monitoring wells, and one water-supply well. Ten test pits were excavated and soil samples were collected and analyzed.

The RI has provided sufficient data to refine the conceptual model, to identify the suspected sources of contamination, and evaluate the nature and extent of the constituents of potential concern (COPC), potential exposure pathways and receptors, and contaminant fate and transport characteristics. Enough data was gathered to select a cleanup action under WAC 173-340-360 through WAC 173-340-390.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site meet the substantive requirements of MTCA.

The contaminants of concern (COC) specific to the AOCs on the Property are defined by the results of the RI and previous investigations conducted on the Property. The COCs have been defined as the chemicals that have been detected at concentrations exceeding the cleanup levels defined in the RI.

The COCs exceeding the MTCA Method A cleanup levels that have been detected in soil include DRO and ORO. The Method A cleanup level is 2,000 milligrams per kilogram (mg/kg) for both total petroleum hydrocarbon diesel-range and oil-range constituent.

The COCs exceeding the MTCA cleanup levels in the ground water have been determined to be DRO, TCE, arsenic, and lead. In addition, a concentration of methylene chloride exceeded the Method A ground-water cleanup level in a sample collected from boring MW-9B. However, methylene chloride was flagged in the laboratory report as a common laboratory solvent and likely was introduced during sample preparation. The Method A cleanup level for DRO in ground water is 500 micrograms per liter (ug/l). The cleanup level was exceeded in a ground-water sample collected from the "shallow water-bearing zone" monitoring well MW-11.

Concentrations of TCE exceeding the MTCA Method A cleanup level of 5 ug/l were detected in the ground-water samples collected from "deep water-bearing zone" monitoring wells MW-2 and MW-14. Concentrations of TCE below the MTCA Method A cleanup level were detected in ground-water samples collected from monitoring wells screened in the "shallow water-bearing zone".

Concentrations of total and dissolved arsenic and total lead were detected exceeding the MTCA Method A cleanup levels (5 ug/l and 15 ug/l, respectively) in the ground-water sample collected from "shallow water-bearing zone" monitoring well MW-12.

The Remedial Investigation/Feasibility Study (RI/FS) has established that MTCA cleanup levels for total petroleum hydrocarbons (TPH) and volatile organic compounds (VOCs) established for the soil and ground water at the points of compliance, initially defined for soil as 'all soil on the Property"; and for ground water "throughout the Site from the top to the bottom of the saturated zone".

The point of compliance is the point or points where the soil cleanup levels established above shall be attained. For soil cleanup levels based on the protection of ground water, the point of compliance shall be established in the soils throughout the Site. The Site is defined by the soil concentrations that exceed the Method A soil cleanup levels identified in the soil samples from the excavations and boreholes constructed in the RI/FS activities.

For ground water, the point of compliance is the point or points where the ground-water cleanup levels established above must be attained for a Site to be in compliance with the cleanup standards. Ground-water cleanup levels shall be attained in all ground waters from

the point of compliance to the outer boundary of the hazardous substance plume. The standard point of compliance is established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest most depth that could potentially be affected by the Site. The extent of contamination has been established vertically to be present within the "deep water-bearing zone". The outer boundary of the hazardous substance plume, including metals, has been established by the monitoring well system just installed.

A simplified Terrestrial Ecological Evaluation was conducted. It was determined that the Site qualified for an exclusion. No further evaluation was conducted. In addition, the presence of DRO and ORO in soil, and TCE in ground water has the potential to result in vapor intrusion to indoor and outdoor air. However, concentrations of DRO and ORO are below the MTCA WAC 173-340-740 screening level of 10,000 mg/kg that would require the vapor pathway to be evaluated. TCE was determined to not pose an exposure risk because no buildings were present within 100 feet of the source area and the ground water concentrations that exceed MTCA Method A cleanup levels exist below 28 feet below ground surface (ft bgs). However, the intention of the RI/FS is to treat ground water until concentrations of TPH and VOCs are below MTCA Method A cleanup levels. The TCE Method A ground-water cleanup level is 5 ug/l. The ground-water Method C screening level for protection of indoor air is 4.2 ug/l. The cleanup of TCE in ground water will be protective of indoor air at the Site.

3. Selection of cleanup action.

Ecology has determined the cleanup action you proposed for the Site meets the substantive requirements of MTCA.

The technically feasible cleanup action alternatives evaluated for soil with concentrations of TPH above the MTCA cleanup levels at the Site in areas AOC 1, AOC 2, and AOC 3 (figure 2), included:

- Institutional controls and monitoring.
- In-situ treatment by soil vapor extraction (SVE).
- Removal by excavation and disposal by recycling.

The technically feasible cleanup action alternatives evaluated for ground water with concentrations of TPH or VOCs above the MTCA cleanup levels included:

- In-situ physical treatment by air sparging/soil vapor extraction (AS/SVE).
- In-situ chemical treatment.
- Ex-situ physical/chemical treatment (assuming ground water extraction).
- Enhanced anaerobic bioremediation of VOCs.

- Enhanced aerobic bioremediation of TPH.
- Monitored Natural Attenuation (MNA).

The action alternatives that were selected from this evaluation consist of a combination of technologies to remediate TPH in soil and TPH and VOCs in ground water. The selected cleanup actions include:

- TPH in soil: Removal by excavation and disposal or recycling of soil with concentrations of TPH above the MTCA Method A cleanup level.

- TPH in ground water: Source removal by soil excavation and enhanced aerobic bioremediation by the application of an enhancing agent (Oxygen Release Compound [ORC] or similar) in AOC 1 to backfill soils at the base of the excavation.

- VOCs in ground water: In-situ physical treatment by AS/SVE for ground water with concentrations of VOCs in ground water above the MTCA Method A cleanup levels.

In AOC 5, monitoring well MW-12 will be monitored and resampled using low-flow sampling methods to determine whether concentrations exceed MTCA Method A cleanup levels. If concentrations of total and dissolved lead and arsenic are below the MTCA Method A cleanup levels for four consecutive quarters, no cleanup action is necessary. If concentrations of total and dissolved lead or arsenic exceed the MTCA Method A cleanup levels in ground-water samples collected from monitoring well MW-12, another monitoring well will be constructed proximate to the location of MW-12. Ground-water use in this area may be restricted by an institutional control if analytical results confirm that cleanup levels are exceeded.

The cleanup action alternatives for ground water will require performance and compliance monitoring until the analytical results of ground-water sampling demonstrate that concentrations of TPH and/or VOCs are below MTCA Method A cleanup levels for four consecutive quarters.

The RI/FS states that the selected cleanup action will comply with cleanup standards by meeting MTCA cleanup levels for TPH in soil and TPH, VOCs, and metals in ground water at the points of compliance. Soil and ground water are defined as preliminary points of compliance throughout the Site in the RI. The final points of compliance for soil and ground water have been defined in the Engineering Design Report. The points of compliance and compliance monitoring for ground-water monitoring and sampling at the points of compliance will be performed during and after operation of the remediation system as described in the Engineering Design Report.

Limitations of the Opinion

1. **Opinion does not settle liability with the state.**

   Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

   - Resolve or alter a person's liability to the state.
   - Protect liable persons from contribution claims by third parties.

   To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. **Opinion does not constitute a determination of substantial equivalence.**

   To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you proposed will be substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. **Opinion is limited to proposed cleanup.**

   This letter does not provide an opinion on whether further remedial action will actually be necessary at the Site upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the VCP.

4. **State is immune from liability.**

   The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). As you conduct your cleanup, please do not hesitate to request additional services. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6267 or e-mail at CHCL461@ecy.wa.gov.

Sincerely,

Charles S. Cline
SWRO Toxics Cleanup Program

CSC/ksc:Woodworth Lakeview Facility Proposed Site Cleanup Likely NFA

Enclosures (1): A – Description and Diagrams of the Site

By certified mail: (7009 1410 0002 4420 4882)

cc: Mr. Jeff Woodworth, Woodworth Capital, Inc.
Ms. Sharon Bell, Tacoma-Pierce County Health Dept.
Mr. Scott Rose, Ecology
Ms. Dolores Mitchell, Ecology w/o enclosures

Enclosure A

Description and Diagrams of the Site

Site Description

The Site is located north of Washington State Route 512, east of Interstate 5, and west of Sales Road South in Section 6, Township 19 North, Range 3 East in Lakewood, Pierce County, Washington (Figures 1 and 2). The Site consists of Pierce County Parcel Nos. 0319061135, 0319061136, 0319062075, and 0319062076, together totaling approximately 60 acres. All four parcels are used by Woodworth Capital, Inc., formerly Woodworth & Company, Inc. (Woodworth) for the recycling of imported asphalt and concrete debris and for hot- and cold-mix asphalt production.

The southern 1/3 of the Site is almost entirely asphalt-paved and contains an asphalt-processing plant, a truck maintenance shop building, a covered carport used for equipment storage, a Quonset-shaped building used for the shredding and recycling of asphalt shingles, and several small sheds and trailer homes used for storage, office space, or warehouse. The southwestern portion of the Site is used for parking Woodworth fleet trucks. Employee parking areas and a storm-water collection retention pond with associated biofiltration swale are located at the western end of the Property. The southeastern end of the Site was occupied by a thermodesorption plant used for the treatment and recycling of petroleum-contaminated soil. An elevated gravel parking lot that is being leased to a neighboring business and used for parking is located along 104th Street South.

The central portion of the Site is used for asphalt and concrete recycling and for stockpiling raw and crushed material. Crushing equipment, radial stackers, and various stockpiles of sorted debris are located on this portion of the Site.

The northern 1/3 of the Site is used as a storage area for unused debris and material. A two-cell wet pond and associated infiltration trench are located at the far northern end of the Site. A water-supply well near the center portion of the Site provides water for steam-cleaning of equipment and roofing shingles. The water-supply well head is located in a well house.

The soil encountered at the Site during the field activities for the remedial investigation (RI) is consistent with previously observed and documented subsurface conditions. Poorly graded sands and gravels are the predominant lithology encountered at the Site and are separated into a shallow and a deep unit by a layer of silt and silty gravel. The shallow sand and gravel unit is primarily composed of poorly graded sands and gravels containing various amounts of silt from the ground surface to a depth of approximately 48 feet below ground surface (ft bgs). In some areas, the sand and gravel layer is replaced by fill material, which is largely reworked native material or imported material consisting of construction debris. Drilling and test pit explorations were used to identify and potentially delineate Atlas Foundry fill material. No evidence of foundry slag or metallic debris was found on the Site. Several discontinuous layers or lenses of silt and silty gravel have been encountered at depths ranging from 5 ft bgs in the southern portion of the Site to 30 ft bgs in the western portion of the Site. The silt and silty gravel layers appear to be a confining layer at the base of the Shallow Water-Bearing Zone, but are absent in the central portion of the Site.
The deep sand and gravel layer consists of fine to coarse sand and gravel with very little fines at depths ranging from approximately 20 ft bgs in the central portion to over 120 ft bgs in the southern and northwestern portions of the Site. The deep sand and gravel unit is underlain by a silt and silty gravel layer encountered at depths ranging from approximately 77 ft bgs to 127 ft bgs. This deep silt and silty gravel unit is considered to be the base of the Deep Water-Bearing Zone, and was encountered in borings MW-9B, MW-10B, MW-12, MW-14C, and the water-supply well located in

the central and western portions of the Site. This confining layer separates the Deep Water-Bearing Zone from a regional aquifer that provides water to the water-supply well located on the Site. The water supply well is used for industrial process water and is not used as a drinking water source.

The RI Work Plan described three water-bearing zones observed at the Site. However, the subsurface data collected during the RI indicate that Water-Bearing Zone 1 and Water-Bearing Zone 2 likely is a single water-bearing zone that contains discontinuous lenses of non water-bearing silt and silty gravel. This water-bearing zone is referred to at the Shallow Water-Bearing Zone.

Two ground-water bearing zones were identified during the RI. The Shallow Water-Bearing Zone ranges in thickness from 8 to 20 ft, appears to be discontinuous and largely unconfined, and was encountered at depths ranging from 5 to 36 ft bgs. A Deep Water-Bearing Zone encountered across the Site transitions from confined conditions in the east to unconfined conditions in the central portion of the Site and was encountered at depths ranging from 28 to 72 ft bgs. The Deep Water-Bearing Zone ranges in thickness from 46 to 60 ft. The Shallow Water Bearing Zone is separated from the Deep Water-Bearing Zone by a discontinuous layer of silt and silty gravel that is up to 30 ft thick in portions of the Site.

The static ground-water levels in the monitoring wells screened in the Shallow Water-Bearing Zone ranged from 5 to 36 ft below the top of the well casings during the field activities for the RI. The ground-water flow direction in the Shallow Water-Bearing Zone was observed to be generally to the north-northwest. The static ground-water levels in the monitoring wells screened in the Deep Water-Bearing Zone ranged from 17 to 69 ft below the top of the well casings during the field activities for the RI. The ground-water flow direction in the Deep Water-Bearing Zone was observed to be generally east-northeast, nearly opposite to the Shallow Water-Bearing Zone.

Site History

The Site was first developed between 1946 and 1969 for surface sand and gravel mining operations. Hot-mix asphalt production reportedly commenced on the Site in 1971. Sand and gravel mining operations continued until the late 1980s, at which time the raw materials for asphalt production were imported from off-Site locations.

Between the 1980s and early 1990s, the Washington State Department of Transportation (WSDOT) established a mobile laboratory on the Site for testing of asphalt mix, which included use of trichloroethylene (TCE) in the asphalt testing process. WSDOT may have disposed of spent TCE by pouring the substance directly into the soil on the Site. Although the exact location of the mobile laboratory is unknown, Farallon Consulting, Inc. (Farallon) learned through interviews that the likely location was the area between the asphalt plant and the roofing shredder building.

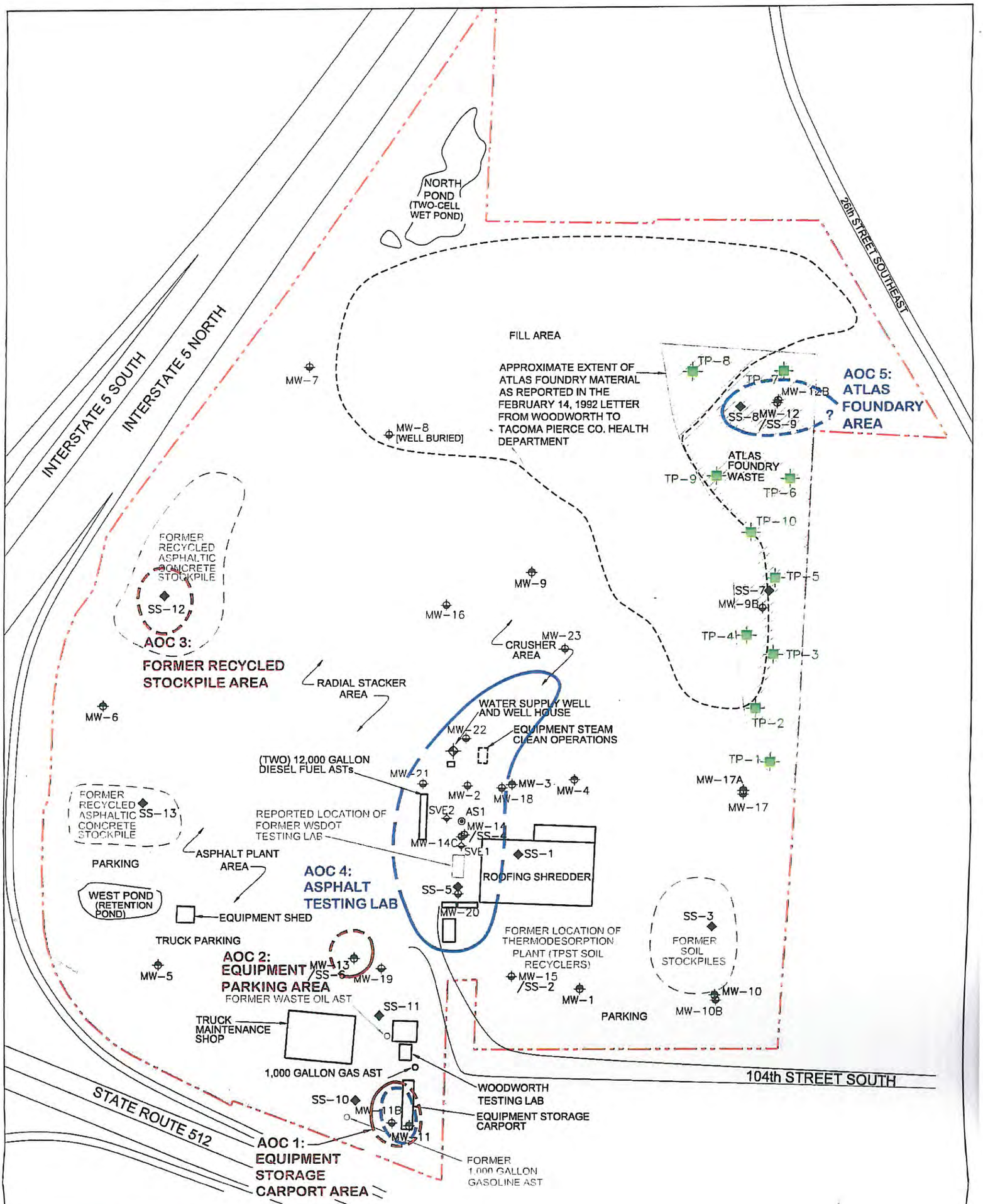
The Site was used from approximately 1981 to 1992 to landfill various inert waste materials, such as clean dirt and rock, waste concrete and asphalt, waste concrete roof tiles, and Atlas Foundry cast steel waste material consisting of refuse sand, refractory materials, reclaim dust, and slag. The Atlas Foundry waste material reportedly consisted of silica and chromite sands, bentonite clay, sodium silicate, burned dolomite brick, high alumina brick, calcium aluminate cement and mortar, ladle linings, and silica dust and flour.

Treatment of petroleum-contaminated soil was conducted on the Site from 1991 to 2005 under a Conditional Solid Waste Permit from Tacoma-Pierce County Health Department (TPCHD). In 1994, Woodworth sold the soil treatment facility to TPST Soil Recyclers of Washington (TPST), but remained an owner of the Site. Operations by TPST ended in approximately 2005, at which time the majority of the buildings and equipment used by TPST were demolished or decommissioned.

In August 2003, TPCHD conducted a Site Hazard Assessment (SHA) of the Woodworth facility. The Site's hazard ranking, an estimation of the potential threat to human health and the environment relative to all other Washington State sites assessed at the time, was determined to be a "2". The ranking scale ranges from 1 to 5, with 1 representing the highest relative risk and 5 the lowest relative risk. The relative risk ranking was based on the ground-water pathway. Lead, cadmium, chromium, TCE, diesel, and gasoline were considered for scoring. However, the ranking was driven by lead, TCE, and diesel.

Site Diagrams

Figure 1 – Woodworth Capital, Inc. Lakeview Plant,
Lakewood



LEGEND

- PROPERTY BOUNDARY
- FORMER STOCKPILE AREAS AND ABOVEGROUND STORAGE TANK (AST) LOCATIONS AS IDENTIFIED ON APEX ENGINEERING PLLC DRAWING (REF. 12795) IN THE AUGUST 11, 2003 TACOMA-PIERCE COUNTRY HEALTH DEPARTMENT SITE HAZARD ASSESSMENT REPORT.
- APPROXIMATE AREA OF GROUNDWATER CLEANUP ACTION
- APPROXIMATE AREA OF SOIL CLEANUP ACTION
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- SVE1 SOIL VAPOR EXTRACTION WELL
- AS1 AIR SPARGE WELL
- SS-10 SOIL SAMPLE
- TEST PIT
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE AND ASSEMBLED FROM 2008 AERIAL PHOTOGRAPH, UNLESS OTHERWISE NOTED. MONITORING WELL LOCATIONS WERE SURVEYED FOR HORIZONTAL AND VERTICAL COORDINATES BY A LICENSED SURVEYOR IN SEPTEMBER AND OCTOBER 2008, AND IN FEBRUARY 2009.

0 180
APPROXIMATE SCALE IN FEET

N

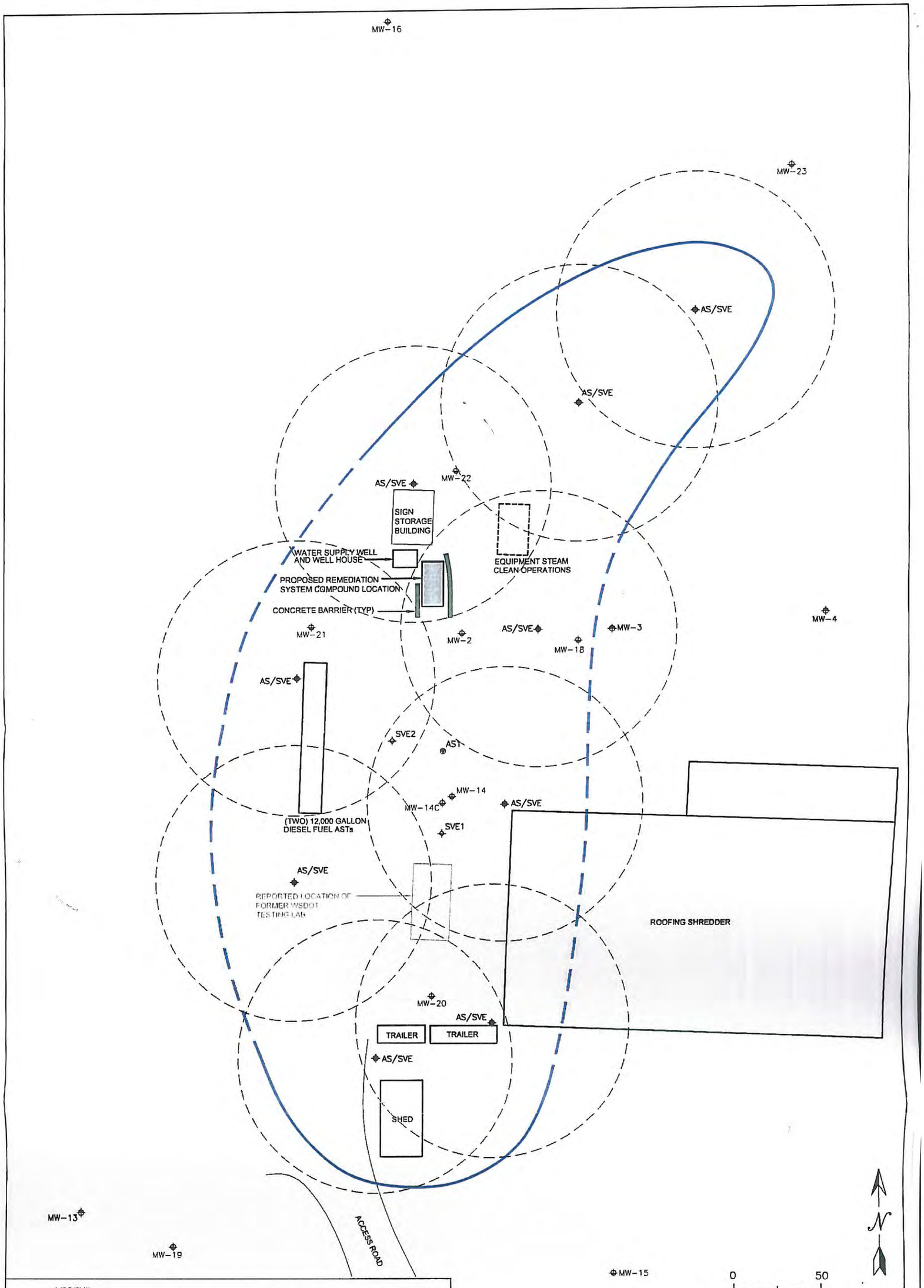
FIGURE 2

CLEANUP ACTION AREAS MAP
WOODWORTH LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FARALLON PN: 188-001

Drawn By: DEW	Checked By: BJ	Date: 1/06/10	Disk Reference: 188001



LEGEND

- MW-11 ⊕ MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 ⊕ MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- SVE1 ✧ SOIL VAPOR EXTRACTION WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- AS1 ⊛ AIR SPARGE SCREENED IN DEEP WATER-BEARING ZONE
- AS/SVE ◆ PROPOSED AIR SPARGE AND SOIL VAPOR EXTRACTION WELL
- APPROXIMATE AREA OF GROUNDWATER CLEANUP ACTION
- AREAS OF INFLUENCE
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

FIGURE 3

AS/SVE WELL LOCATIONS AND AREAS OF INFLUENCE
WOODWORTH LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-001

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

Drawn By: DEW	Checked By: BJ	Date: 1/06/10	Disk Reference: 188001

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

February 15, 2011

RECEIVED
FEB 18 2011
Farallon Consulting, L.L.C.

Mr. Branislav Jurista
Farallon Consulting
975 5th Avenue NW
Issaquah, WA 98027

Re: Opinion on Proposed Cleanup of the following Site:

- **Site Name:** Woodworth & Co. Lakeview Plant
- **Site Address:** 2800 104th Street South, Tacoma (Lakewood)
- **Facility/Site No.:** 1372
- **VCP Project No.:** SW1012

Dear Mr. Jurista:

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NO. Ecology has determined that, upon completion of your proposed cleanup, no further remedial action will likely be necessary to clean up contamination at the Site.

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- DRO, trichloroethylene (TCE), arsenic, and lead into the Ground Water.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

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8. Farallon Consulting, Inc., **Risk-Based Cleanup Level Calculation for Petroleum-Contaminated Soil, Woodworth Lakeview Facility, 2800 104th Street South, Lakewood, Washington, VCP Project No. SW1012**, December 1, 2010.

9. Ecology, "Opinion on Proposed Cleanup for the Woodworth & Co. Lakeview Plant, 2800 104th Street South, Tacoma (Lakewood), Facility/Site No. 1372, VCP Project No. SW1012", June 17, 2010.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that, upon completion of your proposed cleanup, **no further remedial action** will likely be necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

The Site is defined as portions of the Property located at 2800 104th Street South in Lakewood, Washington that are known or have been found to contain contiguous concentrations of hazardous substances that exceed the applicable MTCA cleanup levels. The Site (as shown in Figure 2) has been apportioned into five Areas of Concern (AOCs):

- AOC 1 – Equipment Storage Carport Area.
- AOC 2 – Equipment Parking Area.
- AOC 3 – Former Recycled Stockpile Area.
- AOC 4 – Asphalt-Testing Laboratory Area.
- AOC 5 – Atlas Foundry Waste Area.

AOC 1 is located on the southern portion of the Property, and includes a carport structure that is used to store various equipment used for maintenance of the Woodworth truck fleet and operations of the asphalt plant. The results of the Remedial Investigation (RI) detected concentrations of DRO and ORO in shallow subsurface soil and ground water exceeding MTCA Method A cleanup levels.

AOC 2 is located directly north of the truck maintenance shop and is currently used by Woodworth for parking various trailer-mounted equipment and machinery. The results of the RI detected concentrations of ORO in soil exceeding the MTCA Method A cleanup level.

AOC 3 is located in the western portion of the Property in an area that formerly was used for stockpiling recycled asphaltic concrete, and currently is used for structural testing of asphalt.

The results of the RI detected concentrations of DRO in shallow subsurface soils exceeding the MTCA Method A cleanup level.

AOC 4 is located near the central portion of the Property immediately west to northwest of the roofing shredder building in the reported vicinity of the former Washington State Department of Transportation (WSDOT) testing laboratory. Concentrations of TCE have been detected in ground water exceeding the MTCA Method A ground-water cleanup level.

AOC 5 is in the area of reported landfilling of Atlas Foundry waste material in the northeastern portion of the Property. The results of the RI detected concentrations of total and dissolved arsenic and lead in ground water exceeding MTCA Method A cleanup levels.

The Site has been defined through previous investigations conducted at the Property by others as described in the RI Work Plan and by the RI conducted by Farallon Consulting (Farallon). The investigations were conducted between 1983 and 2010 by Robinson and Noble, Inc., ATEC Associates, Inc., PAC-TECH Engineering, Inc., Saltbush Environmental Services, Inc., Spectra Laboratories, Inc., and Farallon. The results of the investigations conducted at the Property have detected concentrations of TCE, DRO, metals, and ORO in ground water exceeding applicable MTCA cleanup levels.

Farallon conducted investigation at the Property between August and October 2008 and October 2010 that included advancement of soil borings, installation of monitoring wells, and collection and laboratory analysis of soil, ground-water, and surface-water samples.

The results of the previous investigations conducted by others, and the additional investigation activities conducted at the Property by Farallon were used to develop a preliminary conceptual Site model, and to identify gaps for the RI, conducted in 2009.

The RI has provided sufficient data to refine the conceptual model, to identify the suspected sources of contamination, and evaluate the nature and extent of the constituents of potential concern (COPC), potential exposure pathways and receptors, and contaminant fate and transport characteristics. Enough data was gathered to select a cleanup action under WAC 173-340-360 through WAC 173-340-390.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site meet the substantive requirements of MTCA.

The contaminants of concern (COC) specific to the AOCs are defined by the results of the RI and previous investigations conducted on the Property. The COCs have been defined as the chemicals that have been detected at concentrations exceeding the cleanup levels defined in

the RI. The COCs for the Site include DRO and ORO in soil, and DRO, TCE, arsenic, and lead in ground water.

In June 2010, Ecology issued an opinion letter approving Farallon's proposal for cleanup at each of the five AOCs at the Site. That proposal had anticipated the use of MTCA Method A cleanup levels for all COCs. Since that time, Farallon collected additional soil samples from AOCs 2 and 3, and has proposed using Site-specific Method B cleanup levels for these AOCs.

A total of 16 soil samples were analyzed from AOC 2, and 65 soil samples were analyzed from AOC 3 for the Remedial Investigation/Feasibility Study (RI/FS) and recently for the excavation confirmation sampling (Figures 3 and 4). Tables 1 and 2 show the results for AOC 2 and AOC 3, respectively. The volume of soil with concentrations of ORO and DRO above the MTCA Method A cleanup levels is significantly greater than estimated in the Engineering Design Report (EDR) for AOCs 2 and 3 (Figure 2). Therefore, to minimize the volume of soil that will require removal and to provide a cost-effective cleanup action, Farallon evaluated whether a Site-specific MTCA Method B cleanup level for DRO and ORO in soil would be protective of human health and the environment. Farallon collected soil and ground-water samples for laboratory analysis in AOCs 2 and 3 where soil concentrations exceed the MTCA Method A cleanup levels. The soil samples were used to calculate MTCA Method B cleanup levels.

Based on the chemical composition of the petroleum hydrocarbon constituents present, the TPH concentration (sum of DRO and ORO) in soil protective of human health by direct contact and protection of the ground-water pathway was calculated to be:

- 3,699 mg/kg for AOC 2.
- 3,739 mg/kg for AOC 3.

Enclosure B shows the soil cleanup levels worksheets used for the AOCs.

Based on the chemical composition of the TPH, protection of ground water is not an issue since 100% non-aqueous phase liquid (NAPL) would be considered to be the limits on leaching to ground water. However, this is limited by residual saturation. The Method A cleanup level (2,000 mg/kg for either DRO or ORO) is based on a conservative estimate of residual saturation in coarse gravels. However, boring logs would indicate that the lithology present in the unsaturated zone is sandy gravel or silty sand with gravel. The residual saturation values (Table 3) that Ecology took from Mercer and Cohen (1990) to develop the Method A cleanup levels for middle distillates (DRO) would indicate that equivalent values for coarse sand and gravel is 3,879 mg/kg and for medium to coarse sand is greater than 7,000 mg/kg. The empirical data from the ground-water sampling would indicate that the concentrations of TPH present in the soil are protective of the ground water.

The point of compliance is the point or points where the soil cleanup levels established above shall be attained. For soil cleanup levels based on the protection of ground water, the point of compliance shall be established in the soils throughout the Site. The Site is defined by the soil concentrations that exceed the Method A soil cleanup levels identified in the soil samples from the excavations and boreholes constructed in the RI/FS activities.

A simplified Terrestrial Ecological Evaluation was conducted. It was determined that the Site qualified for an exclusion. No further evaluation was conducted. In addition, the presence of DRO and ORO in soil and TCE in ground water has the potential to result in vapor intrusion to indoor and outdoor air. However, concentrations of DRO and ORO in AOCs 2 and 3 will be below the MTCA WAC 173-340-740 screening level of 10,000 mg/kg that would require the vapor pathway to be evaluated.

3. Selection of cleanup action.

Ecology has determined the cleanup action you proposed for the Site meets the substantive requirements of MTCA.

The action alternatives that were selected for cleanup consist of a combination of technologies to remediate TPH in soil and TPH and VOCs in ground water. The selected cleanup actions include:

- TPH in soil: Removal by excavation and disposal or recycling of soil with concentrations of TPH above the MTCA Method A cleanup level.

- TPH in ground water: Source removal by soil excavation and enhanced aerobic bioremediation by the application of an enhancing agent (Oxygen Release Compound [ORC] or similar) in AOC 1 to backfill soils at the base of the excavation.

- VOCs in ground water: In-situ physical treatment by AS/SVE for ground water with concentrations of VOCs in ground water above the MTCA Method A cleanup levels.

The original Ecology-approved (June 17, 2010) scope of work for AOCs 2 and 3 was excavation and on-Site recycling or off-Site disposal of soil with concentrations of DRO and/or ORO exceeding the MTCA Method A cleanup levels. Soil with concentrations of DRO or ORO above the MTCA Method A cleanup levels has been excavated from AOC 1. Excavation of soil is being conducted currently at AOCs 2 and 3. It is currently proposed that soil with concentrations of TPH (sum of DRO and ORO) greater than 3,699 mg/kg will be excavated from AOC 2. Soil with concentrations of TPH (sum of DRO and ORO) above 3,739 mg/kg will be excavated from AOC 3.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you proposed will be substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. Opinion is limited to proposed cleanup.

This letter does not provide an opinion on whether further remedial action will actually be necessary at the Site upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the VCP.

4. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). As you conduct your cleanup, please do not hesitate to request additional services. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6267 or e-mail at CHCL461@ecy.wa.gov.

Sincerely,

Charles S. Cline
SWRO Toxics Cleanup Program

CSC/ksc:Woodworth Lakeview Facility Proposed Site cleanup likely NFA

Enclosures (1): A – Description and Diagrams of the Site
B – Soil Cleanup Level Worksheets

By certified mail: (7009 2820 0001 7155 3244)

cc: Mr. Jeff Woodworth, Woodworth Capital, Inc.
Ms. Sharon Bell, Tacoma-Pierce County Health Dept.
Mr. Scott Rose, Ecology
Ms. Dolores Mitchell, Ecology w/o enclosures

Enclosure A

Description and Diagrams of the Site

Site Description

The Site is located north of Washington State Route 512, east of Interstate 5, and west of Sales Road South in Section 6, Township 19 North, Range 3 East in Lakewood, Pierce County, Washington (Figure 1). The Site consists of Pierce County Parcel Nos. 0319061135, 0319061136, 0319062075, and 0319062076, together totaling approximately 60 acres. All four parcels are used by Woodworth Capital, Inc., formerly Woodworth & Company, Inc. (Woodworth) for the recycling of imported asphalt and concrete debris and for hot- and cold-mix asphalt production.

The southern 1/3 of the Site is almost entirely asphalt-paved and contains an asphalt-processing plant, a truck maintenance shop building, a covered carport used for equipment storage, a Quonset-shaped building used for the shredding and recycling of asphalt shingles, and several small sheds and trailer homes used for storage, office space, or warehouse. The southwestern portion of the Site is used for parking Woodworth fleet trucks. Employee parking areas and a storm-water collection retention pond with associated biofiltration swale are located at the western end of the Property. The southeastern end of the Site was occupied by a thermodesorption plant used for the treatment and recycling of petroleum-contaminated soil. An elevated gravel parking lot that is being leased to a neighboring business and used for parking is located along 104th Street South.

The central portion of the Site is used for asphalt and concrete recycling and for stockpiling raw and crushed material. Crushing equipment, radial stackers, and various stockpiles of sorted debris are located on this portion of the Site.

The northern 1/3 of the Site is used as a storage area for unused debris and material. A two-cell wet pond and associated infiltration trench are located at the far northern end of the Site. A water-supply well near the center portion of the Site provides water for steam-cleaning of equipment and roofing shingles. The water-supply well head is located in a well house.

The soil encountered at the Site during the field activities for the remedial investigation (RI) is consistent with previously observed and documented subsurface conditions. Poorly graded sands and gravels are the predominant lithology encountered at the Site and are separated into a shallow and a deep unit by a layer of silt and silty gravel. The shallow sand and gravel unit is primarily composed of poorly graded sands and gravels containing various amounts of silt from the ground surface to a depth of approximately 48 feet below ground surface (ft bgs). In some areas, the sand and gravel layer is replaced by fill material, which is largely reworked native material or imported material consisting of construction debris. Drilling and test pit explorations were used to identify and potentially delineate Atlas Foundry fill material. No evidence of foundry slag or metallic debris was found on the Site. Several discontinuous layers or lenses of silt and silty gravel have been encountered at depths ranging from 5 ft bgs in the southern portion of the Site to 30 ft bgs in the western portion of the Site. The silt and silty gravel layers appear to be a confining layer at the base of the Shallow Water-Bearing Zone, but are absent in the central portion of the Site.

The deep sand and gravel layer consists of fine to coarse sand and gravel with very little fines at depths ranging from approximately 20 ft bgs in the central portion to over 120 ft bgs in the southern and northwestern portions of the Site. The deep sand and gravel unit is underlain by a silt and silty gravel layer encountered at depths ranging from approximately 77 ft bgs to 127 ft bgs. This deep silt and silty gravel unit is considered to be the base of the Deep Water-Bearing Zone, and was encountered in borings MW-9B, MW-10B, MW-12, MW-14C, and the water-supply well located in the central and western portions of the Site. This confining layer separates the Deep Water-Bearing Zone from a regional aquifer that provides water to the water-supply well located on the Site. The water supply well is used for industrial process water and is not used as a drinking water source.

The RI Work Plan described three water-bearing zones observed at the Site. However, the subsurface data collected during the RI indicate that Water-Bearing Zone 1 and Water-Bearing Zone 2 likely is a single water-bearing zone that contains discontinuous lenses of non water-bearing silt and silty gravel. This water-bearing zone is referred to at the Shallow Water-Bearing Zone.

Two ground-water bearing zones were identified during the RI. The Shallow Water-Bearing Zone ranges in thickness from 8 to 20 ft, appears to be discontinuous and largely unconfined, and was encountered at depths ranging from 5 to 36 ft bgs. A Deep Water-Bearing Zone encountered across the Site transitions from confined conditions in the east to unconfined conditions in the central portion of the Site and was encountered at depths ranging from 28 to 72 ft bgs. The Deep Water-Bearing Zone ranges in thickness from 46 to 60 ft. The Shallow Water Bearing Zone is separated from the Deep Water-Bearing Zone by a discontinuous layer of silt and silty gravel that is up to 30 ft thick in portions of the Site.

The static ground-water levels in the monitoring wells screened in the Shallow Water-Bearing Zone ranged from 5 to 36 ft below the top of the well casings during the field activities for the RI. The ground-water flow direction in the Shallow Water-Bearing Zone was observed to be generally to the north-northwest. The static ground-water levels in the monitoring wells screened in the Deep Water-Bearing Zone ranged from 17 to 69 ft below the top of the well casings during the field activities for the RI. The ground-water flow direction in the Deep Water-Bearing Zone was observed to be generally east-northeast, nearly opposite to the Shallow Water-Bearing Zone.

Site History

The Site was first developed between 1946 and 1969 for surface sand and gravel mining operations. Reportedly, hot-mix asphalt production commenced on the Site in 1971. Sand and gravel mining operations continued until the late 1980s, at which time the raw materials for asphalt production were imported from off-Site locations.

Between the 1980s and early 1990s, the Washington State Department of Transportation (WSDOT) established a mobile laboratory on the Site for testing of asphalt mix, which included use of trichloroethylene (TCE) in the asphalt testing process. WSDOT may have disposed of spent TCE by pouring the substance directly into the soil on the Site. Although the exact location of the mobile laboratory is unknown, Farallon Consulting, Inc. (Farallon) learned through interviews that the likely location was the area between the asphalt plant and the roofing shredder building.

The Site was used from approximately 1981 to 1992 to landfill various inert waste materials, such as clean dirt and rock, waste concrete and asphalt, waste concrete roof tiles, and Atlas Foundry cast steel waste material consisting of refuse sand, refractory materials, reclaim dust, and slag. The Atlas Foundry waste material reportedly consisted of silica and chromite sands, bentonite clay, sodium silicate, burned dolomite brick, high alumina brick, calcium aluminate cement and mortar, ladle linings, and silica dust and flour.

Treatment of petroleum-contaminated soil was conducted on the Site from 1991 to 2005 under a Conditional Solid Waste Permit from Tacoma-Pierce County Health Department (TPCHD). In 1994, Woodworth sold the soil treatment facility to TPST Soil Recyclers of Washington (TPST), but remained an owner of the Site. Operations by TPST ended in approximately 2005, at which time the majority of the buildings and equipment used by TPST were demolished or decommissioned.

In August 2003, TPCHD conducted a Site Hazard Assessment (SHA) of the Woodworth facility. The Site's hazard ranking, an estimation of the potential threat to human health and the environment relative to all other Washington State sites assessed at the time, was determined to be a "2". The ranking scale ranges from 1 to 5, with 1 representing the highest relative risk and 5 the lowest relative risk. The relative risk ranking was based on the ground-water pathway. Lead, cadmium, chromium, TCE, diesel, and gasoline were considered for scoring. However, the ranking was driven by lead, TCE, and diesel.

ENCLOSURE B

Soil Cleanup Levels Worksheets

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/20/10
Site Name: Woodworth Lakevew Facility
Sample Name: A2-B1-P-100510-2.0

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	2.5	0.09%
AL_EC >10-12	7	0.24%
AL_EC >12-16	470	16.02%
AL_EC >16-21	950	32.37%
AL_EC >21-34	560	19.08%
AR_EC >8-10	2.422	0.08%
AR_EC >10-12	2.49645	0.09%
AR_EC >12-16	49.939	1.70%
AR_EC >16-21	490	16.70%
AR_EC >21-34	399.91405	13.63%
Benzene	0.01	0.00%
Toluene	0.026	0.00%
Ethylbenzene	0.026	0.00%
Total Xylenes	0.052	0.00%
Naphthalene	0.00355	0.00%
1-Methyl Naphthalene	0.043	0.00%
2-Methyl Naphthalene	0.018	0.00%
n-Hexane		0.00%
MTBE		0.00%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene	0.0088	0.00%
Benzo(b)fluoranthene	0.0095	0.00%
Benzo(k)fluoranthene	0.00355	0.00%
Benzo(a)pyrene	0.009	0.00%
Chrysene	0.048	0.00%
Dibenz(a,h)anthracene	0.00355	0.00%
Indeno(1,2,3-cd)pyrene	0.00355	0.00%
Sum	2934.536	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here:	500	ug/L

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/20/2010
Site Name: Woodworth Lakevew Facility
Sample Name: A2-B1-P-100510-2.0
Measured Soil TPH Concentration, mg/kg: **2,934.536**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	3,699	1.20E-07	7.94E-01	Pass
	Method C	44,489	2.97E-08	6.60E-02	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protection	100% NAPL	7.74E-07	6.11E-02	Pass
	Target TPH GW Conc. @ 500 ug/L	100% NAPL	NA	NA	Pass

Warning! Check to determine if a simplified or site-specific Terrestrial Ecological Evaluation may be required (Refer to WAC 173-340-7490 through -7494).

Warning! Check Residual Saturation (WAC340-747(10)).

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**3,698.88**	**44,488.68**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	3.70E+03	1.51E-07	1.00E+00	YES	4.45E+04	4.50E-07	1.00E+00
Total Risk=1E-5	*NO*	2.45E+05	1.00E-05	6.62E+01	*NO*	9.88E+05	1.00E-05	2.22E+01
Risk of Benzene= 1E-6	*NO*	5.33E+06	2.18E-04	1.44E+03	NA			
Risk of cPAHs mixture= 1E-6	*NO*	2.46E+04	1.00E-06	6.65E+00				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**NA**
Protective Ground Water Concentration, ug/L	**NA**
Protective Soil Concentration, mg/kg	**Soil-to-Ground Water is not a critical pathway!**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	YES	2.33E+01	1.16E-06	7.19E-02	100% NAPL
Total Risk = 1E-5	YES	2.33E+01	1.16E-06	7.19E-02	100% NAPL
Total Risk = 1E-6	YES	2.29E+01	1.00E-06	6.75E-02	8.51E+03
Risk of cPAHs mixture= 1E-5	YES	2.33E+01	1.16E-06	7.19E-02	100% NAPL
Benzene MCL = 5 ug/L	YES	2.33E+01	1.16E-06	7.19E-02	100% NAPL
MTBE = 20 ug/L	NA	NA	NA	NA	NA

Note: 100% NAPL is 76000 mg/kg TPH.

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 500 ug/L	2.33E+01	1.16E-06	7.19E-02	**100% NAPL**

A1 Soil Cleanup Levels: Worksheet for Soil Data Entry: Refer to WAC 173-340-720, 740,745, 747, 750

1. Enter Site Information

Date: 10/18/10
Site Name: Woodworth Lakevew Facility
Sample Name: A3-B2-P-100510-4.5

2. Enter Soil Concentration Measured

Chemical of Concern or Equivalent Carbon Group	Measured Soil Conc dry basis mg/kg	Composition Ratio %
Petroleum EC Fraction		
AL_EC >5-6		0.00%
AL_EC >6-8		0.00%
AL_EC >8-10	38	0.35%
AL_EC >10-12	280	2.61%
AL_EC >12-16	2100	19.57%
AL_EC >16-21	2500	23.29%
AL_EC >21-34	3100	28.88%
AR_EC >8-10	7.873	0.07%
AR_EC >10-12	56.12	0.52%
AR_EC >12-16	562.7	5.24%
AR_EC >16-21	1400	13.04%
AR_EC >21-34	669.747	6.24%
Benzene	0.01	0.00%
Toluene	0.035	0.00%
Ethylbenzene	0.035	0.00%
Total Xylenes	0.092	0.00%
Naphthalene	0.88	0.01%
1-Methyl Naphthalene	7.6	0.07%
2-Methyl Naphthalene	9.7	0.09%
n-Hexane		0.00%
MTBE		0.00%
Ethylene Dibromide (EDB)		0.00%
1,2 Dichloroethane (EDC)		0.00%
Benzo(a)anthracene	0.0205	0.00%
Benzo(b)fluoranthene	0.0205	0.00%
Benzo(k)fluoranthene	0.0205	0.00%
Benzo(a)pyrene	0.0205	0.00%
Chrysene	0.13	0.00%
Dibenz(a,h)anthracene	0.0205	0.00%
Indeno(1,2,3-cd)pyrene	0.0205	0.00%
Sum	10733.045	100.00%

Notes for Data Entry | Set Default Hydrogeology

Clear All Soil Concentration Data Entry Cells

Restore All Soil Concentration Data cleared previously

REMARK:
Enter site-specific information here.....

3. Enter Site-Specific Hydrogeological Data

Total soil porosity:	0.43	Unitless
Volumetric water content:	0.3	Unitless
Volumetric air content:	0.13	Unitless
Soil bulk density measured:	1.5	kg/L
Fraction Organic Carbon:	0.001	Unitless
Dilution Factor:	20	Unitless

4. Target TPH Ground Water Concentation (if adjusted)

If you adjusted the target TPH ground water concentration, enter adjusted value here:	500	ug/L

A2 Soil Cleanup Levels: Calculation and Summary of Results. Refer to WAC 173-340-720, 740, 745, 747, 750

Site Information

Date: 10/18/2010
Site Name: Woodworth Lakevew Facility
Sample Name: A3-B2-P-100510-4.5
Measured Soil TPH Concentration, mg/kg: **10,733.045**

1. Summary of Calculation Results

Exposure Pathway	Method/Goal	Protective Soil TPH Conc, mg/kg	With Measured Soil Conc		Does Measured Soil Conc Pass or Fail?
			RISK @	HI @	
Protection of Soil Direct Contact: Human Health	Method B	3,739	3.10E-07	2.87E+00	Fail
	Method C	46,269	7.68E-08	2.32E-01	Pass
Protection of Method B Ground Water Quality (Leaching)	Potable GW: Human Health Protectior	100% NAPL	2.80E-07	1.94E-01	Pass
	Target TPH GW Conc. @ 500 ug/L	100% NAPL	NA	NA	Pass

Warning! Check to determine if a simplified or site-specific Terrestrial Ecological Evaluation may be required (Refer to WAC 173-340-7490 through ~7494).

Warning! Check Residual Saturation (WAC340-747(10)).

2. Results for Protection of Soil Direct Contact Pathway: Human Health

	Method B: Unrestricted Land Use	Method C: Industrial Land Use
Protective Soil Concentration, TPH mg/kg	**3,738.83**	**46,268.50**
Most Stringent Criterion	**HI =1**	**HI =1**

Soil Criteria	Protective Soil Concentration @Method B				Protective Soil Concentration @Method C			
	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @	Most Stringent?	TPH Conc, mg/kg	RISK @	HI @
HI =1	YES	3.74E+03	1.08E-07	1.00E+00	YES	4.63E+04	3.31E-07	1.00E+00
Total Risk=1E-5	*NO*	3.47E+05	1.00E-05	9.27E+01	*NO*	1.40E+06	1.00E-05	3.02E+01
Risk of Benzene= 1E-6	*NO*	1.95E+07	5.62E-04	5.21E+03	NA			
Risk of cPAHs mixture= 1E-6	*NO*	3.47E+04	1.00E-06	9.29E+00				
EDB	NA	NA	NA	NA				
EDC	NA	NA	NA	NA				

3. Results for Protection of Ground Water Quality (Leaching Pathway)

3.1. Protection of Potable Ground Water Quality (Method B): Human Health Protection

Most Stringent Criterion	**NA**
Protective Ground Water Concentration, ug/L	**NA**
Protective Soil Concentration, mg/kg	**Soil-to-Ground Water is not a critical pathway!**

Ground Water Criteria	Protective Potable Ground Water Concentration @Method B				Protective Soil Conc, mg/kg
	Most Stringent?	TPH Conc, ug/L	RISK @	HI @	
HI=1	YES	5.06E+01	3.13E-07	1.96E-01	100% NAPL
Total Risk = 1E-5	YES	5.06E+01	3.13E-07	1.96E-01	100% NAPL
Total Risk = 1E-6	YES	5.06E+01	3.13E-07	1.96E-01	100% NAPL
Risk of cPAHs mixture= 1E-5	YES	5.06E+01	3.13E-07	1.96E-01	100% NAPL
Benzene MCL = 5 ug/L	YES	5.06E+01	3.13E-07	1.96E-01	100% NAPL
MTBE = 20 ug/L	NA	NA	NA	NA	NA

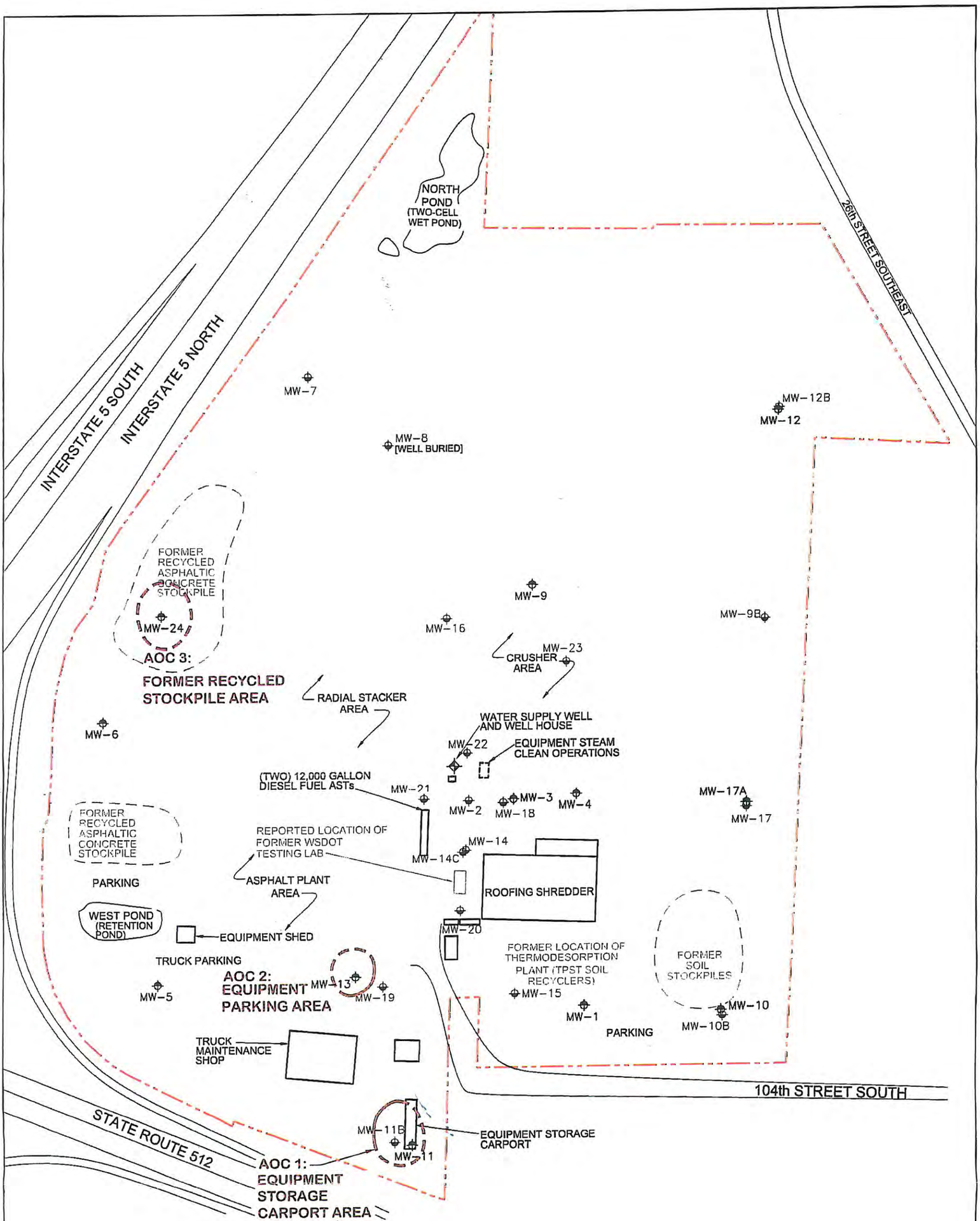
Note: 100% NAPL is 73000 mg/kg TPH.

3.2 Protection of Ground Water Quality for TPH Ground Water Concentration previously adjusted and entered

Ground Water Criteria	Protective Ground Water Concentration			Protective Soil Conc, mg/kg
	TPH Conc, ug/L	Risk @	HI @	
Target TPH GW Conc = 500 ug/L	5.06E+01	3.13E-07	1.96E-01	**100% NAPL**

Site Diagrams

Figure 1 – Woodworth Capital, Inc. Lakeview Plant,
Lakewood



LEGEND

- PROPERTY BOUNDARY
- FORMER STOCKPILE AREAS AND ABOVEGROUND STORAGE TANK (AST) LOCATIONS AS IDENTIFIED ON APEX ENGINEERING PLLC DRAWING (REF. 12795) IN THE AUGUST 11, 2003 TACOMA-PIERCE COUNTRY HEALTH DEPARTMENT SITE HAZARD ASSESSMENT REPORT.
- APPROXIMATE AREA OF SOIL CLEANUP ACTION
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- AOC AREA OF CONCERN
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

FIGURE 2

CLEANUP ACTION AREAS FOR PETROLEUM HYDROCARBONS
WOODWORTH LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW	Checked By: BJ	Date: 10/27/10	Disk Reference: 188002S

SCALE HOUSE

SCALE PLATFORM

FLAG POLE

LANDSCAPING

A

B

C

0

1

2

~ASPHALT DRIVE~

ECOLOGY BLOCKS

LANDSCAPING

~ASPHALT~

~ASPHALT~

A2-2-040710-1.5

A2-A0-SW-110410-1.5

A2-1-040710-4

SB6-2.5-100708

A2-B0-SW-110310-1.5

MW-13

A2-A1-BTM-110310-2.5

A2-B1-BTM-110310-2.0

A2-1-040710-3

A2-7-040810-1.5

A2-A2-SW-110410-4.0

MW-19

A2-A1-P-100510-1.5

A2-B1-P-100510-2.0

A2-C1-SW-110310-1.5

A2-B1-SW-110310-1.5

A2-A2-BTM-110310-4.0

A2-8-040810-2

FACILITY ACCESS DRIVE (ASPHALT)

TRUCK MAINTENANCE SHOP

10,000-GALLON ABOVE GROUND TAR TANK IN CONCRETE CONTAINMENT

BUILDING

WOOD FRAME BUILDING

LEGEND

A / 1 — SAMPLING GRID

A2-1-040710-4 — CONFIRMATION SOIL SAMPLE LOCATION

A2-7-040810-1.5 — SOIL SAMPLE WHERE CONCENTRATION OF TOTAL PETROLEUM HYDROCARBONS EXCEEDS CALCULATED CLEANUP LEVEL

MW-13 — MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE

MW-19 — MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE

AOC — AREA OF CONCERN

ALL LOCATIONS ARE APPROXIMATE

N

0 30

Scale in feet

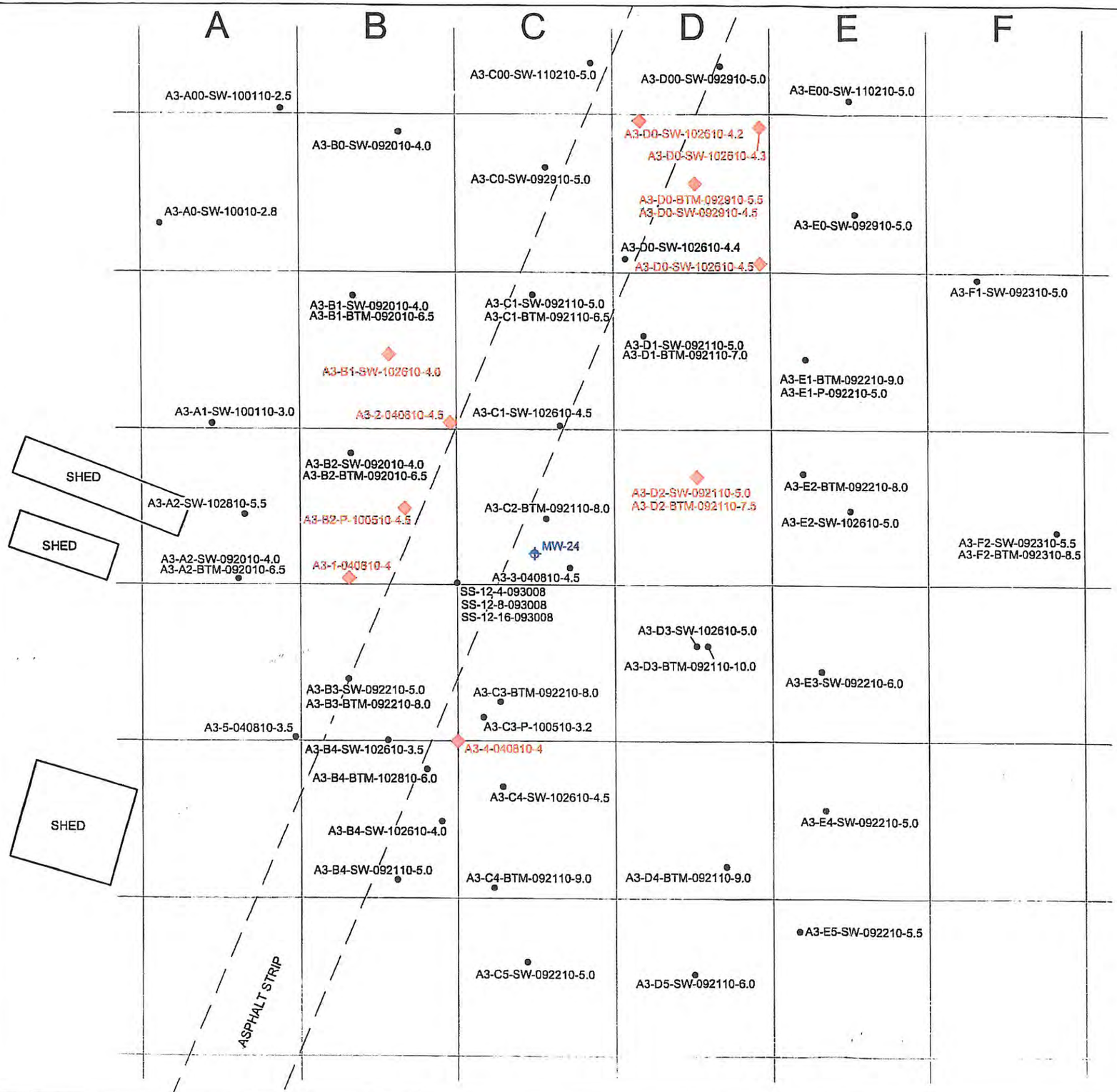
FIGURE 3

AOC 2 SOIL SAMPLE LOCATIONS
WOODWORTH LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

Drawn By: DEW	Checked By: BC	Date: 11/11/10	Disk Reference: 188002



LEGEND

A / 1 — SAMPLING GRID

A3-F2-SW-092310-5.5 — CONFIRMATION SOIL SAMPLE LOCATION

A3-2-040810-4.5 — SOIL SAMPLE WHERE CONCENTRATION OF TOTAL PETROLEUM HYDROCARBONS EXCEEDS CALCULATED CLEANUP LEVEL

MW-24 — MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE

AOC — AREA OF CONCERN

ALL LOCATIONS ARE APPROXIMATE

N

0 20

Scale in feet

FIGURE 4

AOC 3 SOIL SAMPLE LOCATIONS
WOODWORTH LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

FARALLON CONSULTING
975 5th Avenue Northwest
Issaquah, WA 98027

Drawn By:	Checked By:	Date:	Disk Reference:
DEW	BC	11/11/10	188002

Table 1
Soil Analytical Results for Petroleum Hydrocarbons and BTEX in AOC 2
Woodworth Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Sample Identification	Cell Identification	Sample Date	Depth (feet bgs)[1]	Analytical Results (milligrams per kilogram)							
				GRO[2]	DRO[3]	ORO[3]	Total Petroleum Hydrocarbons[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]
Area of Concern 2											
A2-A0-SW-110410-1.5	A-0	11/4/2010	1.5	—	150	570	720	—	—	—	—
SS6-2.5-100708	A-1	10/7/2008	2.5	<5.3	<880	**4,000**	**4,000**	<0.020	<0.053	<0.053	<0.106
A2-1-040710-4	A-1	4/7/2010	4.0	—	160	870	1,030	—	—	—	—
A2-2-040710-1.5	A-1	4/7/2010	1.5	—	470	1,600	2,070	—	—	—	—
A2-4-040710-3	A-1	4/7/2010	3.0	—	<1,300	**15,000**	**15,000**	—	—	—	—
A2-A1-P-100510-1.5	A-1	10/5/2010	1.5	—	<320	**3,900**	**3,900**	—	—	—	—
A2-A1-BTM-110310-2.5	A-1	11/3/2010	2.5	—	100	760	860	—	—	—	—
A2-8-040810-2	A-2	4/8/2010	2.0	—	<32	320	320	—	—	—	—
A2-A2-SW-110410-4.0	A-2	11/4/2010	4.0	—	110	600	710	—	—	—	—
A2-A2-BTM-110310-4.0	A-2	11/3/2010	4.0	—	<48	480	480	—	—	—	—
A2-B0-SW-110310-1.5	B-0	11/3/2010	1.5	—	120	630	750	—	—	—	—
A2-7-040810-1.5	B-1	4/8/2010	1.5	—	520	**4,200**	**4,720**	—	—	—	—
A2-B1-SW-110310-1.5	B-1	11/3/2010	1.5	—	<110	800	800	—	—	—	—
A2-B1-BTM-110310-2.0	B-1	11/3/2010	2.0	—	110	400	510	—	—	—	—
A2-B1-P-100510-2.0	B-2	10/5/2010	2.0	—	1,600	1,100	2,700	<0.020	<0.052	<0.052	<0.104
A2-C1-SW-110310-1.5	C-1	11/3/2010	1.5	—	180	820	1,000	—	—	—	—
MTCA Method A Cleanup Levels[6]				**100[7]**	**2,000**	**2,000**	NC	**0.03**	**7**	**6**	**9**
Calculated Method B Cleanup Levels[8]				NC	NC	NC	**3,699**	NC	NC	NC	NC

NOTES:

Results in **bold** denote concentrations exceed Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil cleanup levels (see footnote 6).

Results in cells with a heavy-line border denote concentrations exceed calculated Method B Soil cleanup levels (see footnote 7).

< denotes analyte not detected at or above the reporting limit listed.

— = denotes sample not analyzed

[1] Depth in feet below ground surface (bgs).

[2] Analyzed by Northwest Method NWTPH-Gx.

[3] Analyzed by Northwest Method NWTPH-Dx.

[4] Sum of GRO, DRO, and ORO concentrations

[5] Analyzed by U.S. Environmental Protection Agency (EPA) Method 8260B.

[6] MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised November 2007.

[7] The cleanup level for GRO is without the presence of benzene.

[8] Method B Soil Cleanup Level for Unrestricted Land Uses, as calculated using *Workbook Tools for Calculating Soil and Ground Water Cleanup Levels under the MTCA, Revised December 2007.*

AOC = area of concern

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

GRO = TPH as gasoline-range organics

ORO = TPH as oil-range organics

NC= not calculated

Table

Soil Analytical Results for Petroleum Hydrocarbons and BTEX in AOC 3
Woodworth Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Sample Identification	Cell Identification	Sample Date	Depth (feet bgs)[1]	Analytical Results (milligrams per kilogram)							
				GRO[3]	DRO[3]	ORO[3]	Total Petroleum Hydrocarbons[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]
Area of Concern 3											
A3-A00-SW-100110-2.5	A-00	10/1/2010	2.5	—	140	1,000	1,140	—	—	—	—
A3-A0-SW-100110-2.8	A-0	10/1/2010	2.8	—	310	660	970	—	—	—	—
A3-A1-SW-100110-3.0	A-1	10/1/2010	3.0	—	830	**2,300**	3,130	—	—	—	—
A3-A2-SW-092010-4.0	A-2	9/20/2010	4.0	—	390	240	630	—	—	—	—
A3-A2-SW-102810-5.5	A-2	10/28/2010	5.5	—	**3,000**	96	3,096	—	—	—	—
A3-A2-BTM-092010-6.5	A-2	9/20/2010	6.5	—	<29	<58	<87	—	—	—	—
A3-5-040810-3.5	A-3	4/8/2010	3.5	—	190	290	480	—	—	—	—
A3-B0-SW-092010-4.0	B-0	9/20/2010	4.0	—	<27	<54	<81	—	—	—	—
A3-2-040810-4.5	B-1	4/8/2010	4.5	—	770	**4,700**	**5,470**	—	—	—	—
A3-B1-SW-092010-4.0	B-1	9/20/2010	4.0	—	550	**2,100**	2,650	—	—	—	—
A3-B1-SW-102610-4.0	B-1	10/26/2010	4.0	—	**4,000**	**2,600**	**6,600**	—	—	—	—
A3-B1-BTM-092010-6.5	B-1	9/20/2010	6.5	—	<28	75	75	—	—	—	—
SS12-4-093008	B-2	9/30/2008	4.0	—	**2,300**	660	2,960	—	—	—	—
SS12-8-093008	B-2	9/30/2008	8.0	—	<27	<54	<81	—	—	—	—
SS12-16-093008	B-2	9/30/2008	16.0	—	<27	<54	<81	—	—	—	—
A3-1-040810-4	B-2	4/8/2010	4.0	—	1,400	**5,800**	**7,200**	—	—	—	—
A3-B2-P-100510-4.5	B-2	10/5/2010	4.5	—	**5,800**	**4,600**	**10,400**	<0.020	<0.070	<0.070	<0.092
A3-B2-SW-092010-4.0	B-2	9/20/2010	4.0	—	66	540	606	—	—	—	—
A3-B2-BTM-092010-6.5	B-2	9/20/2010	6.5	—	<28	<55	<83	—	—	—	—
A3-4-040810-4	B-3	4/8/2010	4.0	—	**3,200**	680	**3,880**	—	—	—	—
A3-B3-SW-092210-5.0	B-3	9/22/2010	5.0	—	290	1,200	1,490	—	—	—	—
A3-B3-BTM-092210-8.0	B-3	9/22/2010	8.0	—	31	100	131	—	—	—	—
A3-B4-SW-092110-5.0	B-4	9/21/2010	5.0	—	73	370	443	—	—	—	—
A3-B4-SW-102610-3.5	B-4	10/26/2010	3.5	—	**2,800**	480	3,280	—	—	—	—
A3-B4-SW-102610-4.0	B-4	10/26/2010	4.0	—	**1,800**	270	2,070	—	—	—	—
A3-B4-BTM-102810-6.0	B-4	10/28/2010	6.0	—	**3,100**	130	3,230	—	—	—	—
A3-C00-SW-110210-5.0	C-00	11/2/2010	5.0	—	<170	1,500	1,500	—	—	—	—
A3-C0-SW-092910-5.0	C-0	9/29/2010	5.0	—	<140	1,100	1,100	—	—	—	—
A3-C1-SW-092110-5.0	C-1	9/21/2010	5.0	—	<210	**3,100**	3,100	—	—	—	—
A3-C1-SW-102610-4.5	C-1	10/26/2010	4.5	—	1,000	320	1,320	—	—	—	—
A3-C1-BTM-092110-6.5	C-1	9/21/2010	6.5	—	<140	900	900	—	—	—	—
A3-3-040810-4.5	C-2	4/8/2010	4.5	—	**2,700**	780	3,480	—	—	—	—
A3-C2-BTM-092110-8.0	C-2	9/21/2010	8.0	—	64	180	244	—	—	—	—
A3-C3-P-100510-3.2	C-3	10/5/2010	3.2	—	1,000	1,000	2,000	—	—	—	—
A3-C3-BTM-092210-8.0	C-3	9/22/2010	8.0	—	<28	<55	<83	—	—	—	—
A3-C4-BTM-092110-9.0	C-4	9/21/2010	9.0	—	<28	83	83	—	—	—	—
A3-C4-SW-102610-4.5	C-4	10/26/2010	4.5	—	540	130	670	—	—	—	—
A3-C5-SW-092210-5.0	C-5	9/22/2010	5.0	—	270	780	1,050	—	—	—	—

Table 2
Soil Analytical Results for Petroleum Hydrocarbons and BTEX in AOC 3
Woodworth Lakeview Facility
Lakewood, Washington
Farallon PN: 188-002

Sample Identification	Cell Identification	Sample Date	Depth (feet bgs)[1]	Analytical Results (milligrams per kilogram)							
				GRO[3]	DRO[3]	ORO[3]	Total Petroleum Hydrocarbons[4]	Benzene[5]	Toluene[5]	Ethylbenzene[5]	Total Xylenes[5]
A3-D00-SW-092910-5.0	D-00	9/29/2010	5.0	—	140	1,100	1,240	—	—	—	—
A3-D0-SW-092910-4.5	D-0	9/29/2010	4.5	—	<390	**3,800**	**3,800**	—	—	—	—
A3-D0-SW-102610-4.5	D-0	10/26/2010	4.5	—	**7,600**	**9,800**	**17,400**	—	—	—	—
A3-D0-SW-102610-4.3	D-0	10/26/2010	4.3	—	350	**4,400**	**4,750**	—	—	—	—
A3-D0-SW-102610-4.2	D-0	10/26/2010	4.2	—	<830	**8,400**	**8,400**	—	—	—	—
A3-D0-SW-102610-4.4	D-0	10/26/2010	4.4	—	<160	**2,000**	2,000	—	—	—	—
A3-D0-BTM-092910-5.5	D-0	9/29/2010	5.5	—	170	**2,200**	2,370	—	—	—	—
A3-D1-SW-092110-5.0	D-1	9/21/2010	5.0	—	290	**2,500**	2,790	—	—	—	—
A3-D1-BTM-092110-7.0	D-1	9/21/2010	7.0	—	<28	84	84	—	—	—	—
A3-D2-SW-092110-5.0	D-2	9/21/2010	5.0	—	1,600	**4,200**	**5,800**	—	—	—	—
A3-D2-BTM-092110-7.5	D-2	9/21/2010	7.5	—	42	820	862	—	—	—	—
A3-D3-BTM-092110-10.0	D-3	9/21/2010	10.0	—	27	310	337	—	—	—	—
A3-D3-SW-102610-5.0	D-3	10/26/2010	5.0	—	**2,900**	410	3,310	—	—	—	—
A3-D4-BTM-092110-9.0	D-4	9/21/2010	9.0	—	<26	<53	<79	—	—	—	—
A3-D5-SW-092110-6.0	D-5	9/21/2010	6.0	—	120	1,200	1,320	—	—	—	—
A3-E00-SW-110210-5.0	E-00	11/2/2010	5.0	—	<58	540	540	—	—	—	—
A3-E0-SW-092910-5.0	E-0	9/29/2010	5.0	—	<150	1,700	1,700	—	—	—	—
A3-E1-P-092210-5.0	E-1	9/22/2010	5.0	—	**2,800**	530	3,330	<0.066	<0.33	0.066	0.31
A3-E1-BTM-092210-9.0	E-1	9/22/2010	9.0	—	32	<54	32	—	—	—	—
A3-E2-BTM-092210-8.0	E-2	9/22/2010	8.0	—	39	91	130	—	—	—	—
A3-E2-SW-102610-5.0	E-2	10/26/2010	5.0	—	610	**2,300**	2,910	—	—	—	—
A3-E3-SW-092210-6.0	E-3	9/22/2010	6.0	—	67	230	297	—	—	—	—
A3-E4-SW-092210-5.0	E-4	9/22/2010	5.0	—	180	720	900	—	—	—	—
A3-E5-SW-092210-5.5	E-5	9/22/2010	5.5	—	200	590	790	—	—	—	—
A3-F1-SW-092310-5.0	F-1	9/23/2010	5.0	—	980	1,300	2,280	—	—	—	—
A3-F2-SW-092310-5.5	F-2	9/23/2010	5.5	—	<28	<56	<84	—	—	—	—
A3-F2-BTM-092310-8.5	F-2	9/23/2010	8.5	—	<27	<54	<81	—	—	—	—
MTCA Method A Cleanup Levels[6]				**100[7]**	**2,000**	**2,000**	**NC**	**0.03**	**7**	**6**	**9**
Calculated Method B Cleanup Levels[8]				**NC**	**NC**	**NC**	**3,739**	**NC**	**NC**	**NC**	**NC**

NOTES:

Results in **bold** denote concentrations exceed Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Soil cleanup levels (see footnote 6).

Results in cells with a heavy-line border denote concentrations exceed calculated Method B Soil cleanup levels (see footnote 7).

< denotes analyte not detected at or above the reporting limit listed.

— = denotes sample not analyzed

[1] Depth in feet below ground surface (bgs).

[2] Analyzed by Northwest Method NWTPH-Gx.

[3] Analyzed by Northwest Method NWTPH-Dx.

[4] Sum of GRO, DRO, and ORO concentrations

[5] Analyzed by U.S. Environmental Protection Agency (EPA) Method 8260B.

[6] MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as revised November 2007.

[7] The cleanup level for GRO is without the presence of benzene.

[8] Method B Soil Cleanup Level for Unrestricted Land Uses, as calculated using *Workbook Tools for Calculating Soil and Ground Water Cleanup Levels under the MTCA, Revised December 2007.*

AOC = area of concern

DRO = total petroleum hydrocarbons (TPH) as diesel-range organics

GRO = TPH as gasoline-range organics

ORO = TPH as oil-range organics

NC= not calculated

Table ~~15-14~~ 3: Residual Saturation Values.

Adapted from Mercer and Cohen (1990)

Residual Fluid	Medium	*Residual Saturation (R) (l/m3)	Porosity N (cm3/cm3)	Medium Density (g/cm3)	Fluid Density (g/cm3)	**Equivalent Soil Concentration (mg/kg)
Gasoline	**Coarse gravel**	**2.5**	**0.325**	**1.75**	**0.675**	**964 (used as default value for gasoline)**
Gasoline	Coarse sand and gravel	4	0.35	1.65	0.675	1,636
Gasoline	Medium to coarse sand	7.5	0.375	1.55	0.675	3,266
Gasoline	fine to medium sand	12.5	0.375	1.5	0.675	5,625
Gasoline	silt to fine sand	20	0.4	1.4	0.675	9,643
Middle distillates	**Coarse gravel**	**5**	**0.325**	**1.75**	**0.8**	**2,286 (used as default value for diesel fuel)**
Middle distillates	Coarse sand and gravel	8	0.35	1.65	0.8	3,879
Middle distillates	Medium to coarse sand	15	0.375	1.55	0.8	7,742
Middle distillates	fine to medium sand	25	0.375	1.5	0.8	13,333
Middle distillates	silt to fine sand	40	0.4	1.4	0.8	22,857
Fuel oils	Coarse gravel	10	0.325	1.75	0.9	5,143
Fuel oils	Coarse sand and gravel	16	0.35	1.65	0.9	8,727
Fuel oils	Medium to coarse sand	30	0.375	1.55	0.9	17,419
Fuel oils	fine to medium sand	50	0.375	1.5	0.9	30,000
Fuel oils	silt to fine sand	80	0.4	1.4	0.9	51,429

*Residual Saturation (R) = liters of residual NAPL per cubic meter of medium x porosity x 1,000

** Equivalent Soil Concentration = Residual saturation x fluid density ÷ medium density.

- Mercer, J.W. and Cohen, R.M. (1990) A Review of Immiscible Fluids in the Subsurface: Properties, Models, Characterization and Remediation. J. of Contaminant Hydrol. 6 (1990) 107-163. Ecology's default residual saturation values were obtained from Table 3 (p. 120) of this study.

- Middle distillate = Diesel No. 2 Fuel Oil

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

October 6, 2015

Mr. Branislav Jurista
Farallon Consulting
975 5th Avenue NW
Issaquah, WA 98027

Re: Opinion on Proposed Cleanup of the following Site:

- **Site Name:** Woodworth & Co. Lakeview Plant
- **Site Address:** 2800 104th Street South, Tacoma
- **Facility/Site No.:** 1372
- **Cleanup Site No.:** 165
- **VCP Project No.:** SW1012

Dear Mr. Jurista:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your proposed independent cleanup of the Woodworth & Co. Lakeview Plant facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Upon completion of the proposed cleanup, will further remedial action likely be necessary to clean up contamination at the Site?

YES. Ecology has determined that, upon completion of your proposed cleanup, further remedial action will likely be necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following confirmed and suspected releases:

- Total petroleum hydrocarbons-diesel range (TPH-D) and total petroleum hydrocarbons-heavy oil-range (TPH-HO) into the soil.
- TPH-D, trichloroethylene (TCE) and associated halogenated volatile organic compounds (VOCs), arsenic, and lead into the groundwater

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. Farallon Consulting (Farallon), *Remedial Investigation/Feasibility Study Report*, August 19, 2009.

2. Ecology, *Opinion on Proposed Cleanup of the following Site*, February 15, 2011.

3. Farallon, *Soil Excavation Cleanup Action Completion Report*, March 28, 2011.

4. Farallon, *Arsenic and Lead Characterization Lakeview Facility*, December 22, 2014.

5. Farallon, *Focused Feasibility and Disproportionate Cost Analysis Report*, April 14, 2015.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. You can make an appointment by calling the SWRO resource contact at (360) 407-6365.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that, upon completion of your proposed cleanup, **further remedial action** will likely be necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

The Site has been defined through previous investigations conducted from 1983 to 2010 by Farallon Consulting (Farallon) and others as described in the Focused Feasibility Study and Disproportionate Cost Analysis (FFS/DCA) Report (Farallon, April 2015).

Investigations conducted at the Site have detected concentrations of TCE, TPH-D, TPH-HO, and metals (lead and arsenic) in groundwater or soil exceeding applicable MTCA cleanup levels (CULs). Recent (2008-2010) investigations by Farallon included the advancement of soil borings, installation of monitoring wells, and collection of soil, groundwater, and surface water samples (collected from the on-Site storm water detention ponds).

The Site (Figure 2) has been partitioned into five areas of concern (AOCs):

- AOC 1 - Equipment Storage Carport Area.
- AOC 2 - Equipment Parking Area.
- AOC 3 - Former Recycled Stockpile Area.
- AOC 4 - Asphalt-Testing Laboratory Area.
- AOC 5 - Atlas Foundry Waste Area.

AOC 1 is located on the southern portion of the Site, and includes a carport structure that is used to store various equipment used for truck fleet maintenance and operations. TPH-D and TPH-HO have been detected in shallow subsurface soil and groundwater exceeding MTCA Method A CULs.

AOC 2 is located directly north of the truck maintenance shop and is currently used for parking various trailer-mounted equipment and machinery. TPH-HO has been detected in soil exceeding the MTCA Method A CUL.

AOC 3 is located in the western portion of the Site in an area that formerly was used for stockpiling recycled asphaltic concrete. Concentrations of TPH-HO have been detected in shallow subsurface soils exceeding the MTCA Method A CUL.

Farallon conducted excavation of petroleum contaminated soils (PCS) from September to November 2010 in AOCs 1, 2, and 3. These excavations have resulted in the

removal of the source of contamination for groundwater at the Site in AOCs 1, 2, and 3. TPH-D and TPH-HO have not been detected in groundwater above the laboratory practical quantitation limits (PQLs) or MTCA Method A CULs for four consecutive quarters in AOC 1. Petroleum hydrocarbons in groundwater have not been detected above the laboratory PQL in AOC 2 and AOC 3.

AOC 4 is located near the central portion of the Site immediately west to northwest of the roofing shredder building in the reported vicinity of the former Washington State Department of Transportation (DOT) testing laboratory. Concentrations of TCE have been detected in groundwater exceeding the MTCA Method A CULs in both the deep and shallow groundwater-bearing zones as depicted in Enclosure A and in Figures 3 and 4. TCE was additionally detected below MTCA A CULs in the on Site industrial water supply well.

Further subsurface investigations in AOC 4 were conducted by Farallon between July 2012 and January 2013; including the advancement of seven soil borings, as well as five monitoring wells (MWs). According to Figure 6, the borings (B-2 to B-7 and B-9) advanced to characterize soil in AOC 4 were located generally to the south of the presumed former DOT testing laboratory, not within, immediately adjacent to, or surrounding the presumed DOT laboratory location. In addition, the April 2015 report indicates the soil sample data for AOC 4 is present in Table 3, however, the title of the aforementioned table references AOC 5, which is misleading. In the soil samples collected to the south of the presumed DOT laboratory location, TCE or its associated degradation constituents were not detected at concentrations at or exceeding the laboratory PQLs or MTCA Method A CULs in soil. TCE-impacted shallow and deep groundwater zones in AOC 4 are illustrated in Figures 3 and 4, respectively.

AOC 5 is in the area of reported land-filling of foundry waste material in the northeastern portion of the Site (Figure 2). Concentrations of total and dissolved arsenic and lead have been detected in the shallow groundwater-bearing zone exceeding MTCA Method A CULs. Arsenic soil sampling conducted in AOC 5 during previous investigations has exhibited arsenic and lead concentrations less than MTCA Method A CULs. Elevated pH and low oxidation-reduction potential (ORP) recorded at MW-12, (situated in the arsenic/lead shallow groundwater plume) have apparently contributed to the solubility and leaching of lead and arsenic to shallow groundwater. Normal pH and ORP have reportedly been measured at other MWs throughout the Site. The area of delineated lead and arsenic impacted groundwater is depicted in Figures 5 and 6.

Farallon conducted a Site-specific Tier I Vapor Intrusion assessment to evaluate the potential for TCE migration into future structures. TCE concentrations in groundwater

were input into the Johnson and Ettinger Vapor Intrusion Model. TCE concentrations in both shallow and deep groundwater in AOC 4 are protective of the vapor intrusion pathway for the commercial exposure scenario. However, the assumptions used include the emplacement of approximately 30 feet of inert fill material on the ground surface in AOC 4. This differs from existing conditions at the Site.

A cross-section illustrating the shallow, deep, and regional/water-bearing zones is included as Figure 10.

Farallon did a preliminary terrestrial ecological evaluation (TEE) for the Site. The TEE showed the Site does not have any complete ecological pathways. Therefore, the Site qualifies for an exclusion (Farallon, April 2015).

Based on a review of the available information, Ecology has the following comments on the FFS/DCA:

1. AOC 4 is not sufficiently characterized for remedy selection. Additional soil samples need to be collected in the area of the former DOT asphalt testing laboratory, since this is the presumed TCE source area (Farallon, April 2015). Remedy selection cannot begin until further investigation of the source area soils is completed. In particular, please collect soil samples from the upper portion and within the silt/silt and sandy gravels (as shown on Figure 7 in the Farallon April 2015 report), beneath and immediately adjacent to the former DOT laboratory.

   In addition, it is likely additional MWs are necessary to further define the extent of contamination at various depths and within the various water bearing zones in AOC 4.

2. The current AOC 4 Alternative 1 (ICs) does not meet the substantive requirements of MTCA. This alternative relies on dilution and dispersion for cleanup. Ecology does not agree that sufficient source area characterization has been conducted or considered enough remedial alternatives to justify the choice of dilution and dispersion as a remedy.

   AOC 4 Alternative 1 is also unacceptable because the Site will not meet groundwater CULs within a reasonable restoration timeframe. The Feasibility Study (FS) assumes that TCE concentrations will continue to decline along the trend observed during AS/SVE operation. This assumption is unrealistic and likely incorrect. Ecology expects concentrations to increase upon SVE shutdown unless source area TCE removal or reduction is part of the remedy. Additionally, MWs in AOC 4 have not been sampled since June 2013. We recommend resampling these wells to determine

a current TCE concentration baseline and subsequent quarterly sampling to establish a trend.

Following the investigation and further characterization of the AOC 4 source area, please amend the FS to consider several possible cleanup alternatives for AOC 4.

3. Ecology does not agree with the results of the Tier I Vapor Intrusion (VI) Assessment because the assessment assumes that you will place 30 feet of clean fill at the Site. The FS did not include placement of fill/capping in the proposed alternatives. Therefore these conditions cannot be assumed for the assessment. The Tier I VI Assessment must reflect existing conditions at the Site. Also, Ecology does not recommend that a Tier I VI Assessment is completed until further source area soils characterization is performed. Soil gas samples may need to be collected as part of the Tier I VI Assessment.

   Please note, we can only consider Modified Method B calculations that include adjustments to reasonable maximum exposure as remediation levels, not CULs (see WAC 173-340-750(3)(c)(d)). Please reference the allowable modifications to the default assumptions as outlined in WAC 173-340-740(3)(c)(ii).

4. Ecology recommends decommissioning the industrial water supply well because it is within the TCE plume and recent sampling detected TCE in this well. Installation and use of an industrial well at the Site has the potential to affect the distribution of the contaminated groundwater plume. Additionally, the industrial water supply well provides a potential conduit for contaminants to further migrate vertically into the deeper regional aquifer.

   Therefore, upon proposal of a replacement industrial well, Ecology recommends the applicant provide additional information regarding Wellhead Protection Areas (WHPAs) for the proposed well location.
   - A licensed professional engineer or hydrogeologist who is experienced in WHPA delineations needs to prepare this information. A WHPA is a capture zone surrounding a pumping well that will supply groundwater recharge to the well.
   - Please prepare WHPA delineations using criteria and methods identified by the U.S. Environmental Protection Agency. For example, delineation of WHPAs using a numerical model simulation with the Wellhead Analytic Element Model (WhAEM2000). WhAEM2000 is a public domain groundwater flow model that calculates capture zones for wellhead protection area mapping (http://www.epa.gov/athens/software/whaem/).

5. Please define the full extent of the total arsenic and lead groundwater plume in AOC 5. In particular, the Site needs:
   - Additional wells north, west, and northwest of MW-31. Installation of these wells will also provide further control on shallow groundwater contours for the northern portion of the Site.
   - Depending on the extent of contamination at the property line, the Site may also need off-property wells to determine the extent of the plume.
   - The Site also needs additional total arsenic and lead concentration data from the existing wells.

6. As per WAC 173-340-720(9)(b), please perform analyses for compliance monitoring on unfiltered samples. Unfiltered groundwater data are not available for MW-9. Please ensure that you collect unfiltered samples for all future groundwater samples for metals analyses at the Site.

7. Please conduct further assessment of the interrelationship between the shallow, deep, and regional aquifers, specifically the presence of a vertical gradient to determine preferential flow paths between the aquifers. As referenced above, assess the potential influence from the industrial water extraction well on the deep and shallow aquifers.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site do not meet the substantive requirements of MTCA. The Site needs further characterization work before CULs and points of compliance are established.

Soil and Groundwater

MTCA Method A CULs for both soil and groundwater have been adopted for the majority of the Site, with the exception of petroleum contaminated soil (PCS) in AOC 2 and AOC 3, where a Site specific MTCA Method B CUL was established. Groundwater sampling did not detect petroleum hydrocarbons in AOC 2 or AOC 3.

AOC 2 and AOC 3

MTCA Method B Site specific CULs for PCS was adopted in AOC 2 and AOC 3 for TPH-D and TPH-HO. The Site specific CUL calculated for AOC 2 is 3,699 milligrams per kilograms (mg/Kg) and 3,739 mg/Kg for AOC 3. Ecology accepted these CULs (Ecology, February 2011).

Points of Compliance

The point of compliance for soil is established for the protection of groundwater, defined as soil throughout the Site. Contaminants of concern (COCs) in soil have been reportedly cleaned up in AOCs 1, 2, and 3 to concentrations below their respective MTCA Method A CULs (AOC 1) or their respective MTCA Method B site specific CULs (AOC 2 and 3) or were determined to be below laboratory PQLs.

The standard point of compliance for groundwater is defined as the uppermost level of the saturated zone extending vertically to the lowest depth that could potentially be affected by the Site. A conditional point of compliance is deemed acceptable where it is not practicable to meet the CULs throughout the Site within a reasonable time frame, and is to be as close as practicable to the source of COCs on the Site.

3. Selection of cleanup action.

Ecology has determined the cleanup action you proposed for the Site does not meet the substantive requirements of MTCA. Please refer to Section 1 for specific comments.

Cleanup actions conducted on the Site to date include the following:

- In September 2010, PCS was excavated from AOC 1 and transported off Site for disposal. Approximately 6,289 tons of PCS was removed. The depth of the excavation ranged between 8 to 13 feet below ground surface (bgs). A total of 31 confirmation soil samples were collected and analyzed form the excavation sidewalls and base/bottom, indicating that all PCS with a concentration greater than MTCA Method A CULs (2,000 mg/Kg) had been removed (Farallon, March 2011).

- In November 2010, PCS was excavated from AOC 2 and transported off Site for disposal. Approximately 118 tons of PCS was removed. The depth of the excavation ranged between 2 to 4 feet bgs. A total of 11 confirmation soil samples were collected and analyzed form the excavation sidewalls and base/bottom, indicating that all PCS with a concentration greater than MTCA Method A CULs (2,000 mg/Kg) had been removed. Ecology approved a MTCA B Site specific CUL of 3,699 mg/Kg for AOC 2; however, Farallon reportedly excavated PCS to MTCA Method A CULs for AOC 2 (Farallon, March 2011).

- From September to November 2010, PCS was excavated from AOC 3 and transported off Site for disposal. Approximately 1,578 tons of PCS was removed. The depth of the excavation ranged between 5.5 to 10 feet bgs. A

total of 32 confirmation soil samples were collected and analyzed from the excavation sidewalls and base/bottom, indicating that all PCS with a concentration greater than the Ecology approved, MTCA Method B Site specific CUL of 3,739 mg/Kg had been removed (Farallon, March 2011).

- An air sparge/soil vapor extraction (AS/SVE) system was installed in AOC 4. The system was constructed between September 2009 to April 2010, and included the installation of 10 AS wells in the deep groundwater-bearing zone and 12 AS wells in the vadose zones of the shallow and deep groundwater-bearing zones. The AS/SVE system was in operation from November 2010 through February 2013, with continued operation of the SVE component through September 2014. TCE decreases were noted in the five MWs used to monitor and characterize the TCE plumes (SVE-12, MW-2, MW-14, MW-20, and MW-22). Farallon concluded the continued operation of the system would provide minimal results in reducing TCE concentrations.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you proposed will be substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. Opinion is limited to proposed cleanup.

This letter does not provide an opinion on whether further remedial action will actually be necessary at the Site upon completion of your proposed cleanup. To obtain such an opinion, you must submit a report to Ecology upon completion of your cleanup and request an opinion under the VCP.

4. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up your Property under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may resubmit your proposal for our review. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 407-6528 or e-mail at ASCO461@ecy.wa.gov.

Sincerely,

JG Cook, LG
SWRO Toxics Cleanup Program

JGC: knf

Enclosures (1): A – Description and Diagrams of the Site

By certified mail: 91710821333939703880 81

cc: Jeff Woodworth, Woodworth & Co., Inc.
Sharon Bell, Tacoma-Pierce County Health Department
Richelle Perez, Ecology
Steve Teel, Ecology
Dolores Mitchell, Ecology

Enclosure A

Description and Diagrams of the Site

Site Description

The Site is located north of Washington State Route 512, east of Interstate 5, and west of Sales Road South in Section 6, Township 19 North, Range 3 East in Lakewood, Pierce County, Washington (Figure 1). The Site consists of Pierce County Parcel Nos. 0319061135, 0319061136, 0319062075, and 0319062076, together totaling approximately 60 acres. All four parcels were formerly used by Woodworth Capital, Inc., (Woodworth) for the recycling of imported asphalt and concrete debris and for hot- and cold-mix asphalt production. The Site is currently owned by Miles Sand & Gravel, Inc.

The southern portion of the Site is almost entirely asphalt-paved. The Site is currently improved with a truck maintenance shop building, a covered carport used for equipment storage, a covered secondary containment structure, a large roofing shredder building, and several small sheds and modular structures used for storage, office space, and/or warehousing. The Site is additionally improved with a large 10,000 gallon above-ground storage tank (AST) containing asphalt tar, and two 12,000 gallon ASTs containing diesel fuel. An industrial water-supply well near the center portion of the Site provides water reportedly for dust control. The water-supply well head is located in a well house. The extraction well was advanced to a total depth of 187 feet bgs, and is reportedly screened from 107 to 129 feet bgs, below the deeper aquifer into the regional aquifer. Storm water is discharged into two on Site storm water detention ponds, located in the western and northern portions of the Site.

The northern portion of the Site is used as a storage area for miscellaneous inert debris and material.

The southern portion of the Site was formally occupied by a thermodesorption plant used for the treatment and recycling of PCS, and is currently used for parking.

The central portion of the Site is used for asphalt and concrete recycling and for stockpiling raw and crushed material. Crushing equipment, radial stackers, and various stockpiles of sorted debris are located on this portion of the Site.

The soil encountered at the Site is comprised of poorly-graded sands and gravels, separated into a shallow and a deep unit by a layer of silt and silty-gravel. The shallow sand and gravel unit is primarily composed of poorly-graded sands and gravels containing various amounts of silt from the ground surface to a depth of approximately 48 feet bgs. In some areas, the sand and gravel layer is replaced by fill material, which is largely reworked native material or imported material consisting of construction debris. Drilling and test pit explorations were used to identify and delineate the fill material. The silt and silty-gravel layers appear to be a confining layer at the base of the shallow water-bearing zone.

The deep sand and gravel layer consists of fine to coarse sand and gravel with very little fines. The deep sand and gravel unit is underlain by a silt and silty-gravel layer encountered at depths ranging from approximately 77 feet bgs to 127 feet bgs.

Two ground-water bearing zones have been recognized in this study. The shallow water bearing zone ranges in thickness from 8 to 20 feet, appears to be discontinuous and largely unconfined, and was encountered at depths ranging from 5 to 36 feet bgs. MWs in the shallow zone were advanced to depths from approximately 8 to 55 feet bgs. MWs are typically screened at 10 foot intervals from the bottom of casing. The groundwater flow direction in the shallow water-bearing zone was observed to be radially inward towards MW-9 (Figures 8 and 9). A deep water bearing zone encountered across the Site transitions from confined conditions in the east to unconfined conditions in the central portion of the Site and was encountered at depths ranging from 28 to 72 feet bgs. The deep water bearing zone ranges in thickness from 46 to 60 feet. The static groundwater levels in the MWs screened in the deep water bearing zone ranged from 17 to 69 feet bgs. The groundwater flow direction in the deep water bearing zone was observed to be generally north to north-northeast (Figure 10). MWs in the deep zone were advanced to depths from approximately 35 to 127 feet bgs. MWs are also typically screened at 10 foot intervals from the bottom of casing. The shallow water bearing zone is separated from the deep water bearing zone by a discontinuous layer of silt and silty-gravel.

Site History

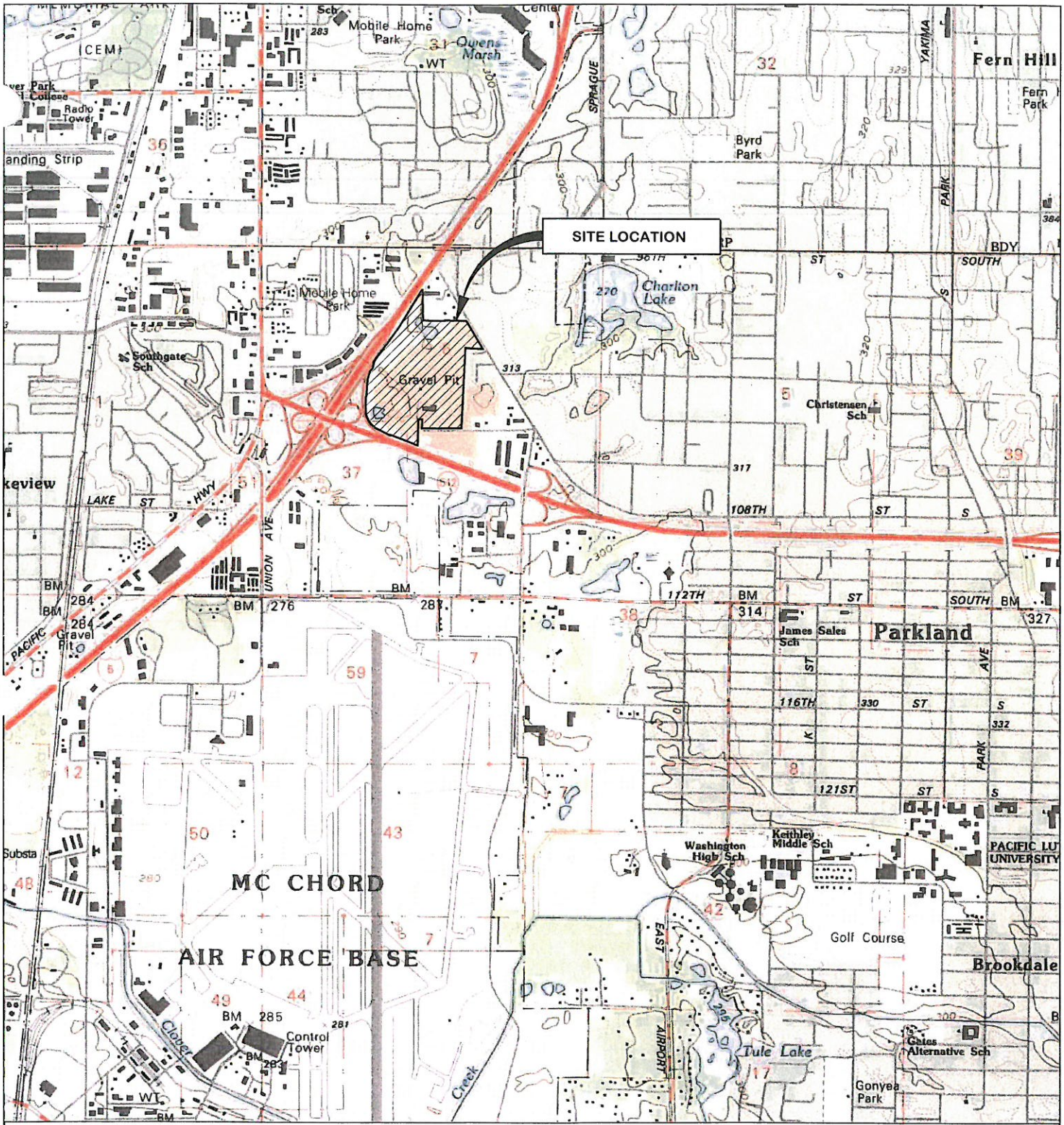
The Site was first developed between 1946 and 1969 for surface sand and gravel mining operations, and hot-mix asphalt production which reportedly commenced on the Site in 1971. Sand and gravel mining operations continued until the late 1980s, at which time the raw materials for asphalt production were imported from off Site locations.

Between the 1980s and early 1990s, the WSDOT established a mobile laboratory on the Site for testing of asphalt mix, which reportedly included use of TCE in the asphalt testing process.

The Site was used from approximately 1981 to 1992 to landfill various inert waste materials, such as clean dirt and rock, waste concrete and asphalt building materials.

Treatment of petroleum-contaminated soil was conducted on the Site from 1991 to 2005 under a Conditional Solid Waste Permit from Tacoma-Pierce County Health Department (TPCHD). In 1994, Woodworth sold the soil treatment facility to TPST Soil Recyclers of Washington (TPST), but remained an owner of the Site. Operations by TPST ended in approximately 2005, at which time the majority of the buildings and equipment used by TPST were demolished or decommissioned.

In August 2003, TPCHD conducted a Site Hazard Assessment of the Woodworth facility. The Site's hazard ranking, an estimation of the potential threat to human health and the environment relative to all other Washington State sites assessed at the time, was determined to be a "2". The ranking ranges from 1 to 5, with 1 representing the highest relative risk and 5 the lowest relative risk.



REFERENCE: 7.5 MINUTE USGS QUADRANGLE TACOMA SOUTH, WASHINGTON. DATED 1991

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Oakland | Sacramento | Irvine

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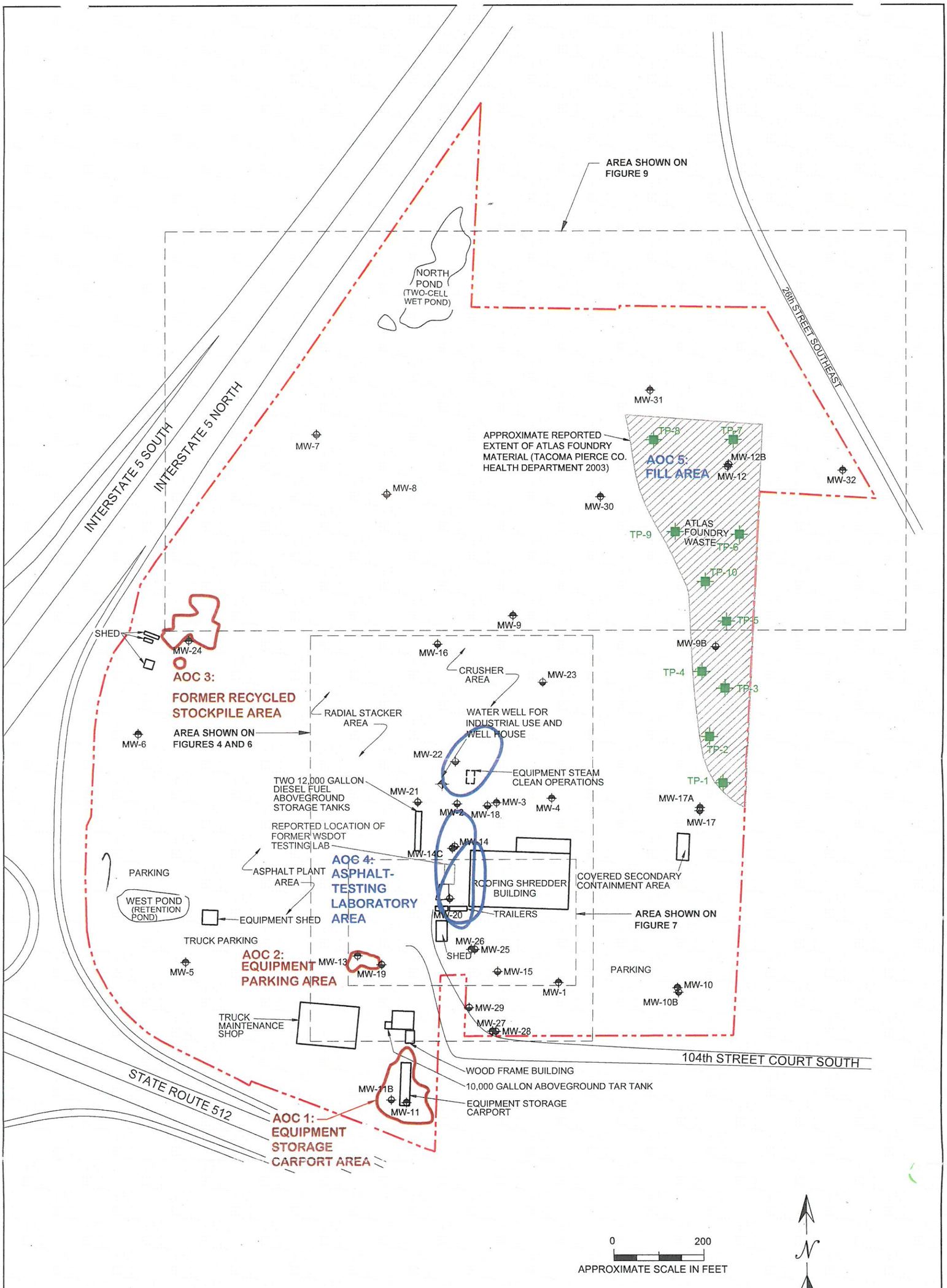
FIGURE 1

SITE VICINITY MAP
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW | Checked By: BJ | Date: 3/27/2015 | Disk Reference: 188002b



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE AREA OF COMPLETED SOIL CLEANUP ACTION
- APPROXIMATE AREA OF GROUNDWATER CLEANUP ACTION
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- MW-8 DECOMMISSIONED MONITORING WELL
- TEST PIT
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

NOTE:
1. AIR SPARGE AND SOIL VAPOR EXTRACTION WELLS BORING B2 THROUGH B7, AND B9 NOT SHOWN ON THIS FIGURE.
2. ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

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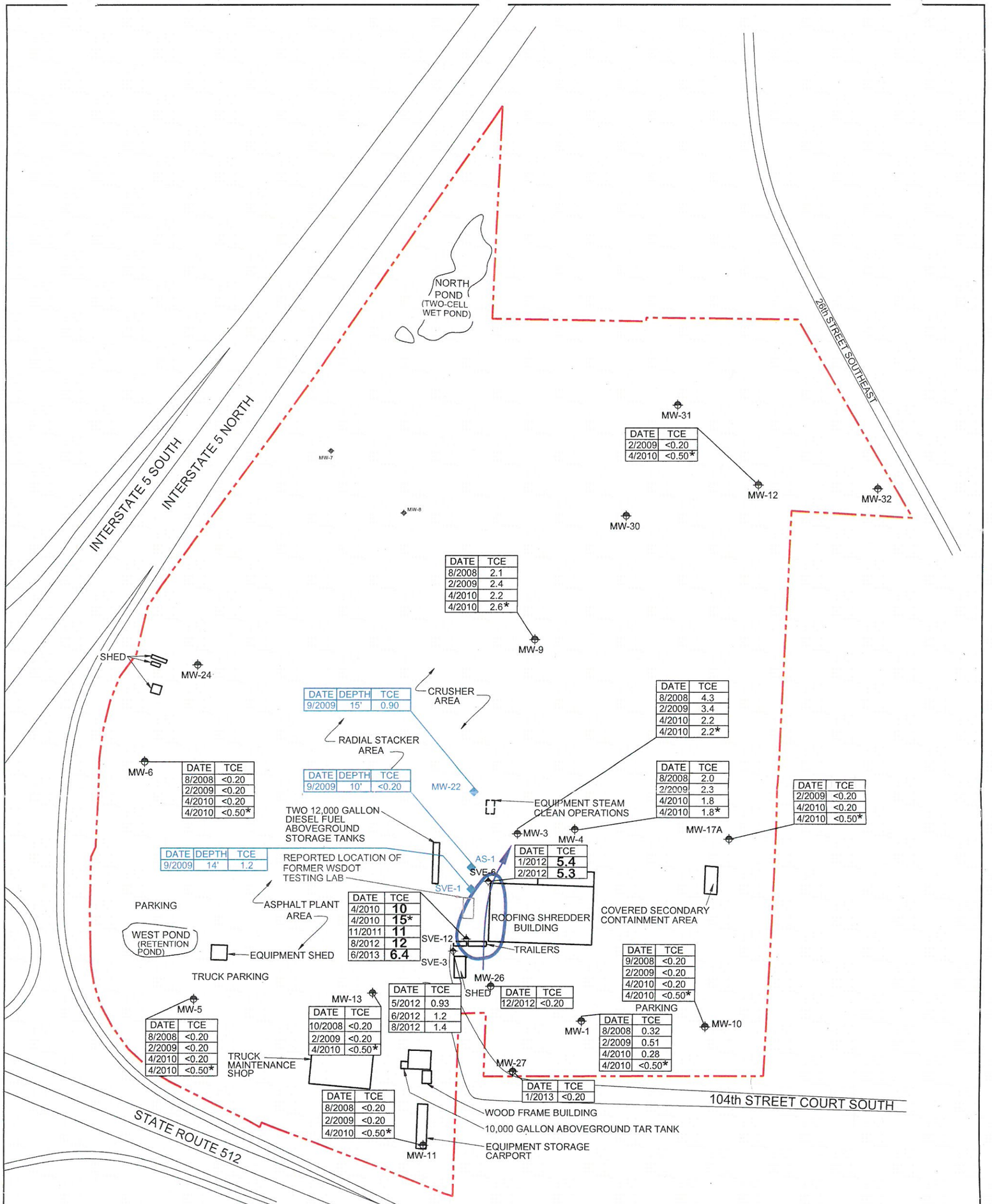
FIGURE 2

SITE PLAN
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW | Checked By: BJ | Date: 3/31/2015 | Disk Reference: 188002b



LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE EXTENT OF TRICHLOROETHENE (TCE) CONCENTRATION IN GROUNDWATER EXCEEDING THE WASHINGTON STATE MODEL TOXIC CONTROL ACT METHOD A CLEANUP LEVEL OF 5 MICROGRAMS PER LITER
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- SVE-12 SOIL VAPOR EXTRACTION WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- RECONNAISSANCE GROUNDWATER SAMPLE COLLECTED IN SHALLOW WATER-BEARING ZONE
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

0 200
APPROXIMATE SCALE IN FEET

N

NOTES:

1. < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
2. RESULTS IN **BOLD** DENOTE CONCENTRATIONS ABOVE APPLICABLE CLEANUP LEVEL.
3. TCE CONCENTRATIONS FOLLOWED BY " * " ARE THE RESULTS PROVIDED BY GEOENGINEERS, INC. FOR THE APRIL 2010 GROUNDWATER SAMPLING EVENT.
4. ALL RESULTS IN MICROGRAMS PER LITER.
5. DEPTHS ARE INDICATED ARE IN FEET BELOW GROUND SURFACE.
6. RESULTS IN BLUE DENOTE RECONNAISSANCE GROUNDWATER SAMPLES

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FIGURE 3

TCE DISTRIBUTION IN SHALLOW WATER-BEARING ZONE
LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 3/31/2015 Disk Reference: 188002b

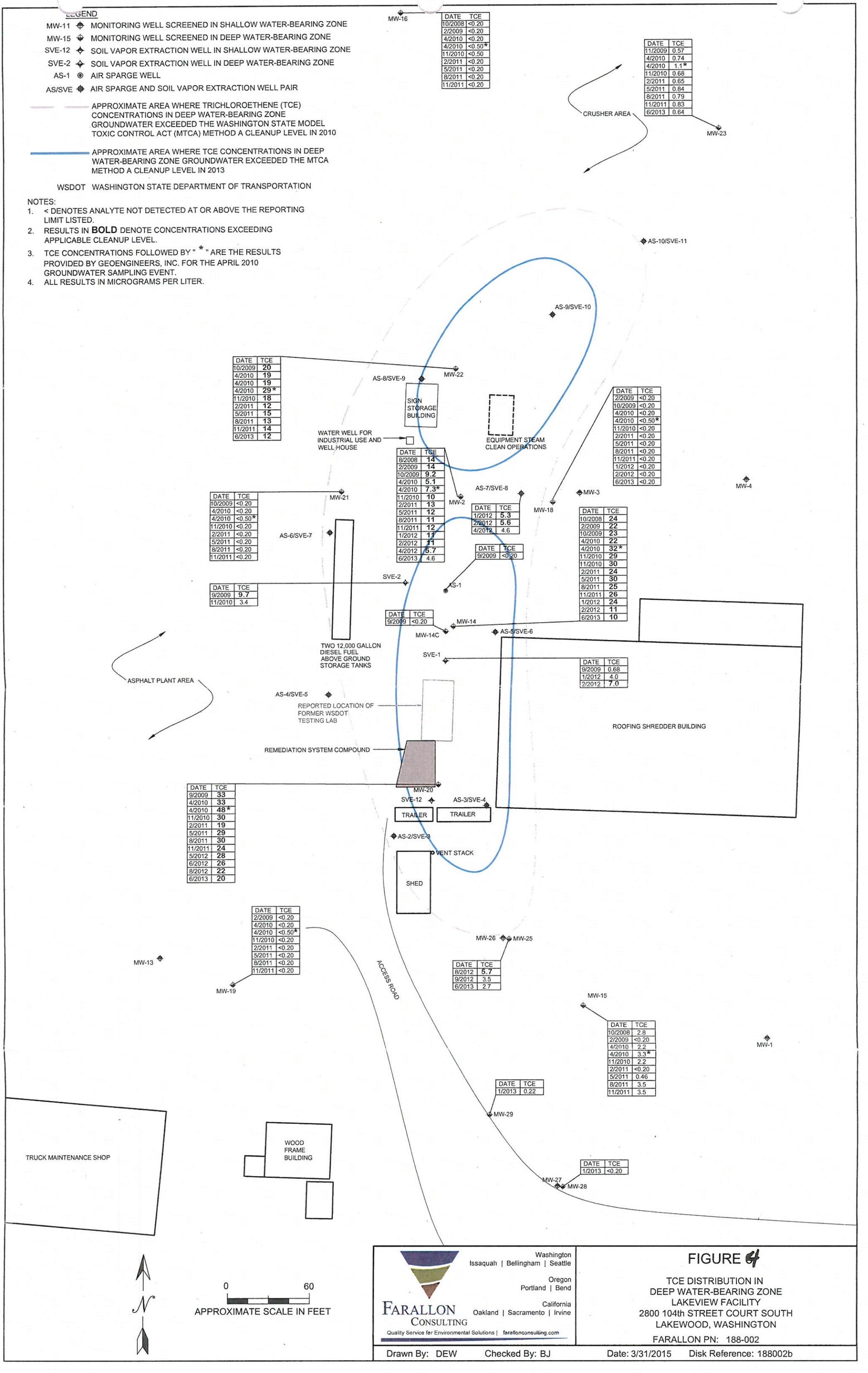

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FIGURE 4

TCE DISTRIBUTION IN
DEEP WATER-BEARING ZONE
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 3/31/2015 Disk Reference: 188002b

INTERSTATE 5 SOUTH

INTERSTATE 5 NORTH

NORTH POND (TWO-CELL WET POND)

26th STREET SOUTHEAST

D

D'

MW-7

MW-8

MW-9

MW-30
DRY

MW-31

MW-32

MW-12B

MW-12

ESTIMATED FLOW DIRECTION FOR SHALLOW WATER-BEARING ZONE

SHALLOW WATER-BEARING ZONE NOT ENCOUNTERED IN THIS AREA

DISSOLVED		
DATE	ARSENIC	LEAD
9/12/2014	**20**	9.6
10/30/2014	**19**	5.5

TOTAL		
DATE	ARSENIC	LEAD
1/12/2009	<3.3	<1.1

DISSOLVED		
DATE	ARSENIC	LEAD
9/12/2014	**7.1**	12

DISSOLVED		
DATE	ARSENIC	LEAD
9/12/2014	<3.0	<1.0

DISSOLVED		
DATE	ARSENIC	LEAD
8/20/2008	<3.0	<1.0

N

0 100
Scale in feet

LEGEND

D D' LINE OF CROSS-SECTION

PROPERTY BOUNDARY

MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE

MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE

MW-8 DECOMMISSIONED MONITORING WELL

NOTES:
1. < DENOTES ANALYTE NOT DETECTED AT OR ABOVE THE REPORTING LIMIT LISTED.
2. RESULTS IN **BOLD** DENOTE CONCENTRATIONS EXCEEDING APPLICABLE CLEANUP LEVEL.
3. ALL RESULTS IN MICROGRAMS PER LITER.
4. AOC = AREA OF CONCERN

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FIGURE 5

ARSENIC AND LEAD DISTRIBUTION IN GROUNDWATER
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 3/31/2015 Disk Reference: 188002b

LEGEND

- BORING LOCATIONS
- MW-11 MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- MW-15 MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- SVE-12 SOIL VAPOR EXTRACTION WELL IN SHALLOW WATER-BEARING ZONE
- SVE-2 SOIL VAPOR EXTRACTION WELL IN DEEP WATER-BEARING ZONE
- AS/SVE AIR SPARGE AND SOIL VAPOR EXTRACTION WELL PAIR

0 30
Scale in feet

N

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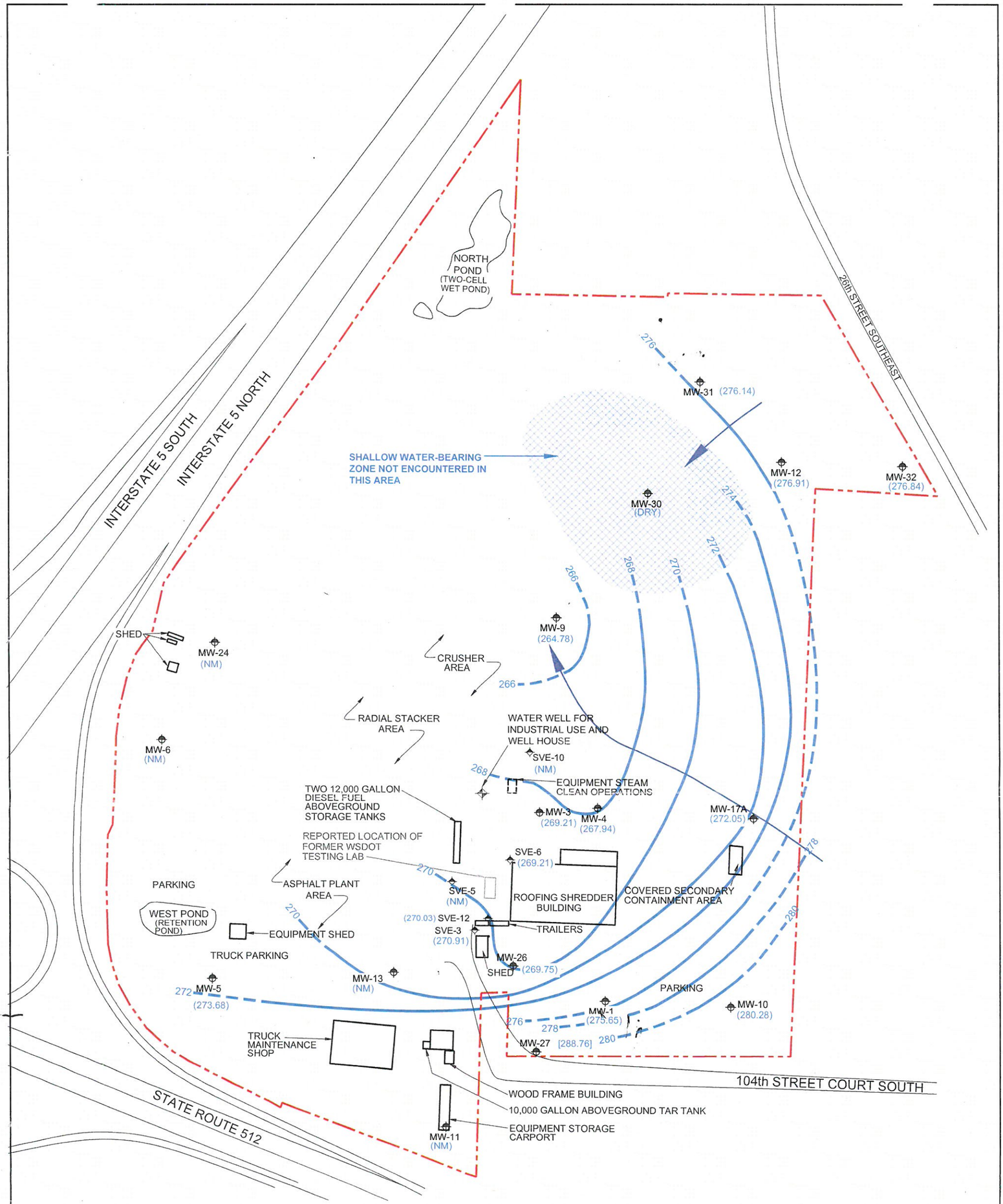
FIGURE 7

BORING LOCAITONS
LAKEVIEW FACILITY
2800 104th STREET COURT SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 3/27/2015 Disk Reference: 188002b



LEGEND

- PROPERTY BOUNDARY
- MW-6 — MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- (269.88) — GROUNDWATER ELEVATION AT WELL SCREENED IN SHALLOW WATER-BEARING ZONE (OCTOBER 2014)
- [269.37] — GROUNDWATER ELEVATION NOT USED IN CONTOURING
- (NM) — NOT MEASURED
- 270 — GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- WSDOT — WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

0 200
APPROXIMATE SCALE IN FEET

N

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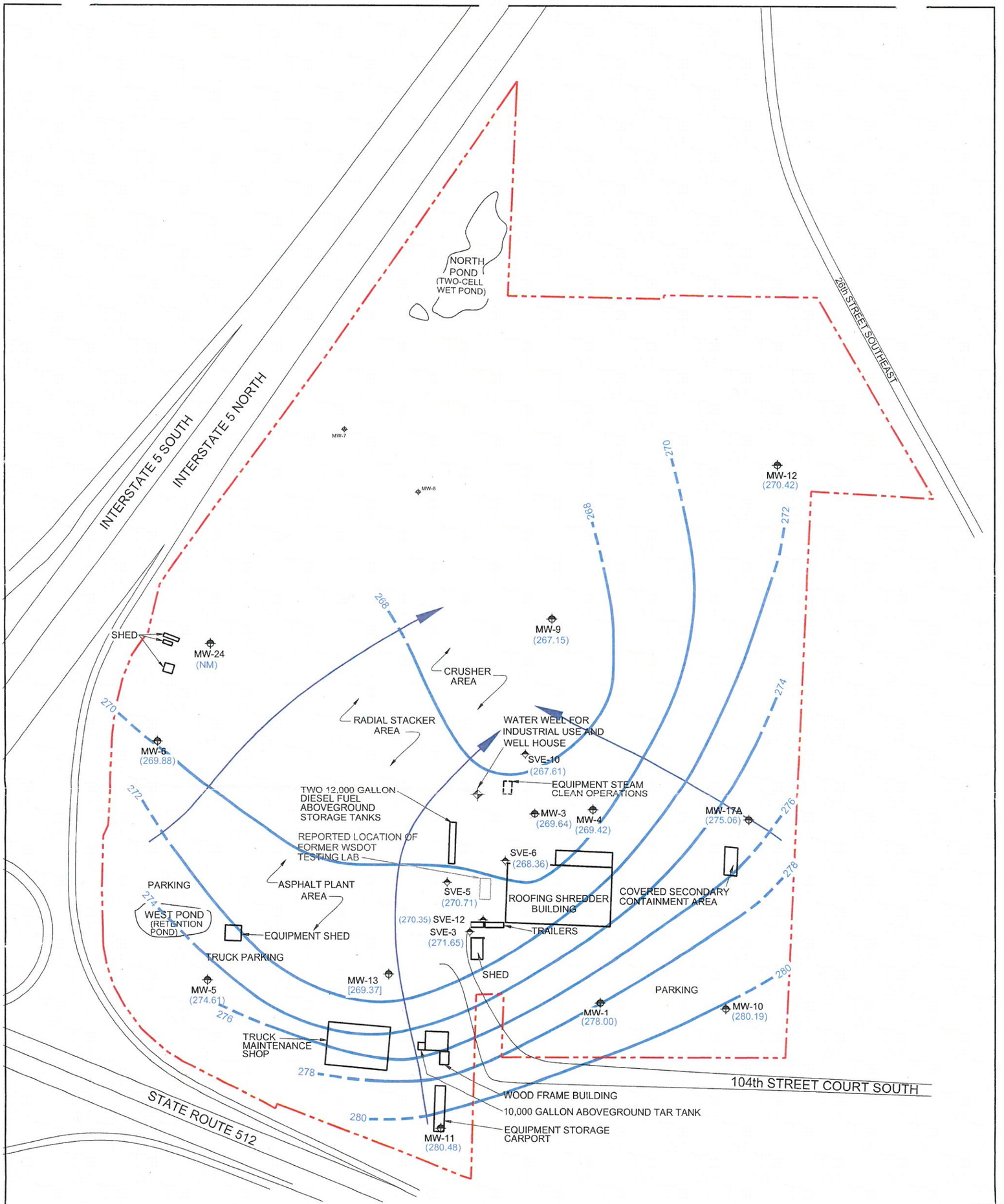
California: Oakland | Sacramento | Irvine

FIGURE 8

GROUNDWATER ELEVATION CONTOURS FOR SHALLOW WATER-BEARING ZONE
(OCTOBER 2014)
LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA

FARALLON PN: 188-002

Drawn By: DEW | Checked By: BJ | Date: 3/31/2015 | Disk Reference: 188002b



LEGEND

- PROPERTY BOUNDARY
- MW-6 — MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE
- EXTRACTION WELL
- (269.88) GROUNDWATER ELEVATION AT WELL SCREENED IN SHALLOW WATER-BEARING ZONE (APRIL 2010)
- [269.37] GROUNDWATER ELEVATION NOT USED IN CONTOURING
- (NM) NOT MEASURED
- 270 — GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE.

0 200
APPROXIMATE SCALE IN FEET

N

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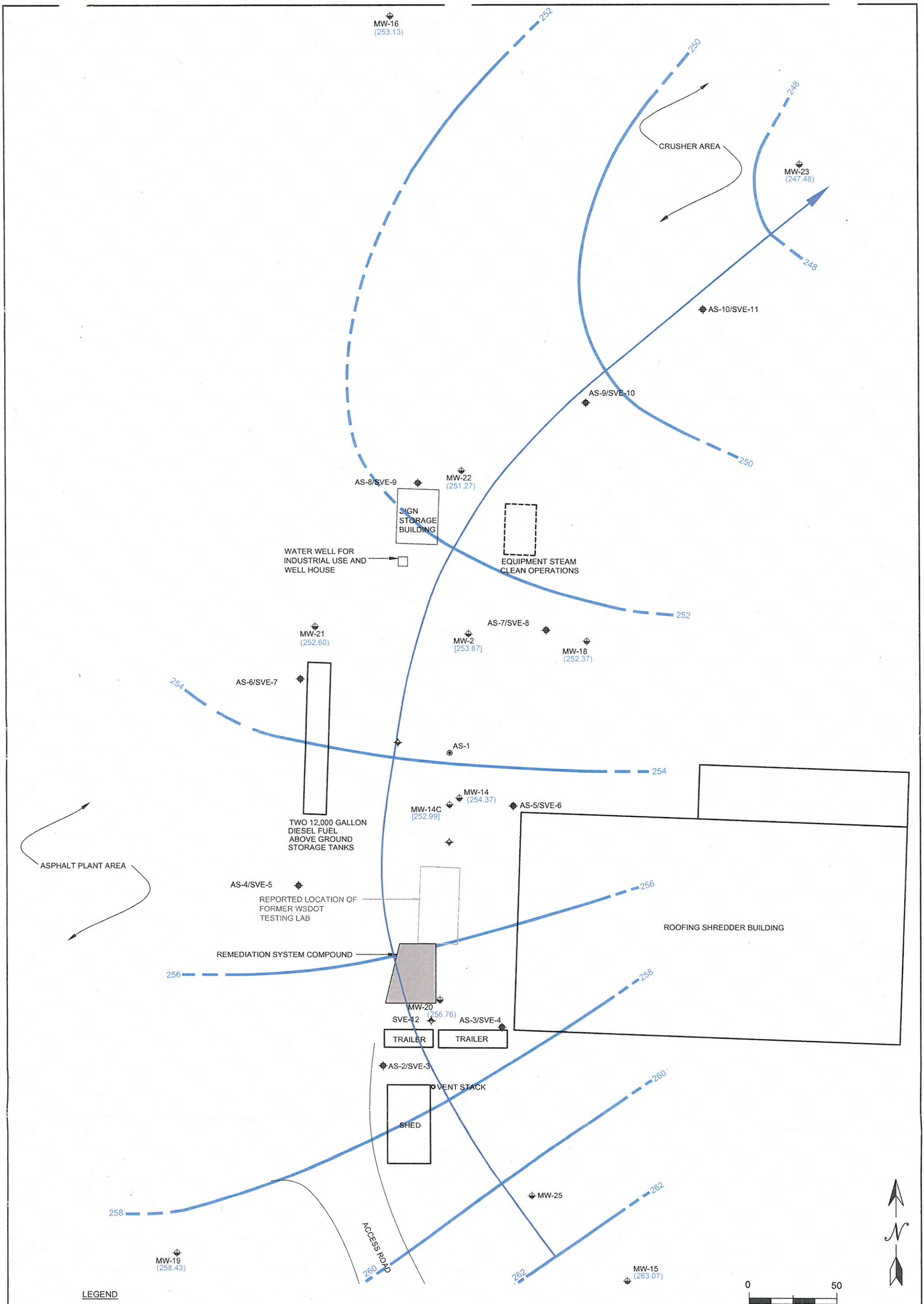
Oregon: Portland | Bend
California: Oakland | Sacramento | Irvine

FIGURE 3

GROUNDWATER ELEVATION CONTOURS FOR SHALLOW WATER-BEARING ZONE
(APRIL 2010)
LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA

FARALLON PN: 188-002

Drawn By: DEW Checked By: BJ Date: 3/31/2015 Disk Reference: 188002b



LEGEND

- MW-14 — MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE
- SVE-1 — SOIL VAPOR EXTRACTION WELL
- AS-1 — AIR SPARGE WELL
- AS/SVE — AIR SPARGE AND SOIL VAPOR EXTRACTION WELL PAIR
- (254.37) — GROUNDWATER ELEVATION AT WELL SCREENED NEAR THE MIDDLE OF THE DEEP WATER-BEARING ZONE (APRIL 2010)
- [252.99] — GROUNDWATER ELEVATION NOT USED IN CONTOURING
- 250 — GROUNDWATER ELEVATION CONTOUR, DASHED WHERE INFERRED
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW
- WSDOT — WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

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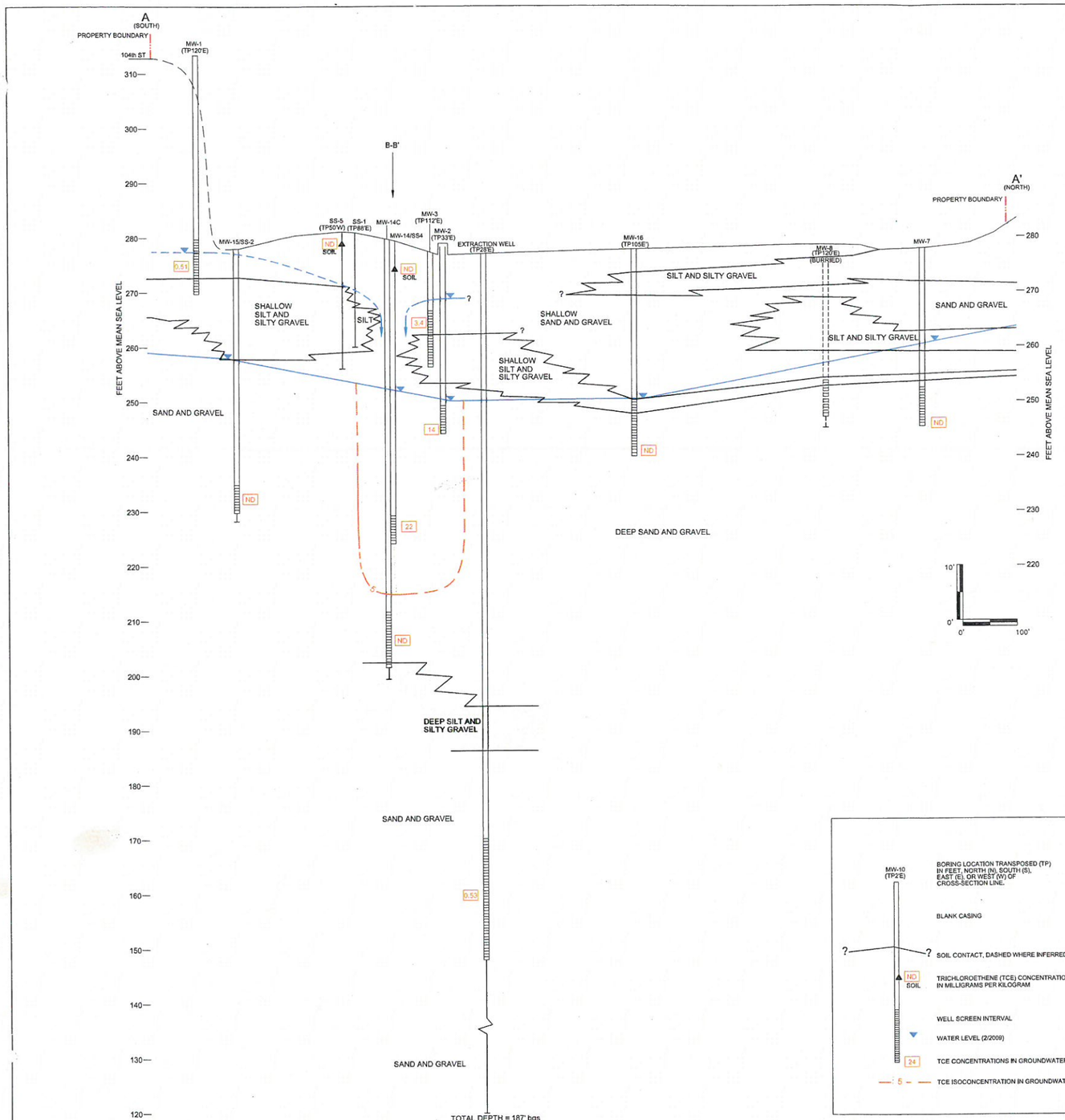
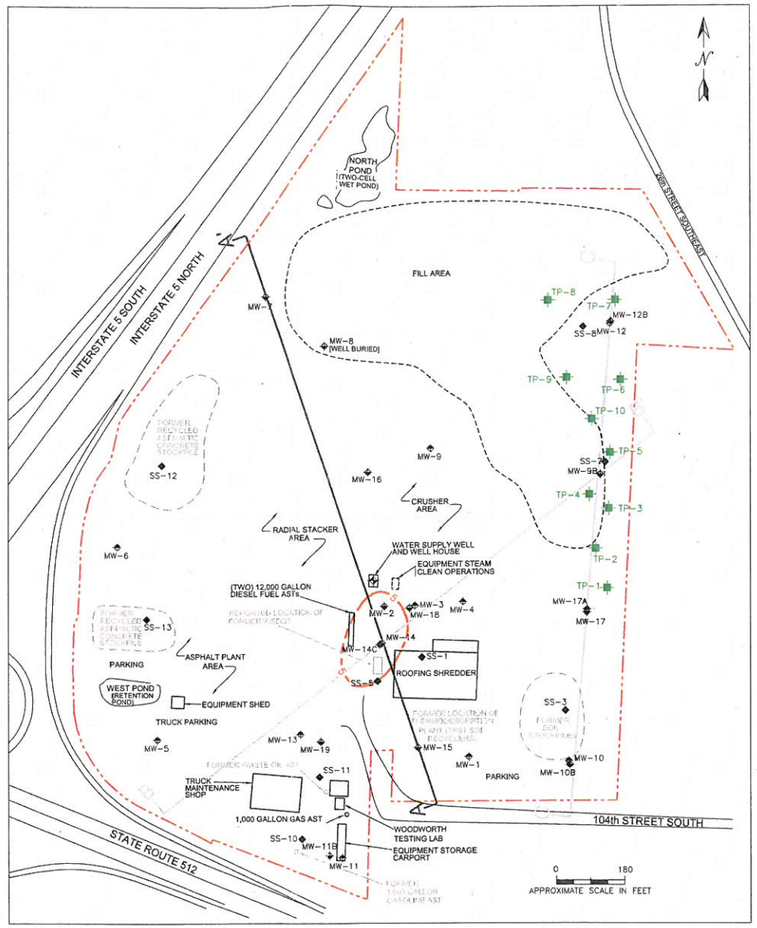
FIGURE 4

GROUNDWATER ELEVATION CONTOURS FOR DEEP WATER-BEARING ZONE
(APRIL 2010)
LAKEVIEW FACILITY
2800 104th ST CT S, LAKEWOOD, WA

FARALLON PN: 188-002

Drawn By: DEW | Checked By: BJ | Date: 3/31/2015 | Disk Reference: 188002b





LEGEND

MW-10 (TP2'E) — BORING LOCATION TRANSPOSED (TP) IN FEET, NORTH (N), SOUTH (S), EAST (E), OR WEST (W) OF CROSS-SECTION LINE.

BLANK CASING

? ? — SOIL CONTACT, DASHED WHERE INFERRED

ND SOIL — TRICHLOROETHENE (TCE) CONCENTRATIONS IN SOIL IN MILLIGRAMS PER KILOGRAM

WELL SCREEN INTERVAL

WATER LEVEL (2/2009)

24 — TCE CONCENTRATIONS IN GROUNDWATER IN MICROGRAMS PER LITER (ug/L)

5 — TCE ISOCONCENTRATION IN GROUNDWATER IN ug/L, DASHED WHERE INFERRED

A A' — LINE OF CROSS-SECTION

SITE BOUNDARY

FORMER STOCKPILE AREAS AND ABOVEGROUND STORAGE TANK (AST) LOCATIONS AS IDENTIFIED ON APEX ENGINEERING PLLC DRAWING (REF. 12795) IN THE AUGUST 11, 2003 TACOMA-PIERCE COUNTRY HEALTH DEPARTMENT SITE HAZARD ASSESSMENT REPORT.

MW-11 — MONITORING WELL SCREENED IN SHALLOW WATER-BEARING ZONE

MW-15 — MONITORING WELL SCREENED IN DEEP WATER-BEARING ZONE

EXTRACTION WELL

SS-10 — SOIL SAMPLE

TEST PIT

WSDOT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION

ALL LOCATIONS OF SITE FEATURES ARE APPROXIMATE AND ASSEMBLED FROM 2008 AERIAL PHOTOGRAPH, UNLESS OTHERWISE NOTED. MONITORING WELL LOCATIONS WERE SURVEYED FOR HORIZONTAL AND VERTICAL COORDINATES BY A LICENSED SURVEYOR IN SEPTEMBER AND OCTOBER 2008, AND IN FEBRUARY 2009.

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FIGURE 7

CROSS-SECTION A–A'
WOODWORTH LAKEVIEW FACILITY
2800 104th STREET SOUTH
LAKEWOOD, WASHINGTON

FARALLON PN: 188-001

Drawn By:DEW | Checked By: BJ | Date:6/20/09 | Disk Reference:CROSECTION5

ATTACHMENT B
BORING LOGS

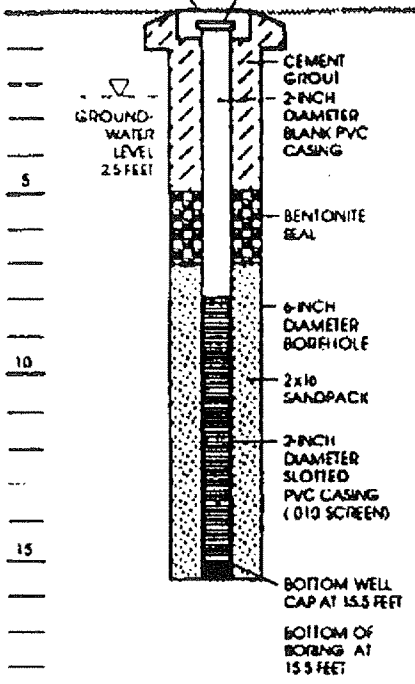
RESPONSE TO LETTER REGARDING ECOLOGY COMMENTS AND CORRECTIONS ON FARALLON MEETING SUMMARY
Lakeview Facility
Lakewood, Washington

Farallon PN: 188-002

ATEC Associates, Inc.

RECORD OF SUBSURFACE EXPLORATION

WELL CONSTRUCTION



LITHOLOGY

Graphic Log

Description
SANDY GRAVEL (GM), light brown, gravels are subrounded and up to 2 inches in diameter, very loose, dry.
Asphalt fill. Micro-tip reading for the sample interval from 2-4 feet reflects the hydrocarbon content of the asphalt.
Groundwater encountered @ 2.5 feet.
SANDY GRAVEL (GM), gray to black, gravels are subangular to subrounded up to 3 inches in diameter, sand is fine grained, loose, wet.
SILTY SANDY GRAVEL (GM), dark gray, gravels subrounded to 1 inch in diameter, loose to medium dense, wet.
Total depth of boring 15.5 feet. Sample driven to 16.0 feet

TEST DATA

Sample No and Interval /(Time)	Penetration Rate (4 @ 6 inches)/ %Recovery	MICRO-TIP (ppm) Core
MW-11-0-2 (09:35)	6/24/50-5" 75%	0
MW-11-2-4 (10:10)	49/26/31/43 50%	31.1
MW-11-4-6 (10:20)	17/50-5" 50%	5.6
MW-11-6-8 (10:35)	20/50-5" 50%	16.2
MW-11-8-10 (10:41)	17/21/8/10 25%	2.7
MW-11-10-12 (10:47)	2/3/10/6 25%	12.5 @ 11.5-12'
MW-11-12-14 (10:56)	3/6/21/27 100%	1.7
MW-11-14-16 (11:05)	13/25/23/31 100%	3.0

DRAFT

Date Started: 06/22/92
Date Completed: 06/22/92
Drill Foreman: T. Smith
Geologist: M. J. Gandar
Approved by: M. J. Gandar, R.G

Boring Method: Air Rotary
Sampler Type: Spoon Sampler
Hammer Wt./Drop: 140 lbs/30 in.
Spoon Sampler OD: 2.0 in.
Approximate Well Elevation:

EXPLANATION

Clay
Silt
Sand
Gravel
Sample Interval

WELL CONSTRUCTION AND LITHOLOGY FOR WELL MW-11

PROJECT NAME: WOODWORTH & COMPANY

PROJECT NO. 07285

07106V2/M Keenan

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975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW13 / SS6

Client: Woodworth & Company, Inc.
Project: Woodworth Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-001

Logged By: Jon Peterson

Date/Time Started:	10/07/08 0930	**Sampler Type:**	Sonic core bag
Date/Time Completed:	10/07/08 1200	**Drive Hammer (lbs.):**	NA
Equipment:	Sonic LAR	**Depth of Water ATD (ft bgs):**	17, 20
Drilling Company:	Boart-Longyear	**Total Boring Depth (ft bgs):**	25
Drilling Foreman:	Jeremy Thompson	**Total Well Depth (ft bgs):**	24
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm*)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		Poorly-graded sand with gravel (Sand 60%, gravel 40%), fine sand, coarse gravel, tan, loose, dry, no odor	SP							Concrete
		Gravelly silt with sand (Silt 50%, gravel 30%, sand 20%), coarse gravel, fine sand, tan, soft, moist, oily- odor in gray-stained clumps of sand, no sheen	ML		90		1.9	SS6-2.5-100708 @ 0945		
		2.5-5' bgs: moist, no odor, no sheen								
5										2" diam PVC casing
					100					
10										Bentonite seal
					90		0.0	SS6-11-100708 @ 1000		
15										10/20 sand pack
		Poorly graded gravel with sand (Gravel 60%, sand 40%), coarse gravel, fine sand, gray, loose, wet, solvent-like odor	GP		90		2.5	SS6-17-100708 @ 1020		
		Gravelly silt with sand (Silt 50%, gravel 30%, sand 20%), coarse gravel, fine sand, tan, soft, moist, no odor	ML							
20		Poorly graded gravel with sand (Gravel 60%, sand 40%), coarse gravel, fine sand, gray, loose, wet, no odor	GP							
			ML							
		Gravelly silt with sand (Silt 50%, gravel 30%, sand 20%), coarse gravel, fine sand, tan, soft, moist, no odor	ML							0.010 slot PVC well screen
		Gravelly silt (Silt 60%, gravel 40%), coarse, gray, stiff, moist, no odor								
25		Gravelly silt with sand (Silt 50%, gravel 30%, sand 20%), coarse gravel, fine sand, gray, medium stiff, wet, no odor	ML							Bentonite plug

Well Construction Information

Monument Type: Flush
Casing Diameter (inches): 2
Screen Slot Size (inches): 0.010
Screened Interval (ft bgs): 14-24

Filter Pack: 10/20 sand
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): 284.97
Top of Casing Elevation (ft): 284.73
Boring Abandonment: NA
Surveyed Location: X: Y:

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Issaquah, Washington 98027

Log of Boring: MW-24

Client: Woodworth Capital, Inc.
Project: Woodworth Lakeview Facility
Location: Lakewood, Washington

Farallon PN: 188-002

Logged By: J. Peterson

Date/Time Started:	10/05/10 0830	**Sampler Type:**	Macrocore
Date/Time Completed:	10/05/10 1045	**Drive Hammer (lbs.):**	Auto
Equipment:	Power Probe	**Depth of Water ATD (ft bgs):**	Rose to 4' bgs
Drilling Company:	ESN-NW	**Total Boring Depth (ft bgs):**	7.5
Drilling Foreman:	Noel	**Total Well Depth (ft bgs):**	7.5
Drilling Method:	Direct Push		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0-3.5': Sandy gravel, fine gravel, fine sand, no odor (overburden removed)	GP							
		3.5-6.5': Silty sand with gravel (45% sand, 20% silt, 35% gravel), fine to medium sand, fine to coarse gravel, gray, moist to wet, petroleum-like odor, asphalt debris.	SM							Cap Concrete; Bentonite Seal; Sand Pack; 0.75-Inch Diameter 0.010-Slot Screen
5		6.5-7.5': Silty gravel (50% gravel, 30%silt, 20% sand), fine to coarse gravel, fine sand, gray to tan, odor and stain decreasing with depth, absent by 7.5' bgs.	GM							

Well Construction Information

Monument Type: Flush Mount
Casing Diameter (inches): 3/4 inch
Screen Slot Size (inches): 0.01
Screened Interval (ft bgs): 5.5-7.5

Filter Pack: 2-12
Surface Seal: Concrete
Annular Seal: Bentonite

Ground Surface Elevation (ft): NA
Top of Casing Elevation (ft): NA
Boring Abandonment: NA
Surveyed Location: X: NA Y: NA

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Issaquah, Washington 98027

Log of Boring: MW-30

Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/9/14 @ 1030	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/9/14 @ 1415	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	Dry
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	70.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	38.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
0		0.0-1.1' bgs: Silty SAND with gravel Fill (65% sand, 20% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, light-brown, moist, no odor, no sheen. Subangular gravel.	SM						Monument
		1.1-4.9' bgs: SILT with gravel (60% silt, 35% gravel, 5% sand), fine to coarse gravel, fine sand, black, moist, organic odor, no sheen.	ML	100	NA	0.0			Concrete
				100	NA	0.2	MW-30-3.0	X	
5		4.9-6.8' bgs: Silty SAND with gravel (65% sand, 20% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, light-grey, moist, no odor, no sheen. Subrounded to subangular grey gravel.	SM						
		6.8-10.5' bgs: Silty SAND with gravel (60% sand, 25% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, light-brown, moist, no odor, no sheen. Subrounded grey gravel.	SM	100	NA	0.0			
10				100	NA	0.0			
		10.5-11.8' bgs: Silty SAND with gravel (55% sand, 30% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, dark-grey, moist, no odor, no sheen. Subrounded grey gravel.	SM						
		11.8-21.2' bgs: Silty SAND with gravel (60% sand, 20% silt, 20% gravel), fine to medium sand, fine to coarse gravel, brown, moist, no odor, no sheen. Subrounded grey gravel, 3 to 4-inch cobbles 15 to 20-feet bgs.	SM				MW-30-13.0		
15				100	NA	0.1			Casing
				100	NA	0.0			Bentonite Seal
				100	NA	0.0			
20									
		21.2-24.1' bgs: Silty SAND with gravel (50% sand, 35% silt, 15% gravel), fine to medium sand, fine to coarse gravel, dark-grey, moist, no odor, no sheen. Subrounded grey gravel.	SM	100	NA	0.0			
				100	NA	0.0	MW-30-23.0		

Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	304.20'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	303.66'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	28.0-38.0	**Boring Abandonment:**	NA		**Y:** NA

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Issaquah, Washington 98027

Log of Boring: MW-30

Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/9/14 @ 1030	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/9/14 @ 1415	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	Dry
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	70.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	38.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
25	24.1-27.5' bgs: SILT with gravel (75% silt, 10% sand, 15% gravel), fine to coarse gravel, fine sand, greyish-brown, moist, no odor, no sheen.	ML	100	NA	0.2			Bentonite Seal
	27.5-28.5' bgs: Poorly graded SAND (90% sand, 5% silt, 5% gravel), fine to medium sand, fine to coarse gravel, brown, moist, no odor, no sheen. Subangular grey gravel.	SP	100	NA	0.0			Sand
		ML			0.0	MW-30-29.0	X	
30	28.5-29.8' bgs: Sandy SILT (60% silt, 35% sand, 5% gravel), fine to medium sand, fine to coarse gravel, brown, moist, slight odor, no sheen. Subrounded grey and black gravel.	ML						
	29.8-34.5' bgs: Sandy SILT (60% silt, 35% sand, 5% gravel), fine to medium sand, fine to coarse gravel, brown, moist, no odor, no sheen. Subrounded grey and black gravel, and 6-inch round grey cobble at 32-feet bgs.		100	NA	0.0			Screen
			100	NA	0.0			
35	34.5-35.4' bgs: Sandy SILT (65% silt, 25% sand, 10% gravel), fine sand, fine to coarse gravel, yellowish-brown, moist, no odor, no sheen.	ML	100	NA	0.1			
	35.4-37.5' bgs: Silty SAND (55% sand, 40% silt, 5% gravel), fine to medium sand, fine to coarse gravel, brown, moist, no odor, no sheen.	SM			0.3	MW-30-37.0	X	
	37.5-44.3' bgs: SILT with gravel (80% silt, 5% sand, 15% gravel), fine to coarse gravel, fine sand, dark-grey, moist, no odor, no sheen. Subrounded gravel.	ML	100	NA	0.0			End cap
40			100	NA	0.0			
			100	NA	0.0			
45	44.3-54.7' bgs: Well-graded GRAVEL with silt and sand (55% gravel, 25% silt, 20% sand), fine to coarse gravel, fine to coarse sand, light-brown, moist, no odor, no sheen. Black and grey subrounded gravel.	GW	100	NA	0.0	MW-30-45.0		

Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	304.20'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	303.66'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	28.0-38.0	**Boring Abandonment:**	NA		**Y:** NA

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Issaquah, Washington 98027

Log of Boring: MW-30

Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/9/14 @ 1030	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/9/14 @ 1415	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	Dry
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	70.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	38.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
50					100	NA	0.0			
					100	NA	0.0			
					100	NA	0.0			
55		54.7-64.5' bgs: Silty SAND with gravel (55% sand, 25% silt, 20% gravel), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen. Black and grey subrounded to subangular gravel.	SM				0.1	MW-30-55.0		
					100	NA	0.0			
					100	NA	0.0			Bentonite Seal
60					100	NA				
					100	NA	0.0			
					100	NA	0.0			
65		64.5-66.5' bgs: SILT with gravel (60% silt, 30% gravel, 10% sand), fine to coarse gravel, fine to coarse sand, brown, wet (driller added water), no odor, no sheen.	ML							
		66.5-70.0' bgs: Well-graded GRAVEL with silt and sand (70% gravel, 20% sand, 10% silt), fine to coarse gravel, fine to coarse sand, brown, wet (driller added water), no odor, no sheen.	GW-GM		100	NA	0.0			
					100	NA	0.0			
70										

Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	304.20'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	303.66'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	28.0-38.0	**Boring Abandonment:**	NA		**Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-31

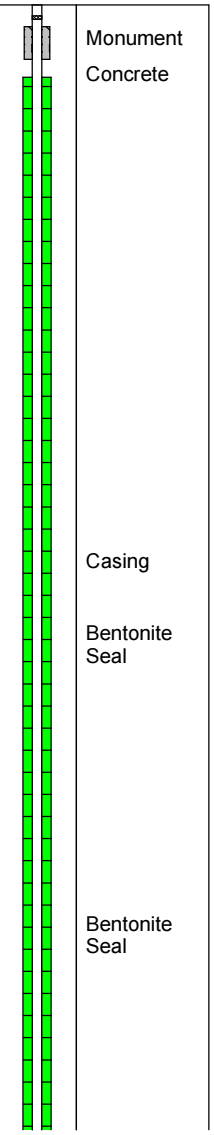
Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/8/14 @ 1435	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/8/14 @ 1615	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	48'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	60.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	56.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed
0	0.0-1.6' bgs: Silty SAND with gravel Fill (65% sand, 20% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, light-brown, moist, no odor, no sheen. Subangular gravel.	SM	100	NA	0.0		
	1.6-3.8' bgs: Silty SAND with gravel Fill (60% sand, 25% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen.	SM	100	NA	0.0	MW-31-3.0	X
5	3.8-8.4' bgs: Silty SAND with gravel Fill (45% sand, 40% silt, 15% gravel), fine to medium sand, fine to coarse gravel, grey, moist, no odor, no sheen.	SM	100	NA	0.0		
10	8.4-12.5' bgs: Silty SAND with gravel (50% sand, 30% silt, 20% gravel), fine to medium sand, fine to coarse gravel, blackish-brown, moist, slight organic odor, no sheen. Wood debris.	SM	100	NA	0.0	MW-31-10.0	
15	12.5-16.5' bgs: SILT with gravel (65% silt, 20% gravel, 15% sand), fine to coarse gravel, fine to medium sand, grey, hard, moist, no odor, no sheen.	ML	100	NA	0.0		
	16.5-19.2' bgs: Silty SAND (60% sand, 30% silt, 10% gravel), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen.	SM	100	NA	0.0		
20	19.2-21.5' bgs: Sandy SILT with gravel (50% silt, 30% sand, 20% gravel), fine sand, fine to coarse gravel, grey, moist, no odor, no sheen.	ML	100	NA	0.0		
	21.5-22.5' bgs: Silty SAND (70% sand, 25% silt, 5% gravel), fine to coarse sand, fine to coarse gravel, light-brown, moist, no odor, no sheen.	SM	100	NA	0.4	MW-31-23.0	
25	22.5-26.5' bgs: SILT with gravel (65% silt, 20% gravel, 15% sand), fine to coarse gravel, fine sand, grey, moist, no odor, no sheen. Observe subround grey gravel, and 4-inch round cobbles 23 to 25 feet bgs.	ML	100	NA	0.1		
	26.5-32.1' bgs: SILT (90% silt, 5% sand, 5% gravel),fine to medium sand, fine to coarse gravel, grey, moist, no odor, no sheen.	ML	100	NA	0.0		
30							



Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	325.19'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	324.89'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	46.0-56.0	**Boring Abandonment:**	NA		**Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-31

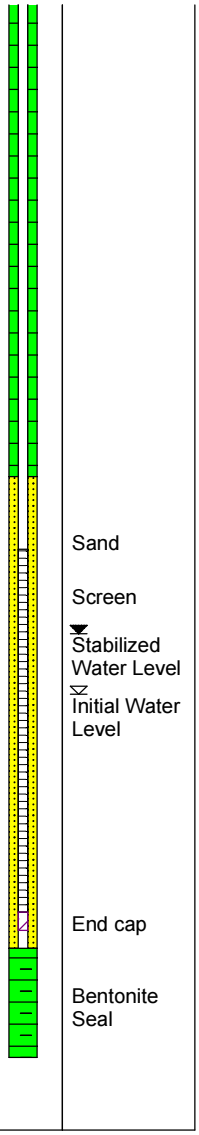
Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/8/14 @ 1435	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/8/14 @ 1615	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	48'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	60.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	56.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed
			100	NA	0.0		
	32.1-34.3' bgs: SILT (95% silt, 5% gravel), fine to coarse gravel, grey, moist, no odor, no sheen.	ML	100	NA	0.0		
35	34.3-38.5' bgs: Silty SAND with gravel (65% sand, 20% silt, 15% gravel), fine to medium sand, fine to coarse gravel, dark-grey, moist, no odor, no sheen. 4 to 6-inch subrounded grey cobbles 35 to 38 feet bgs.	SM	100	NA	0.0	MW-31-35.0	
	38.5-39.2' bgs: Silty SAND (65% sand, 30% silt, 5% gravel), fine to medium sand, fine to coarse gravel, dark-grey, moist, no odor, no sheen.	SM	100	NA	0.0		
40		RK					
	39.2-40.5' bgs: Rock (95% rock, 5% silt), grey, moiost, no odor, no sheen. 4 to 6-inch subrounded grey cobbles.	SM	100	NA	0.0		
	40.5-44.5' bgs: Silty SAND with gravel (60% sand, 25% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, tan, moist, no odor, no sheen.		100	NA	0.0		
45		SM	100	NA	0.0	MW-31-45.0	X
	44.5-45.5' bgs: Silty SAND with gravel (60% sand, 25% silt, 15% gravel), fine to medium sand, fine to coarse gravel, black, moist, odor, no sheen. Yellow-brick debris.	ML					
	45.5-47.5' bgs: SILT with gravel (80% silt, 15% gravel, 5% sand), fine to coarse gravel, fine sand, reddish-tan, moist to slightly wet, no odor, no sheen.	ML	100	NA	0.0	MW-31-48.0	
50		SM					
	47.5-50.0' bgs: SILT (95% silt, 5% gravel), white, dry to moist, no odor, no sheen. 4 to 6 inch subrounded to rounded cobbles.		100	NA	0.0		
	50.0-56.5' bgs: Silty SAND (70% sand, 25% silt, 5% gravel), fine to coarse sand, fine to coarse gravel, brown, wet, no odor, no sheen.		100	NA	0.0		
55						MW-31-55.0	X
	56.5-60.0' bgs: SILT (100% silt), grey, wet, no odor, no sheen.	ML	100	NA	0.1		
			100	NA	0.0		
60			100	NA			



Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	325.19'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	324.89'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	46.0-56.0	**Boring Abandonment:**	NA		**Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-32

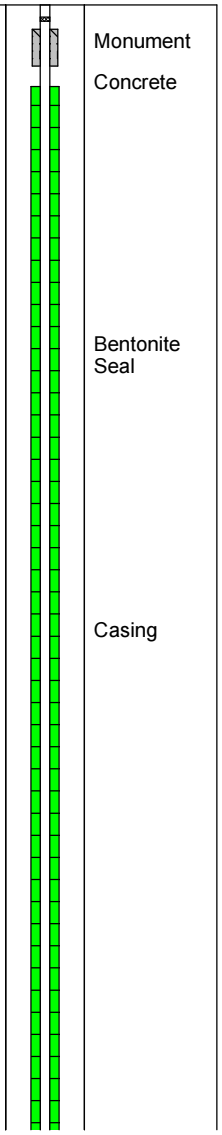
Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/8/14 @ 0940	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/8/14 @ 1125	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	38'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	50.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	45.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Lithologic Description	USCS	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed
0	0.0-1.2' bgs: Silty GRAVEL with sand Fill (60% gravel, 20% silt, 20% sand), fine to coarse gravel, fine to medium sand, brown, moist, no odor, no sheen. Subangular gravel.	GM					
		SM	100	NA	0.0		
	1.2-2.3' bgs: Silty SAND with gravel Fill (65% sand, 20% gravel, 15% silt), fine to coarse sand, fine to coarse gravel, dark-brown, moist, no odor, no sheen. Subangular gravel.	SM	100	NA	0.0	MW-32-3.0	X
		SM					
5	2.3-3.1' bgs: Silty SAND (75% sand, 20% silt, 5% gravel), fine to medium sand, fine to coarse gravel, tan, moist, no odor, no sheen. Subrounded gravel.						
	3.1-6.5' bgs: Silty SAND with gravel Fill (65% sand, 20% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, brown, moist, no odor, no sheen. Subrounded to subangular black and grey gravel.	ML	100	NA	0.0		
		ML	100	NA	0.0		
	6.5-7.5' bgs: SILT (100% silt), brown, moist, no odor, no sheen.						
10	7.5-11.0' bgs: SILT (100% silt), grey, moist, no odor, no sheen. Medium plasticity.						
		SM	100	NA	0.0		
	11.0-12.8' bgs: Silty SAND with gravel (65% sand, 20% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, dark-brown, moist, no odor, no sheen.	ML	100	NA	0.0	MW-32-13.5	
	12.8-13.2' bgs: SILT (100% silt), tan, moist, no odor, no sheen.	SP-SM					
15	13.2-13.6' bgs: Poorly graded SAND with silt (90% sand, 10% silt), fine to medium sand, tan, moist, no odor, no sheen.	ML					
		ML	100	NA	0.0		
	13.6-14.6' bgs: Sandy SILT (60% silt, 40% sand),fine sand, greenish-grey, moist, no odor, no sheen.						
	14.6-21.0' bgs: SILT (100% silt), tan, very moist, no odor, no sheen.		100	NA	0.0		
20	21.0-33.0' bgs: Well-graded GRAVEL (90% gravel, 5% silt, 5% sand), fine to coarse gravel, fine to coarse sand, brown, moist, no odor, no sheen. Subrounded gravel, and 4 to 6-inch subrounded grey cobbles.	GW	100	NA	0.0		
			100	NA	0.0	MW-32-23.0	
25			100	NA	0.0		



Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	313.14'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	312.99'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	35.0-45.0'	**Boring Abandonment:**	NA		**Y:** NA

FARALLON consulting
975 5th Avenue Northwest
Issaquah, Washington 98027

Log of Boring: MW-32

Client: Woodworth Capital, Inc.
Project: Lakeview Facility
Location: Lakewood, WA

Farallon PN: 188-002

Logged By: Ken Scott

Date/Time Started:	9/8/14 @ 0940	**Sampler Type:**	2.5' Poly Sac
Date/Time Completed:	9/8/14 @ 1125	**Drive Hammer (lbs.):**	NA
Equipment:	Terra Sonic	**Depth of Water ATD (ft bgs):**	38'
Drilling Company:	Holt Drilling	**Total Boring Depth (ft bgs):**	50.0
Drilling Foreman:	Brian Owen	**Total Well Depth (ft bgs):**	45.0
Drilling Method:	Sonic		

Depth (feet bgs.)	Sample Interval	Lithologic Description	USCS	USGS Graphic	% Recovery	Blow Counts 8/8/8	PID (ppm)	Sample ID	Sample Analyzed	Boring/Well Construction Details
30					100	NA	0.0			Bentonite Seal
					100	NA	0.0			
		33.0-35.4' bgs: Silty SAND with gravel (65% sand, 20% silt, 15% gravel), fine to coarse sand, fine to coarse gravel, tan, moist, no odor, no sheen.	SM		100	NA	0.0			Sand
35							0.0	MW-32-35.0		
		35.4-37.8' bgs: Well-graded GRAVEL with sand (75% gravel, 20% sand, 5% silt), fine to coarse gravel, fine to coarse sand, brown, moist, no odor, no sheen. Subrounded grey and black gravel. 4 to 6-inch subrounded grey cobbles 37 to 40-feet bgs.	GW		100	NA	0.0			
							0.0	MW-32-37.0	X	▽ Water Level
		37.8-50.0' bgs: Poorly graded SAND (90% sand, 5% silt, 5% gravel), fine to medium sand, fine to coarse gravel, brown, wet, no odor, no sheen.	SP		100	NA	0.0			
40										Screen
					100	NA	0.0			
					100	NA	0.0			
45							0.0	MW-32-45.0	X	End cap
					100	NA	0.0			
					100	NA	0.0			Bentonite Seal
50										
55										

Well Construction Information

Monument Type:	Flush Mount	**Filter Pack:**	2/12 sand	**Ground Surface Elevation (ft):**	313.14'
Casing Diameter (inches):	2"	**Surface Seal:**	Cement	**Top of Casing Elevation (ft):**	312.99'
Screen Slot Size (inches):	0.010	**Annular Seal:**	Bentonite	**Surveyed Location:**	**X:** NA
Screened Interval (ft bgs):	35.0-45.0'	**Boring Abandonment:**	NA		**Y:** NA