Groundwater Monitoring Report

RCRA Corrective Action Program
Boeing Renton Facility
Wood Project # PS20203450.2020 The Boeing Company

Prepared for:

The Boeing Company
Seattle, Washington

November 13, 2020

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Prepared by:

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November 13, 2020

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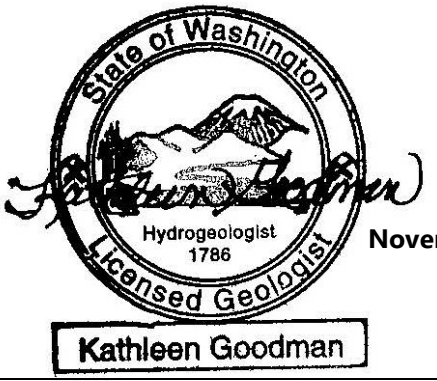
As approved by the Washington State Department of Ecology (Ecology) in a letter dated July 31, 2020, progress reporting is conducted on a semiannual basis in conjunction with monitoring, operations, and maintenance activities conducted pursuant to the Order and as outlined in the Engineering Design Report (AMEC, 2014).

Wood Environment & Infrastructure Solutions, Inc.



November 13, 2020

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1.0 Introduction

This report provides progress reporting in conformance with Section VII.B.1 of Agreed Order No. 8191 (Order) and summarizes cleanup actions and monitoring conducted at The Boeing Company (Boeing) Renton Facility (the Facility) during the dry season of 2020 (Figure 1). This work is required under the Resource Conservation and Recovery Act (RCRA) Corrective Action Program being performed at the Facility. Corrective action activities are performed for those solid waste management units (SWMUs), areas of concern (AOCs), and other areas where cleanup actions are ongoing. Monitoring, cleanup activities, and reporting are being conducted as part of the final remedy implementation described in the Engineering Design Report (EDR) (AMEC, 2014).

As approved by the Washington State Department of Ecology (Ecology) in a letter dated July 31, 2020, progress reporting is conducted on a semiannual basis in conjunction with monitoring, operations, and maintenance activities conducted pursuant to the Order and as outlined in the EDR.

The following documents summarize ongoing compliance activities conducted at the Facility:

- The original monitoring plan presented in Appendix D of the EDR (AMEC, 2014) was superseded by the Compliance Monitoring Plan (CMP) (Amec Foster Wheeler, 2016a), which was subsequently revised in the Addendum to the Compliance Monitoring Plan (CMP Addendum #1) (Amec Foster Wheeler, 2017).
- The groundwater monitoring program was further revised in the second Addendum to the Compliance Monitoring Plan (CMP Addendum #2) (Wood, 2019), which removed selected areas or wells from the sampling program. These changes were approved by Ecology.
- Boeing submitted a third Addendum to the Compliance Monitoring Plan (CMP Addendum #3) to Ecology on June 30, 2020 (CALIBRE, 2020). This addendum recommended further modifications to the groundwater monitoring program at the Facility and was approved by Ecology in July 2020.

Groundwater monitoring and cleanup actions are being conducted at the following areas (the ongoing remedies for each of these areas are noted in parentheses):

- SWMU-168: (monitored natural attenuation [MNA]);
- SWMU-172 and SWMU-174: (bioremediation, soil vapor extraction [SVE], and monitored attenuation [MA]);
- Building 4-78/79 SWMU/AOC Group: (bioremediation and MA; SVE has been discontinued, and Ecology approved the SVE system decommissioning in 2018);
- Former Fuel Farm AOC Group: (MNA);
- AOC-003: (bioremediation and MA);
- AOC-004: (bioremediation and MA);
- AOC-060: (bioremediation and MA);
- AOC-090: (bioremediation and MA); and
- Apron A: (bioremediation and MA).

The background and investigation history for each affected unit or group of units is described in the Cleanup Action Plan (CAP) (AMEC, 2012) and/or EDR (AMEC, 2014). This report includes results from monitoring for Apron A, as semiannual monitoring began in this area starting in the fourth quarter 2016 (Amec Foster Wheeler, 2016b).

The goals for cleanup of groundwater at the Facility, as described in the Cleanup Action Plan (CAP), include protection of groundwater for drinking water beneficial use at all areas of the site, and demonstration of protection of surface water beneficial uses at the conditional points of compliance (CPOCs) for each SWMU and AOC. Cleanup goals and comparison with specific criteria are discussed in this report for each SWMU and AOC. The protection of groundwater for beneficial uses, for each constituent of concern (COC), are based on site-specific cleanup levels (CULs) specified in the CAP. Ecology has made multiple clarifications and changes to MTCA since the draft CAP (AMEC 2012) was prepared that are relevant to the Facility CULs. Boeing is currently working with Ecology on proposed updates to the CULs based on Model Toxics Control Act (MTCA) criteria for potable water which are demonstrated to also be protective of other exposure pathways and applicable promulgated criteria (CALIBRE, 2019a) but these revisions have not been approved by Ecology. The measured COC concentrations in groundwater presented in this report are compared with the CULs specified in the CAP and are also compared to the MTCA criteria for potable water supply.

This semiannual report:

- Describes work completed during the reporting period;
- Describes any deviations from corrective action tasks required under the Order and/or CAP;
- Describes revisions to the corrective action schedule;
- Describes work projected to occur during the next half year sampling event, including any planned deviation from the CAP;
- Discusses remediation operation and maintenance activities conducted at the Facility during the reporting period;
- Documents monitoring activities conducted during the reporting period;
- Describes and discusses trends in monitoring data;
- Assesses remediation at each area; and
- Assesses attainment of CULs at the CPOCs.

This report presents information based on monitoring activities conducted during the dry season 2020 for the period from July through December 2020. In accordance with the requirements of the Order, corrective action activities were conducted at the Facility as described in this report.

1.1 Work completed in the dry season 2020

The following work was completed during the dry season 2020, the period from July through December 2020:

- Groundwater monitoring for the dry season 2020 was completed during August 2020.
- On behalf of Boeing, Wood submitted the second quarter 2020 report to Ecology on August 14, 2020.
- Recommendations for revisions to the compliance monitoring program were submitted to Ecology on June 30, 2020.
- Ecology's conditional approval to CMP Addendum #3 was received on July 31, 2020.

1.2 Deviations from required tasks

No deviations from tasks required in the Order occurred during this activity period.

1.3 Deviations from CAP

No deviations from the CAP occurred during this activity period. Modifications proposed in CMP Addendum #3 (CALIBRE, 2020), and approved by Ecology, have been incorporated into this sampling event, and are reported below.

1.4 Schedule revisions

Modifications to the schedule are presented in CMP Addendum #3, and these changes are summarized in Appendix A. The modifications in CMP Addendum #3 included a change from both quarterly and semiannual sampling to a sitewide semiannual program with sampling events to occur once each during the wet and dry seasons, in February and August, respectively. The revised monitoring schedule is detailed in Appendix A, Table A-1. This revised sampling schedule began in August 2020.

In 2021, the wet season report will be delivered to Ecology on or before May 30 and the dry season report will be delivered to Ecology on or before November 30.

1.5 Work projected for the next reporting period

The following work is projected for the 2021 wet season event:

- Reporting will be completed in accordance with the Order, CAP, EDR, and changes approved by Ecology, including those modifications proposed in CMP Addendum #3 (CALIBRE, 2020).
- Substrate injections to continue enhanced reductive dechlorination (ERD) treatment for bioremediation will occur in SWMU 172/174, the Building 4-78/79 SWMU/AOC Group, AOC-003, AOC-060, AOC-090, and Apron A.
- Soil with total petroleum hydrocarbons (TPH) exceeding CULs within unsaturated and smear zones is planned for excavation on the east side of Building 4-79. Groundwater elevations are currently being monitored to determine when water levels will be low enough to allow for sufficient excavations to occur in 2021.

2.0 Groundwater sampling methodology

Groundwater was sampled and analyzed as described in Appendix A. These procedures are in accordance with the methods specified in the CMP (Amec Foster Wheeler, 2016a) and CMP Addendum #3 (CALIBRE, 2020). Table A-1 summarizes the current groundwater monitoring program and constituents of concern (COCs) specified in the CAP and revised in CMP Addendum #1 (Amec Foster Wheeler, 2017), CMP Addendum #2 (Wood, 2019) and CMP Addendum #3 (CALIBRE, 2020) for all Facility corrective action areas. Table A-2 summarizes the current groundwater monitoring program for the corrective action areas that include MNA or MA as part of the cleanup remedy specified in the CAP. Tables A-1 and A-2 specify monitoring requirements for Apron A, which was not included in the CAP. Any changes or exceptions to the sampling or analytical methods cited in Appendix A during the event is described in the applicable subsections in Section 3. The field data sheets, which document the groundwater sample collection and field parameter monitoring for each well sampled during this event, are included in Appendix B.

The analytical methods, field duplicate, lab duplicate, and matrix spike/matrix spike duplicate frequencies are specified in the Quality Assurance Project Plan (Amec Foster Wheeler, 2016c). The full analytical reports provided by the laboratory are provided separately on compact disc. The data validation memoranda are included in Appendix C.

3.0 Corrective action activities completed during the reporting period

This section describes the corrective action activities conducted at the Facility during the dry season 2020. Operation of the SVE system at SWMU-172/174 continued during the dry season, as discussed in Section 3.2.1.2. Compliance monitoring was conducted in accordance with the CMP (Amec Foster Wheeler, 2016a) and CMP Addendum #3 (CALIBRE, 2020).

3.1 SWMU-168

This section describes corrective action activities conducted at this SWMU. Figure 2 shows the locations of the groundwater monitoring wells at SWMU-168, as well as the groundwater elevations measured during this monitoring event. The cleanup remedy for SWMU-168 is MNA; therefore, cleanup activities consist of monitoring only.

3.1.1 Cleanup action activities

No installation/construction activities were conducted for this cleanup action area during the dry season.

3.1.2 Compliance monitoring plan deviations

No deviations from the Compliance Monitoring Plan occurred for this area during the dry season. The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. CPOC area wells GW229S and GW231S have been removed from the monitoring plan in this area. Constituents of concern remained the same.

3.1.3 Water levels

Groundwater elevations measured during the dry season 2020 groundwater monitoring event at SWMU 168 are summarized in Table 1 and shown on Figure 2. Groundwater elevation contours are not shown since only one well is currently monitored in this group.

3.1.4 Groundwater monitoring results

Results for primary geochemical indicators are presented in Table 2; results for the SWMU-168 COCs are presented in Table 3; and COC results for sampling events in recent years are presented in Appendix D. Groundwater in this area is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A, which includes semiannual monitoring at the CPOC for both the area COCs and the primary geochemical indicators listed in Table A-2.

3.1.4.1 Natural attenuation/geochemical indicators

The geochemical indicator results are presented in Table 2. Data from the CPOC area well indicate that conditions are conducive to natural attenuation of vinyl chloride (VC) in this SWMU. The results for dissolved oxygen (DO) and oxidation reduction potential (ORP) measurements indicate reducing conditions. The pH value measured was near neutral.

3.1.4.2 COC results for source area

Groundwater samples were not collected from the source area well for SWMU-168, following the sampling schedule presented in Tables A-1 and A-2.

3.1.4.3 COC results for conditional point of compliance area

Monitoring results for the CPOC area monitoring well are shown in Table 3. The concentration of VC in the groundwater from CPOC well GW230I was above the CUL for VC at 0.162 microgram per liter (µg/L) but below the MTCA criteria for potable water supply. Historical trends for VC in GW230I are shown in Appendix D and depicted on Figure 3.

3.2 SWMU-172 and SWMU-174

This section describes corrective action activities conducted at these two SWMUs. The cleanup remedy for SWMU-172 and SWMU-174 is a combination of bioremediation, SVE, and MA. Figure 4 shows the layout of the groundwater monitoring wells and the remediation system for these SWMUs.

3.2.1 Cleanup action activities

3.2.1.1 Installation/construction activities

No installation/construction activities were conducted for these SWMUs during the dry season 2020.

3.2.1.2 Soil vapor extraction and bioremediation operations

The SVE system operated throughout the dry season in 2020. Details for system operations are included in the SVE operations and monitoring summary prepared by CALIBRE and included as Appendix E.

3.2.2 Compliance monitoring plan deviations

No deviations from the compliance monitoring plan occurred for this area during the dry season event. The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. Downgradient plume area well GW081S, and CPOC area well GW233I were removed from the monitoring plan under Addendum #3. Constituents of concern remained the same for SWMU-172 and SWMU-174.

3.2.3 Water levels

Groundwater elevations for the SWMU-172 and SWMU-174 area measured during the dry season event 2020 are summarized in Table 4 and shown on Figure 4. The contoured water level elevation data for August 2020 show that groundwater generally flows east from SWMU-172 and SWMU-174 toward the Cedar River Waterway, with an approximate hydraulic gradient of 0.015 foot/foot.

3.2.4 Groundwater monitoring results

Groundwater in this area is monitored following the schedules presented in Tables A-1 and A-2 in Appendix A. Results for primary geochemical indicators are presented in Table 5; results for the SWMU-172 and SWMU-174 area COCs are presented in Table 6.

3.2.4.1 Monitored attenuation/geochemical indicators

The geochemical indicator results are presented in Table 5. The pH measurements for all SWMU-172 and SWMU-174 monitoring wells were near neutral at greater than 6.0 standard units . The other natural attenuation parameter results indicate that geochemical conditions were generally uniform and reducing across this area. Reducing conditions indicate the dechlorination of volatile organic compounds are likely throughout this area. Total organic carbon (TOC) concentrations ranged from 0.89 milligrams per liter (mg/L) to 10.31 mg/L for all SWMU-172 and SWMU-174 monitoring wells.

3.2.4.2 COC results for source and downgradient plume areas

Table 6 lists dry season 2020 analytical results for the SWMU-172 and SWMU-174 COCs. Figures 5 and 6 show historical trend plots for tetrachloroethene (PCE), trichloroethene (TCE), vinyl chloride (VC), and cis 1,2 dichloroethene (cis-1,2-DCE) in source area wells GW152S and GW153S, and in downgradient plume area wells GW172S and GW173S. Flow generally moves from the vicinity of source area well GW152S to downgradient plume area well GW172S, and from source area well GW153S to downgradient plume area well GW173S. PCE and TCE are the chlorinated solvents that were used at the Facility, and cis-1,2-DCE and VC are breakdown products resulting from biodegradation processes.

As shown in Table 6, cis-1,2-DCE, TCE, PCE, and VC concentrations exceeded the CULs in the groundwater from source area well GW152S (and the associated duplicate sample). All other source area and downgradient plume area wells only had one or two analytes above respective CULs. As shown in Figures 5 through 7, the concentrations of COCs in groundwater from source area wells and downgradient plume area wells have generally remained stable or decreased over time. All cis-1,2-DCE, TCE, and PCE concentrations in groundwater from the source area and downgradient plume area wells meet the MTCA criteria for potable water supply; VC is close to the potable water criterion in GW152S at 0.284 µg/L (duplicate sample at 0.299 µg/L).

Arsenic was detected above the CUL in the groundwater from all source area and downgradient plume area wells. As shown in Figure 8, the arsenic concentrations in groundwater have generally remained stable in wells from both the source area and downgradient plume area based on the results from this dry season sampling event. The observed range of arsenic in groundwater is consistent with the naturally occurring background arsenic range reported by Ecology[1] (Ecology 2018) for Washington State. Ecology (2018) reported a naturally occurring background arsenic concentration of range of 2 to 8 µg/L in Washington.

Both copper and lead concentrations were above the CULs in source area well GW152S and its associated downgradient plume area well GW172S. Copper and lead were below CULs in all other source area and downgradient plume area wells. Metals concentrations were below the applicable MTCA criteria for potable water supply, except for arsenic in GW152S, GW172S, and GW173S.

3.2.4.3 COC results for conditional point of compliance area

Results from the CPOC area wells are presented in Table 6, and trend charts for cis-1,2-DCE, TCE, and VC for all CPOC area wells are presented in Figure 9. As shown in Table 6, cis-1,2-DCE was detected above the CUL in the groundwater from all CPOC area wells at concentrations ranging from 0.0881 to 0.482 µg/L; TCE was detected above the CUL in the groundwater from GW235I; and VC was detected above the CUL in the groundwater from GW232S. PCE was not detected in the groundwater from the CPOC wells and is not shown in Figure 9.

Arsenic was detected above the CUL in the groundwater from all CPOC area wells, except for GW235I; both copper and lead were detected above the CULs in the groundwater from CPOC area well GW236S; and lead was detected above the CUL in GW234S (Table 6). Figure 10 shows arsenic, copper, and lead concentration trends since the beginning of compliance monitoring in groundwater from the CPOC area wells. As shown in Figure 10, arsenic, copper, and lead concentrations have decreased over the last year of monitoring and have come back into the previously stable range for all CPOC area wells.

1. The 2018 Ecology background study is based on testing from over 2,500 supply wells used for potable supply in Puget Sound Basin. All samples are from water supply aquifers with no known anthropogenic impacts.

While select COC concentrations exceed the CULs in the groundwater from select CPOC wells, all of these COC concentrations were below the applicable MTCA criteria for potable water supply in the groundwater from all CPOC area wells, with the exceptions of arsenic in GW236S and vinyl chloride in GW232S.

3.3 Building 4-78/79 SWMU/AOC group

This section describes corrective action activities conducted at the Building 4-78/79 SWMU/AOC Group during the dry season 2020. The cleanup remedy for this SMWU/AOC group is bioremediation and MA; SVE has been discontinued and the system was decommissioned. Figure 11 shows the location of groundwater monitoring wells, bioremediation wells, and SVE wells for this area.

3.3.1 Cleanup action activities

3.3.1.1 Installation/construction activities

No installation/construction activities were conducted for this SWMU/AOC Group during the dry season 2020.

3.3.1.2 Soil vapor extraction and bioremediation operations

As previously reported during the 2018 monitoring events, the SVE system at the Building 4-78/79 SWMU/AOC Group was shut down during the first quarter of 2018, during which rebound testing was implemented. Soil samples were collected during the second quarter 2018 to assess the attainment of soil CULs, and results were reported in the second quarter monitoring report (Wood, 2018). The CULs were attained with one exception: the sample from 4.5 feet below ground surface at well PP13 had a concentration of TPH as gasoline (TPH-G) of 147 milligrams per kilogram (mg/kg), and the field duplicate was 131 mg/kg, above the CUL of 30 mg/kg.

A revised investigation work plan (CALIBRE, 2019b) to inform the scope of work for excavating the soils near PP13 and GW031S (shown in Figure 11) was submitted to Ecology on May 8, 2019, in response to a request from Ecology. The investigation described in the work plan was conducted on June 13 and 14, 2019, and the results were submitted to Ecology in November 2019 (CALIBRE 2019c). Groundwater elevations were monitored during subsequent monitoring events to determine the best time for soil removal activities. As documented in an email to Ecology dated October 22, 2019, the soil excavation work had not been completed because groundwater levels were not low enough before the start of the rainy season to schedule the work. TPH-G concentrations in groundwater continue to be monitored. The workplan for soil excavation of the Building 4-78/79 hydrocarbon source area is currently in preparation with an anticipated excavation start date in the third quarter of 2021.

No new nitrate/sulfate injections have been completed since January 2020. Sampling occurred in February 2020. Trend charts for cis-1,2-DCE and benzene in the injection wells are presented in Figure 12, and charts for TCE and VC in the injection wells are presented in Figure 13.

3.3.2 Compliance monitoring plan deviations

No deviations from the compliance monitoring plan occurred for this area during the dry season event. The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. Source area wells GW039S and GW243I; downgradient plume area wells GW038S, GW209S, and GW210S; and CPOC area wells GW238I, GW239I, GW241S, and GW242I were removed from the monitoring plan for this SWMU/AOC group. Constituents of concern remained the same for this group.

3.3.3 Water levels

Table 7 presents the groundwater elevations measured during the dry season groundwater monitoring event at the Building 4-78/79 SWMU/AOC group. As shown in Figure 11, the observed direction of groundwater flow from the source area during August 2020 is generally to the southeast, with a hydraulic gradient of 0.004 foot/foot.

3.3.4 Groundwater monitoring results

Results for primary geochemical indicators are presented in Table 8; results for the COCs for the Building 4-78/79 SWMU/AOC Group are presented in Table 9. Groundwater at this area is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A.

3.3.4.1 Natural attenuation/geochemical indicators

The geochemical indicator results are presented in Table 8. In general, source area, downgradient, and CPOC area wells had low levels of dissolved oxygen. The pH was near neutral in all wells, and just below 6.0 standards units in GW240D. The source area wells showed reducing conditions with low dissolved oxygen and negative ORP readings. Results for the other primary geochemical indicators were generally consistent in all wells. TOC concentrations in source area wells ranged from 6.46 to 13.30 mg/L.

3.3.4.2 COC results for source area

Table 9 lists analytical results for COCs during the dry season event at the Building 4-78/79 SWMU/AOC Group. The CULs established in the CAP for the CPOC are also presented on Table 9. Figures 14 and 15 are trend charts showing historical trends for COCs for the source area wells.

As shown in Table 9, benzene, cis-1,2-DCE, TCE, and VC were detected above the respective CULs in groundwater from GW033S, and TPH-G was detected below the CUL. In source area well GW031S (and the duplicate sample) benzene, VC, and TPH-G were detected above the CULs. The CUL for VC was also exceeded in GW034S and GW244S, and for cis-1,2-DCE in GW244S.

Figure 14 shows trends for volatile organic compounds (VOCs) in source area wells GW031S and GW033S. COCs shown for GW031S appear to be generally stable with greater annual fluctuations in benzene. Trends in GW033S appear to show greater fluctuation, with cis-1,2-DCE and VC results increasing over the past six monitoring events. However, concentrations are still below the highest levels recorded during 2017 events, since monitoring began. Figure 15 shows trends for VOCs in source area wells GW034S and GW244S. Concentrations of COCs in GW034S appear generally stable, with all COCs below laboratory detection limits for the past seven monitoring events, except for VC. COC concentrations in GW244S have generally trended down since monitoring began.

Concentrations of COCs in the groundwater from select source area wells remain above the MTCA criteria for potable water supply (specifically benzene, cis-1,2-DCE, VC, and TPH-G). Active treatment is ongoing.

3.3.4.3 COC results for conditional point of compliance area

Groundwater monitoring results in the CPOC area for the dry season 2020 are summarized in Table 9. Trends for CPOC wells GW143S, GW237S, and GW240D are shown in Figures 16 through 18. Benzene, TCE, VC, and TPH-G were not detected in groundwater from the CPOC area wells at concentrations above the CULs. Cis-1,2-DCE was detected above the CUL in groundwater from GW143S. As shown in Figure 16, benzene has been sporadically detected in the groundwater from CPOC area well GW237S but has not been detected above the CUL in the groundwater from any of the other CPOC wells. The benzene concentration in the groundwater from CPOC well GW237S was below the CUL during this dry season event. Cis-1,2-DCE

has been detected sporadically in groundwater from CPOC area well GW143S (above the CUL in this sampling event) but has not been detected above the CUL in the groundwater from any of the other CPOC wells (Figure 16). For the CPOC area wells, all COCs were below the MTCA criteria for potable water supply.

3.4 Former Fuel Farm AOC group

This section describes corrective action activities conducted at the Former Fuel Farm AOC group during the dry season 2020. The final remedy for the Former Fuel Farm is MNA.

3.4.1 Cleanup action activities

No installation/construction activities were conducted for this cleanup action area during the dry season 2020.

3.4.2 Compliance monitoring plan deviations

No deviations from the compliance monitoring plan occurred for this area during the dry season. The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. source area well GW255S, and CPOC area wells GW183S, GW184S, GW212S, GW256S, GW257S, GW258S were removed from the monitoring program for this group. Constituents of concern remained the same for this group.

3.4.3 Water levels

Groundwater elevations for the Former Fuel Farm AOC Group measured during the dry season event are summarized in Table 10 and shown on Figure 19. Groundwater elevation contours are not shown since only three wells are monitored in this group and data is too limited to produce accurate contours. Groundwater flow direction is shown based on historical information from this AOC and is to the northeast.

3.4.4 Groundwater monitoring results

Results for primary geochemical indicators are presented in Table 11; results for COCs for the Former Fuel Farm AOC Group are presented in Table 12. Groundwater in this area is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A.

3.4.4.1 Monitored natural attenuation indicators

The geochemical indicator results are presented in Table 11. Results in Table 11 indicate that geochemical conditions are generally consistent throughout the Former Fuel Farm AOC Group. The pH in CPOC area wells was within 0.2 standard units of 6.0. Dissolved oxygen was generally low across wells in this area, and ORP was moderate for groundwater. The geochemical indicators indicate that conditions are generally conducive to natural attenuation of the COCs for the Former Fuel Farm AOC Group.

3.4.4.2 COC results for source area

The single source area well for this group was removed from the monitoring plan with the acceptance of CMP Addendum #3.

3.4.4.3 COC results for conditional point of compliance area

CPOC area monitoring results are presented in Table 12. Figure 20 shows trend data for CPOC area wells GW211S, GW221S, and GW224S. Figure 20 shows that the dry season event results for these wells are consistent with the historical monitoring results since late 2013, except for GW221S where concentrations of both TPH-D and Jet-A fuel have increased during the last two monitoring events.

Samples were analyzed for TPH in the diesel, motor oil, and Jet A ranges. TPH-D and Jet-A were detected above the CUL in GW221S and GW224S. Motor oil was not detected in any of the CPOC area wells.

3.5 AOC-001 and AOC-002

Apron R near AOC-001 and AOC-002 is under reconstruction. Therefore, no monitoring was conducted for this area during the dry season 2020. Monitoring wells in these areas were removed on November 25, 2019. Monitoring wells are planned to be reinstalled when construction is complete, currently anticipated for late 2022.

3.6 AOC-003

This section describes corrective action activities conducted at AOC-003 for the dry season event. The cleanup remedy for this AOC is bioremediation and MA. Figure 21 shows the location of groundwater monitoring and bioremediation wells at AOC-003, as well as the groundwater elevations measured during this monitoring event.

3.6.1 Cleanup action activities

No installation/construction activities were conducted for this cleanup action area during the dry season event.

3.6.2 Compliance monitoring plan deviations

Groundwater samples for AOC-003 normally have TOC analyzed; however, a communication error between the planning and sampling team prevented the analysis of TOC during the dry season event. The constituents of concern monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. PCE, TCE, and cis-1,2-DCE were removed as COCs. Wells in the monitoring program remained the same for this AOC.

3.6.3 Water levels

Table 13 presents the groundwater elevations measured during the dry season event at AOC-003. Figure 21 shows the groundwater elevations from this event. Groundwater flow directions cannot be determined from the available groundwater elevation data.

3.6.4 Groundwater monitoring results

Groundwater at AOC-003 is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A. Results for geochemical indicators are presented in Table 14; results for the AOC-003 COCs are presented in Table 15.

3.6.4.1 Monitored attenuation/geochemical indicators

The geochemical indicator results are presented in Table 14. Results in Table 14 indicate that geochemical conditions are generally consistent throughout this AOC. pH readings were near neutral for all wells in this area. Low DO and low to negative ORP readings were observed during this monitoring event, indicating reducing conditions.

3.6.4.2 COC results for source and downgradient plume areas

Wells in this group were analyzed for VC. Both source area and downgradient plume area wells were above the CUL and both wells (GW249S and GW188S) are also above the MTCA criteria for potable water. Figure 22 shows the historical trends of VC in GW249S and GW188S.

3.6.4.3 COC results for conditional point of compliance area

VC was analyzed at CPOC area wells and was detected at concentrations above the CULs in the groundwater from both CPOC wells (GW247S and GW248I), at concentrations of 0.392 and 0.383 µg/L, respectively. Both wells are also above the MTCA criteria for potable water. Figure 23 shows the historical trends of VC in GW247S and GW248I.

3.7 AOC-004

This section describes corrective action activities conducted at AOC-004 for the dry season event. The cleanup remedy for this AOC is bioremediation and MA. Figure 24 shows the location of groundwater monitoring and bioremediation wells at AOC-004, as well as the groundwater elevations measured during this monitoring event.

3.7.1 Cleanup action activities

No installation/construction activities were conducted for this cleanup action area during the dry season event.

3.7.2 Compliance monitoring plan deviations

The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. CPOC area well GW174S was removed from the monitoring program for AOC-004. COCs remained the same.

3.7.3 Water levels

Table 16 presents the groundwater elevation measured during the dry season event at AOC-004. Figure 24 shows the groundwater elevation from this event. Groundwater flow directions cannot be determined from the available groundwater elevation data.

3.7.4 Groundwater monitoring results

Groundwater at AOC-004 is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A. Results for geochemical indicators are presented in Table 17; results for the AOC-004 COCs are presented in Table 18.

3.7.4.1 Monitored attenuation/geochemical indicators

The geochemical indicator results are presented in Table 17. The pH reading was near neutral for the well in this area. Low DO and moderate ORP readings were observed during this monitoring event.

3.7.4.2 COC results for source area

The well in this group was analyzed for lead. The groundwater in the source area well was below the CUL for lead and also below the MTCA criteria for potable water supply. Figure 25 shows the historical trend for lead in GW250S.

3.8 AOC-060

This section describes corrective action activities conducted at AOC-060 for the dry season event. The cleanup remedy for this AOC is bioremediation and MA. Figure 26 shows the location of groundwater monitoring and bioremediation wells at AOC-060, as well as the groundwater elevations measured during this monitoring event.

3.8.1 Cleanup action activities

No installation/construction activities were conducted for this cleanup action area during the dry season event.

3.8.2 Compliance monitoring plan deviations

The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. GW149S, GW252S, and GW254S were removed from the monitoring program. COCs in the monitoring group remained the same.

3.8.3 Water levels

Table 19 presents the groundwater elevations measured during the dry season event at AOC-060. Figure 26 shows the groundwater elevations from this event. Determined from historical monitoring events, groundwater flow direction is generally to the west-southwest, toward the Cedar River Waterway. Groundwater contours are not shown due to few wells showing variation of hydraulic gradient across the site.

3.8.4 Groundwater monitoring results

Groundwater at AOC-060 is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A. Results for geochemical indicators are presented in Table 20; results for the AOC-060 COCs are presented in Table 21.

3.8.4.1 Monitored attenuation/geochemical indicators

The geochemical indicator results are presented in Table 20. Results in Table 20 indicate that geochemical conditions are relatively consistent throughout this AOC. The pH was near neutral in this AOC, with two wells below 6.0 standard units, and all other wells between 6.0 to 6.5 standard units. Low DO and low to negative ORP readings were observed during this monitoring event, indicating reducing conditions. Wells in AOC-060 had TOC results ranging from 2.76 mg/L to 8.70 mg/L.

3.8.4.2 COC results for source and downgradient plume areas

Wells in this group were analyzed for cis-1,2-DCE, TCE, and VC (Table 21). Groundwater from all source area and downgradient plume area wells exceeded the CUL for cis-1,2-DCE, but all were below the MTCA criteria for potable water supply. Source area well GW009S also exceeded the CUL for TCE but was also below the MTCA criteria for potable water supply. Figure 27 shows historical trends for COCs in GW009S, which have been stable since monitoring began. TCE was not detected in downgradient plume area well GW014S (or its duplicate) but exceeded the CUL in groundwater from GW012S and GW147S. VC was below the CUL in all wells, except GW 012S, this single analyte (VC) in this one well exceeded the MTCA criteria for potable water supply. Figures 27 and 28 show historical trends for COCs in downgradient plume area wells. COC results in GW014S have been generally stable since monitoring began, but GW012S and GW147S exhibit more fluctuation in COC concentrations, possibly due to seasonal groundwater flow variations.

All groundwater samples in the source and downgradient plume areas meet the MTCA criteria for potable water supply, except VC in GW012S.

3.8.4.3 COC results for conditional point of compliance area

Both samples from CPOC area wells, GW150S and GW253I, exceeded the CULs for cis-1,2-DCE and TCE and were below the CUL for VC. Figure 29 shows historical trends of COCs in CPOC area wells GW150S and GW253I. All results from the CPOC area wells meet the MTCA criteria for potable water supply.

3.9 AOC-090

This section describes corrective action activities conducted at AOC-090 for the dry season event. The cleanup remedy for this AOC is bioremediation and MA. Figure 30 shows the location of groundwater monitoring and bioremediation wells at AOC-090, as well as the groundwater elevations measured during this monitoring event.

3.9.1 Cleanup action activities

No installation/construction activities were conducted for this cleanup action area during the dry season event.

3.9.2 Compliance monitoring plan deviations

The wells and COCs monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. Wells GW163I, GW165I, GW175I, GW177I, GW179I, and GW180S were removed from the monitoring program. Analytes were reduced to chlorinated volatile organic compounds (CVOCs) and TPH in GW189S, and VC in the remaining wells. Normally GW189S would be analyzed for TOC, however, a communication error between the planning and sampling team prevented the analysis of TOC during this dry season event.

3.9.3 Water levels

Table 22 presents the groundwater elevations measured during the dry season event at AOC-090. Figure 30 shows the groundwater elevations from this event. Determined from historical monitoring events, groundwater flow direction is generally to the west-southwest, toward the Cedar River Waterway. Groundwater contours are not shown due to anomalous groundwater elevation readings.

3.9.4 Groundwater monitoring results

Groundwater at AOC-090 is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A. Results for geochemical indicators are presented in Table 23; results for the AOC-090 COCs are presented in Table 24.

3.9.4.1 Monitored attenuation/geochemical indicators

The geochemical indicator results are presented in Table 23. Results in Table 23 indicate that geochemical conditions are consistent throughout this AOC. Temperature in this group is lower than the other AOCs. The pH was just below neutral in this AOC, with a range of 5.99 to 6.17 standard units. Low DO and moderate ORP readings were observed during this monitoring event, indicating reducing conditions.

3.9.4.2 COC results for source and downgradient plume areas

Groundwater from source area well GW189S exceeds the CUL for VC and TCE; all other CVOCs and TPH results were below CULs, the measured TCE level is below the MTCA criteria for potable water supply and VC is above it. Historical trends for GW189S are shown in Figure 31. Downgradient plume area well GW176S exceeded the CUL for VC and also exceeds the MTCA criteria for potable water supply.

Both groundwater samples from the source area and downgradient plume area exceed the CUL and MTCA standards for potable water supply for VC at 0.369 µg/L in GW189S and 0.232 µg/L in GW176S.

3.9.4.3 COC results for conditional point of compliance area

All samples from CPOC area wells exceeded the CUL for VC. Groundwater results from the CPOC area wells GW207S and GW208S exceed the MTCA standard for potable water supply for VC.

3.10 Building 4-70 area

The Building 4-70 Area was removed from the monitoring program with the acceptance of CMP Addendum #3.

3.11 Lot 20/Former Building 10-71 Parcel

The Lot 20/Former Building 10-71 Parcel was removed from the monitoring program with the acceptance of CMP Addendum #3.

3.12 Apron A area

This section describes corrective action activities conducted at the Apron A area during the dry season event. The cleanup remedy proposed for the Apron A area is bioremediation and MA. Figure 32 shows the locations of the groundwater monitoring wells in the Apron A area.

3.12.1 Cleanup action activities

No construction or operations work was conducted in the Apron A area during the dry season event.

3.12.2 Compliance monitoring plan deviations

The wells monitored in this group changed with the acceptance of CMP Addendum #3 by Ecology. Well GW262S was removed from the monitoring program for this area. COCs monitored for this group remained the same.

3.12.3 Water levels

The depth to groundwater measurements during the dry season at Apron A are presented in Table 25 and on Figure 32. Groundwater elevations are not available because the top of casing elevations were never surveyed. Groundwater flow direction is estimated based on historical information of the area.

3.12.4 Groundwater monitoring results

Results for primary geochemical indicators for groundwater from groundwater monitoring well GW264S are presented in Table 26; results for COCs from this well are presented in Table 27. Groundwater in this area is monitored following the schedule presented in Tables A-1 and A-2 in Appendix A.

3.12.4.1 Monitored attenuation/geochemical indicators

Geochemical parameters are presented in Table 26. The TOC concentration in GW264S was elevated during the dry season event. The pH reading was slightly acidic at 5.96 standard units. Dissolved oxygen and ORP were conducive to a reducing environment for dechlorination of volatile organic compounds.

3.12.4.2 COC results

Apron A COCs (cis-1,2-DCE and VC) for GW264S are presented in Table 27. VC was not detected in the groundwater from GW264S. Cis-1,2-DCE was detected in the groundwater from monitoring well GW264S at a concentration of 0.52 µg/L, which is below the applicable MTCA criterion for potable water supply.

4.0 References

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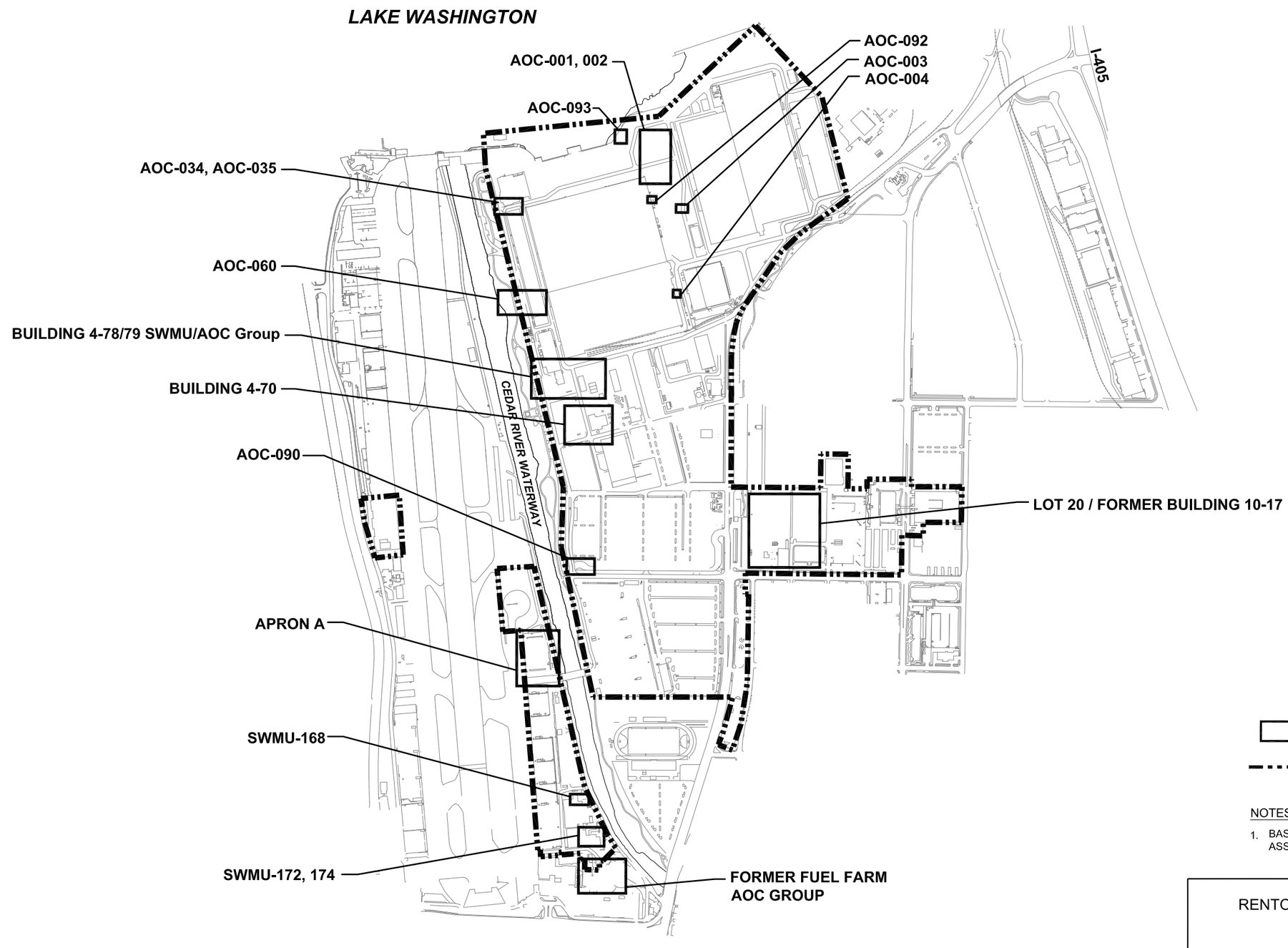
———, 2019, Addendum to the Compliance Monitoring Plan (CMP Addendum #2), Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, April.

Figures



LEGEND

GENERAL LOCATION OF SWMUs AND AOCs

FACILITY BOUNDARY

NOTES

1. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES INC., DECEMBER, 1994

0 400 800

APPROXIMATE SCALE IN FEET

BOEING

RENTON SWMU AND AOC LOCATIONS

Boeing Renton Facility
Renton, Washington

By: APS	Date: 06/30/20	Project No. PS20203450
wood.		Figure 1

Plot Date: 06/30/20 - 8:37am, Plotted by: adam.stenberg
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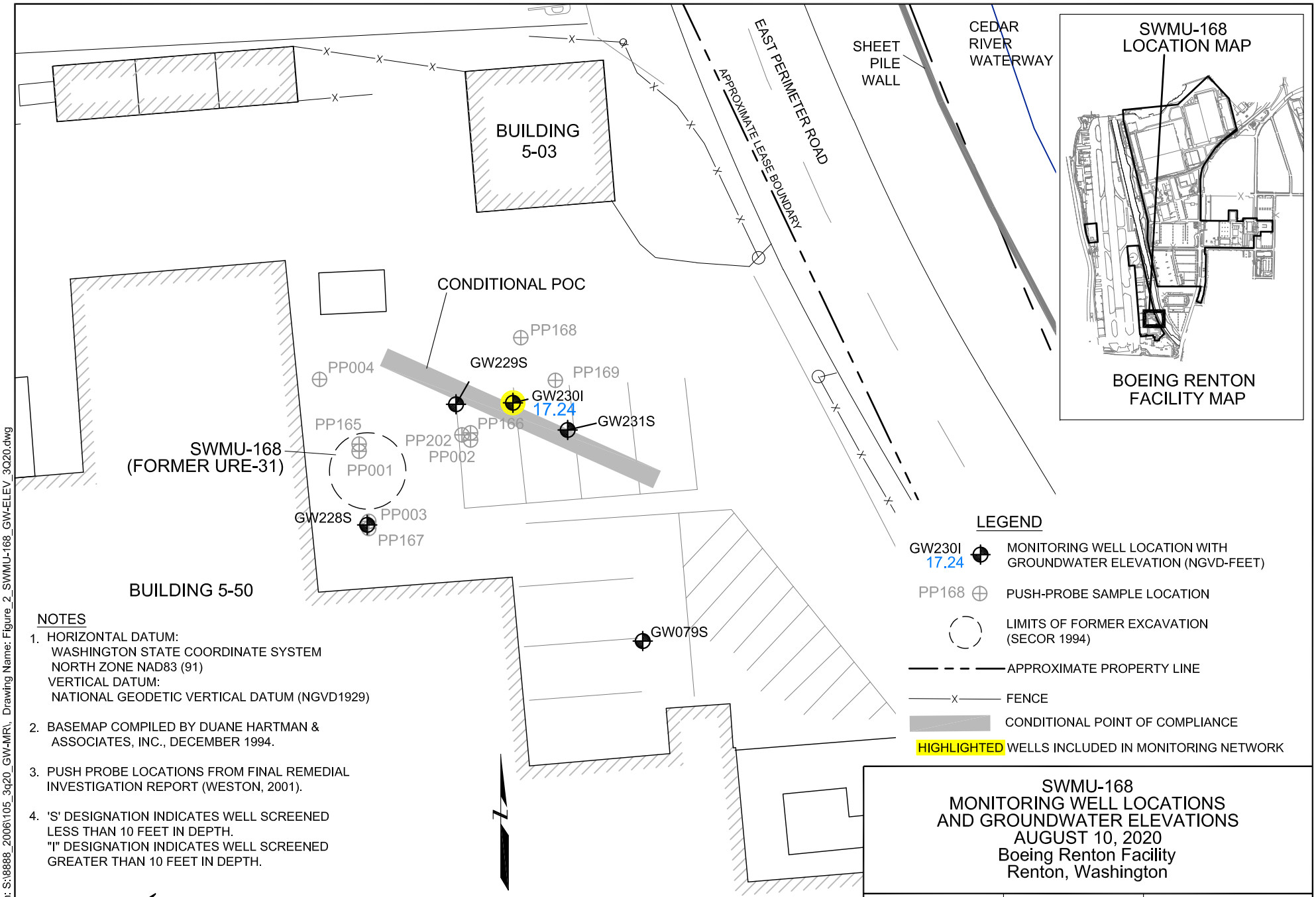

NOTES

1. HORIZONTAL DATUM:
   WASHINGTON STATE COORDINATE SYSTEM
   NORTH ZONE NAD83 (91)
   VERTICAL DATUM:
   NATIONAL GEODETIC VERTICAL DATUM (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994.
3. PUSH PROBE LOCATIONS FROM FINAL REMEDIAL INVESTIGATION REPORT (WESTON, 2001).
4. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 10 FEET IN DEPTH.
   "I" DESIGNATION INDICATES WELL SCREENED GREATER THAN 10 FEET IN DEPTH.

BOEING

SWMU-168
MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS
AUGUST 10, 2020
Boeing Renton Facility
Renton, Washington

By: APS	Date: 10/29/20	Project No. PS20203450
wood.	Figure	2

Plot Date: 10/29/20 - 10:58am, Plotted by: adam.stenberg
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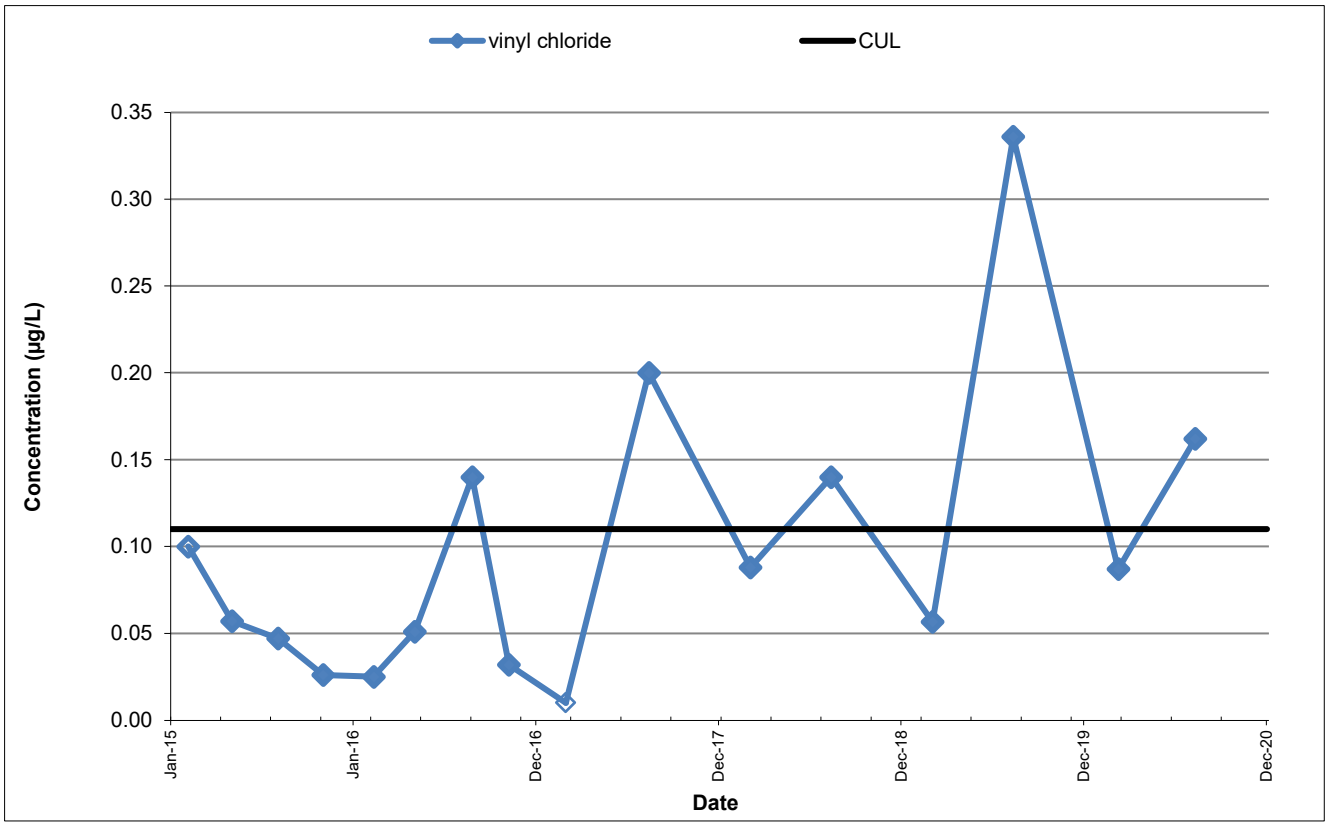
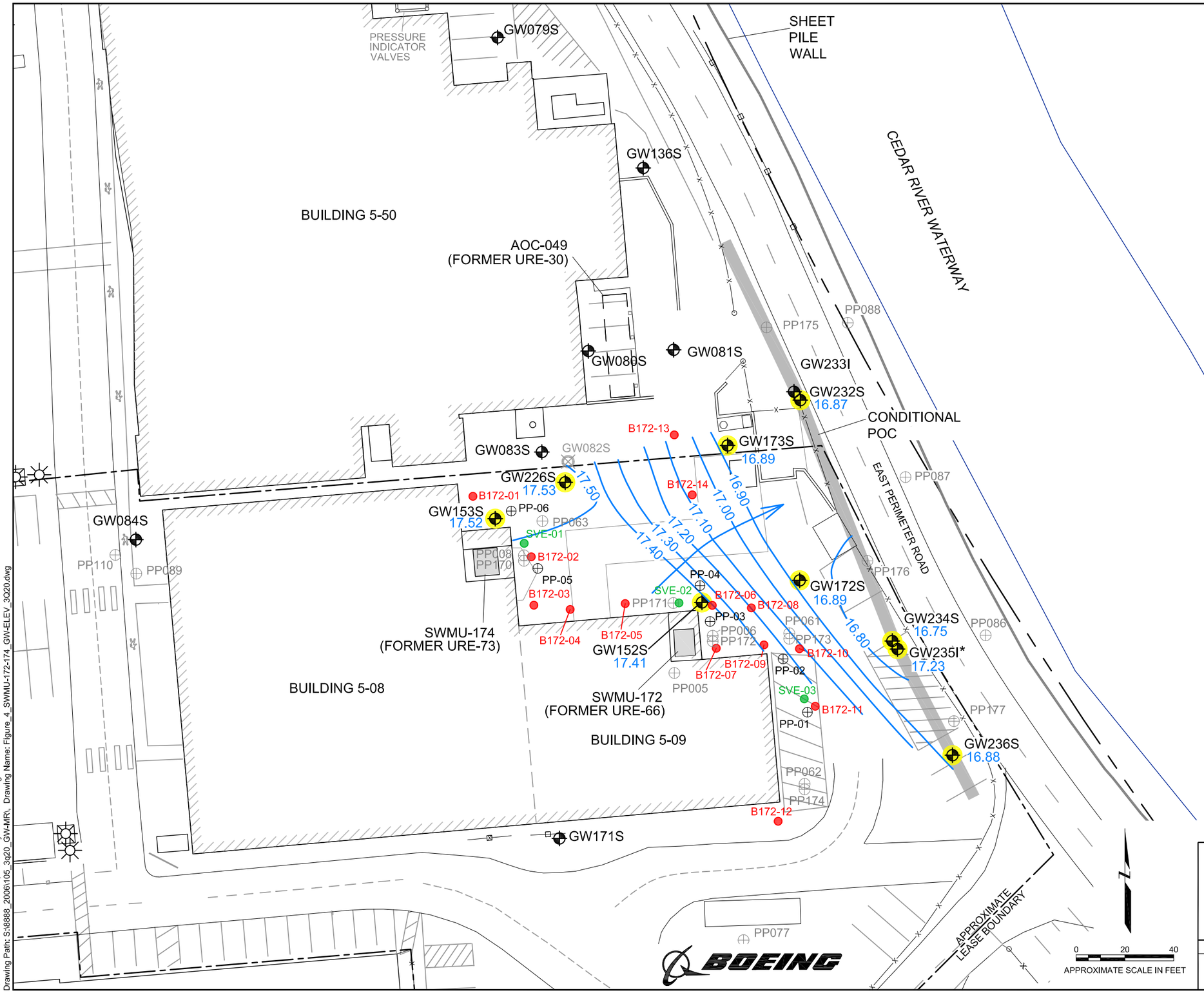


Note: non-detected values shown at one-half the reporting limit.

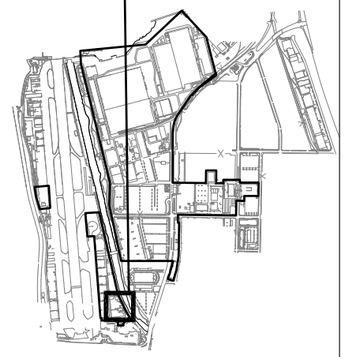
CPOC AREA WELL GW230I

wood.	SWMU-168 HISTORICAL VC TREND PLOT FOR CPOC WELL GW230I Boeing Renton Facility Renton, Washington	Project No. 8888 Figure **3**

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 3_SWMU 168.xls



SWMU-172 AND SWMU-174 LOCATION MAP



BOEING RENTON FACILITY MAP

LEGEND

- GW172S 16.89 — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION (NGVD-FEET)
- * — WELL SCREENED IN UPPER AND LOWER PORTION OF AQUIFER, SO WATER LEVEL IS NOT USED FOR CONTOURING.
- 16.90 — GROUNDWATER ELEVATION CONTOUR (IN FEET) (DASHED WHERE INFERRED)
- GENERAL DIRECTION OF GROUNDWATER FLOW
- GW082S — ABANDONED MONITORING WELL
- APPROXIMATE PROPERTY LINE
- FENCE
- CONDITIONAL POINT OF COMPLIANCE
- HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK
- SVE-02 — SVE WELL
- B172-10 — BIOREMEDIATION INJECTION WELL
- PP171 — PUSH PROBE SAMPLING LOCATION
- PP-01 — PUSH PROBE SAMPLE LOCATION COMPLETED IN JUNE 2018

NOTES

1. HORIZONTAL DATUM: WASHINGTON STATE COORDINATE SYSTEM NORTH ZONE NAD83 (91)
   VERTICAL DATUM: NATIONAL GEODETIC VERTICAL DATUM (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994.
3. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 20 FEET IN DEPTH.
   'I' DESIGNATION INDICATES WELL SCREENED GREATER THAN 20 FEET IN DEPTH.

SWMU-172 AND SWMU-174 MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS AUGUST 10, 2020 Boeing Renton Facility Renton, Washington

By: APS	Date: 10/29/20	Project No. PS20203450
wood.		Figure 4

Plot Date: 10/29/20 - 11:00am Plotted by: adam.stenberg
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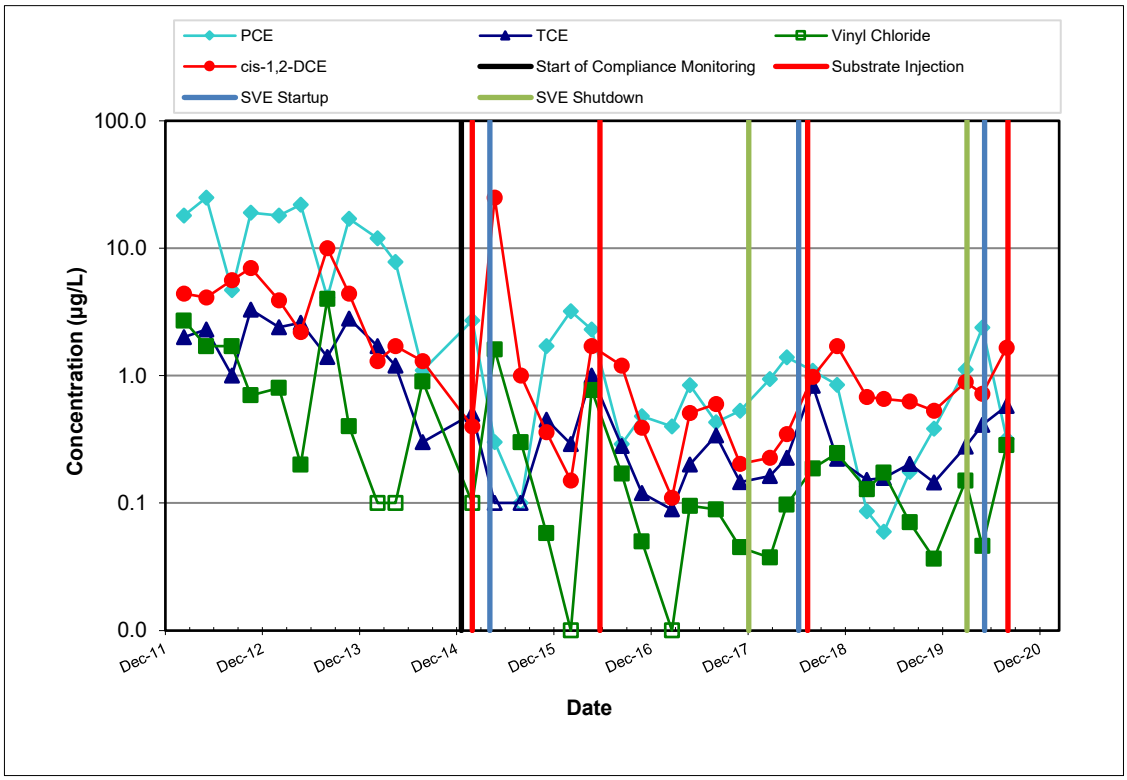
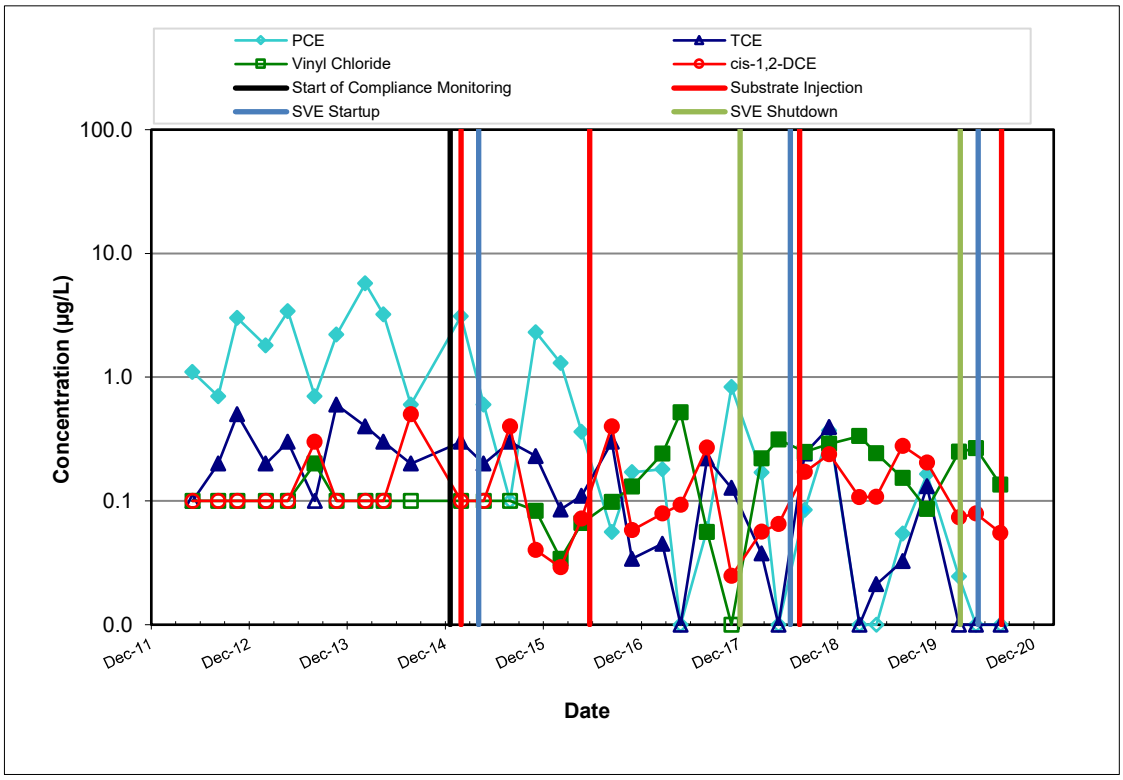


SOURCE AREA WELL GW152S

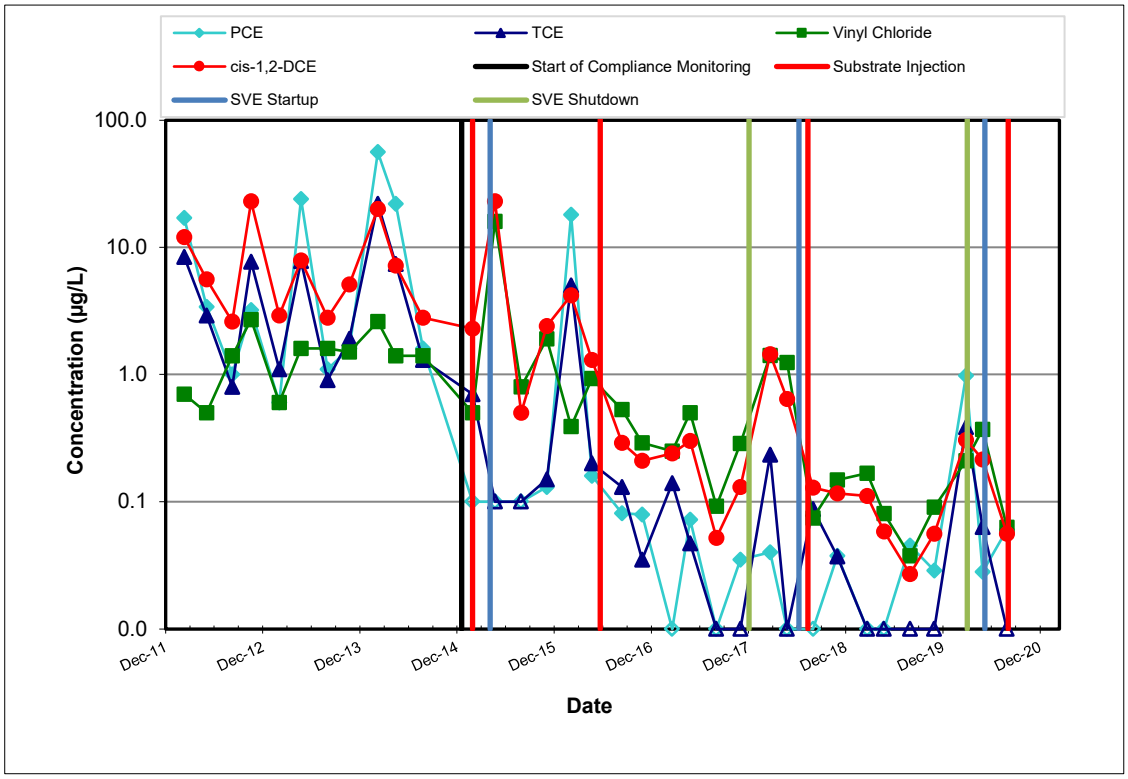


SOURCE AREA WELL GW153S

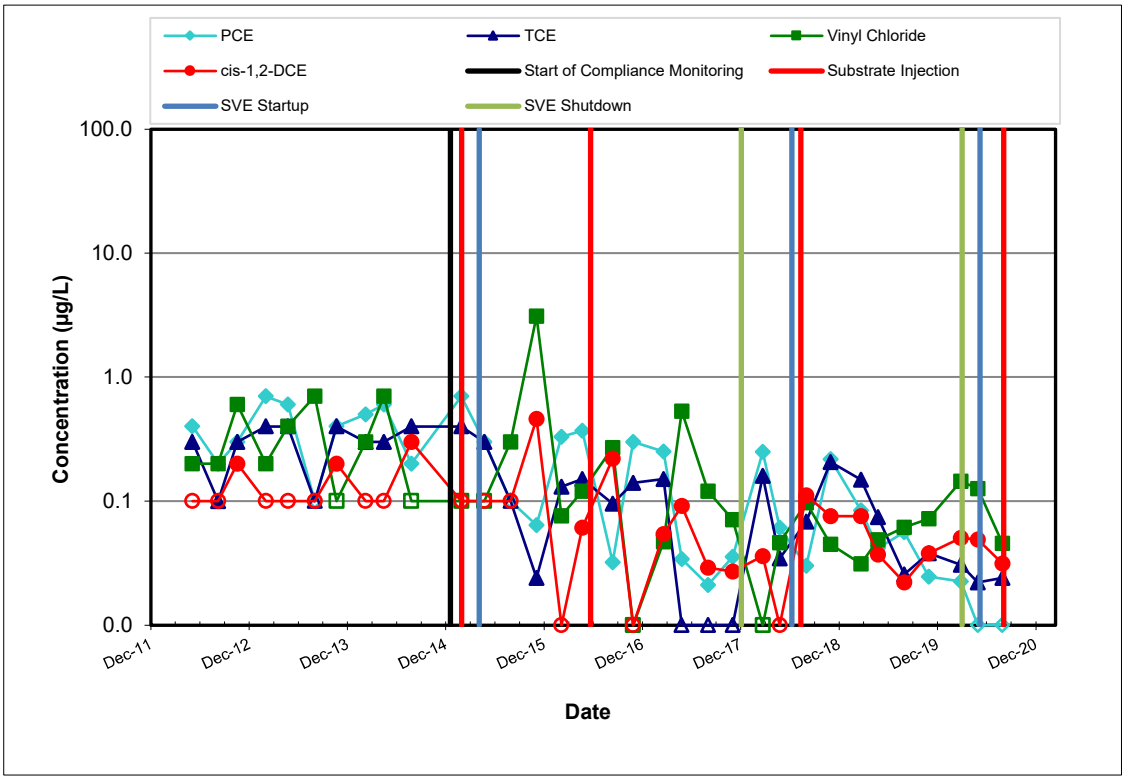
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	SWMU-172 AND SWMU-174 TREND PLOTS FOR SOURCE AREA WELLS GW152S AND GW153S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 5

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 5 to 10_ SWMU_172-174.xlsx



DOWNGRADIENT PLUME AREA WELL GW172S

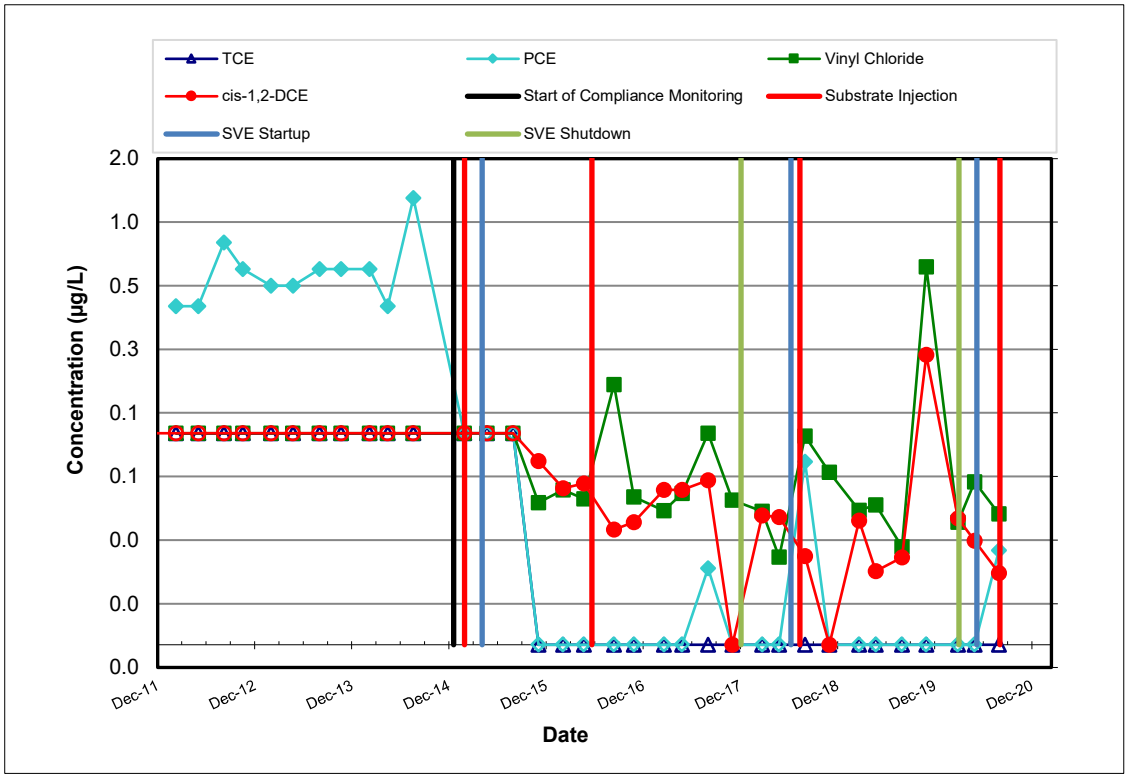


DOWNGRADIENT PLUME AREA WELL GW173S

Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	SWMU-172 AND SWMU-174 TREND PLOTS FOR DOWNGRADIENT PLUME AREA WELLS GW172S AND GW173S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 6

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 5 to 10_ SWMU_172-174.xlsx

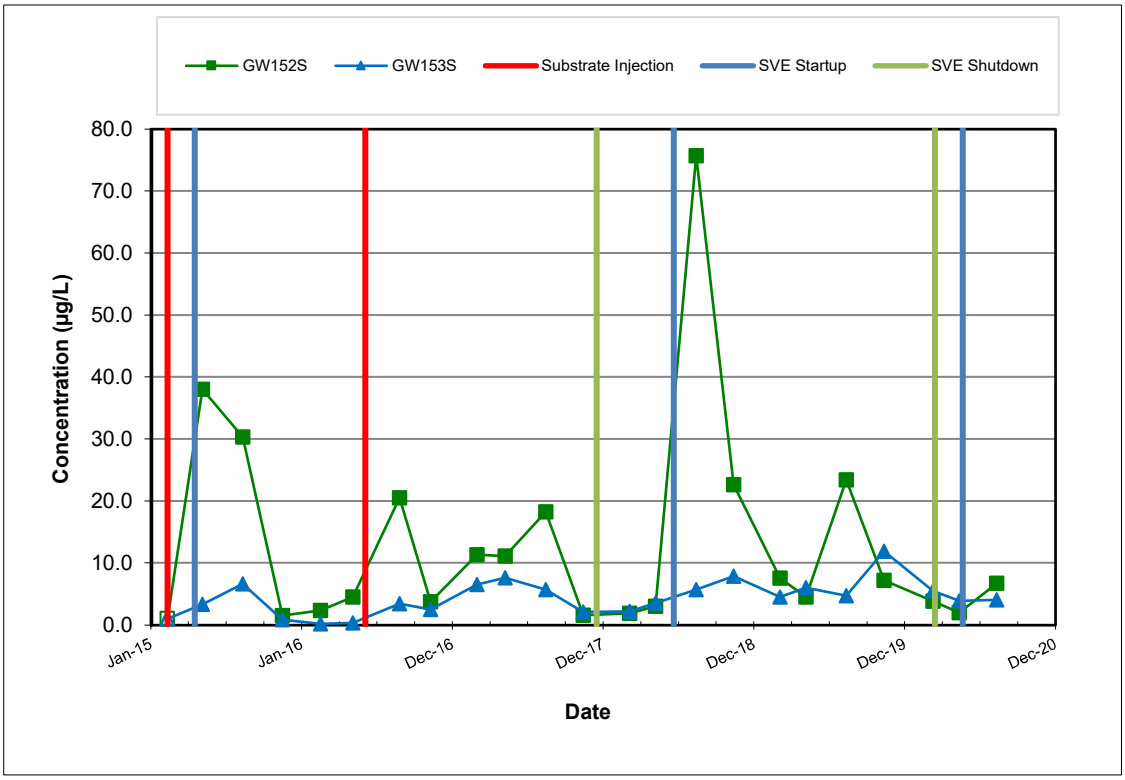


Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

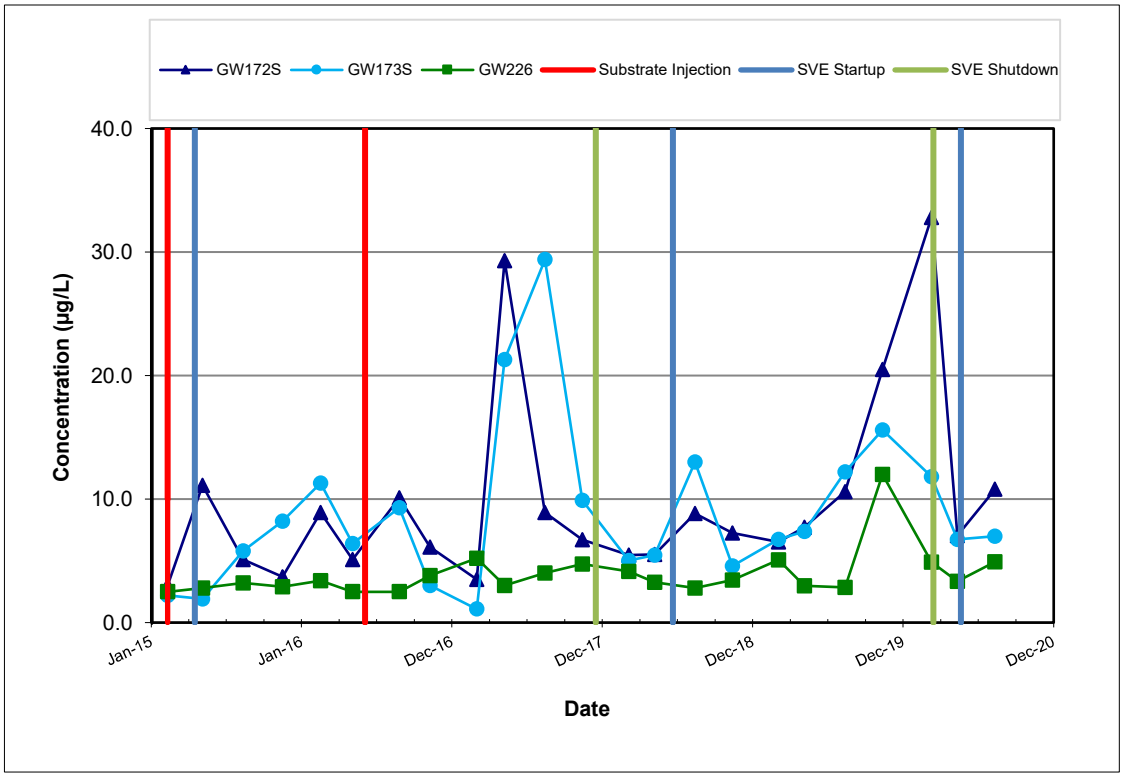
DOWNGRADIENT PLUME AREA WELL GW226S

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 5 to 10_ SWMU_172-174.xlsx

wood.	SWMU-172 AND SWMU-174 TREND PLOTS FOR DOWNGRADIENT PLUME AREA WELL GW226S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 7



TOTAL ARSENIC IN SOURCE AREA WELLS

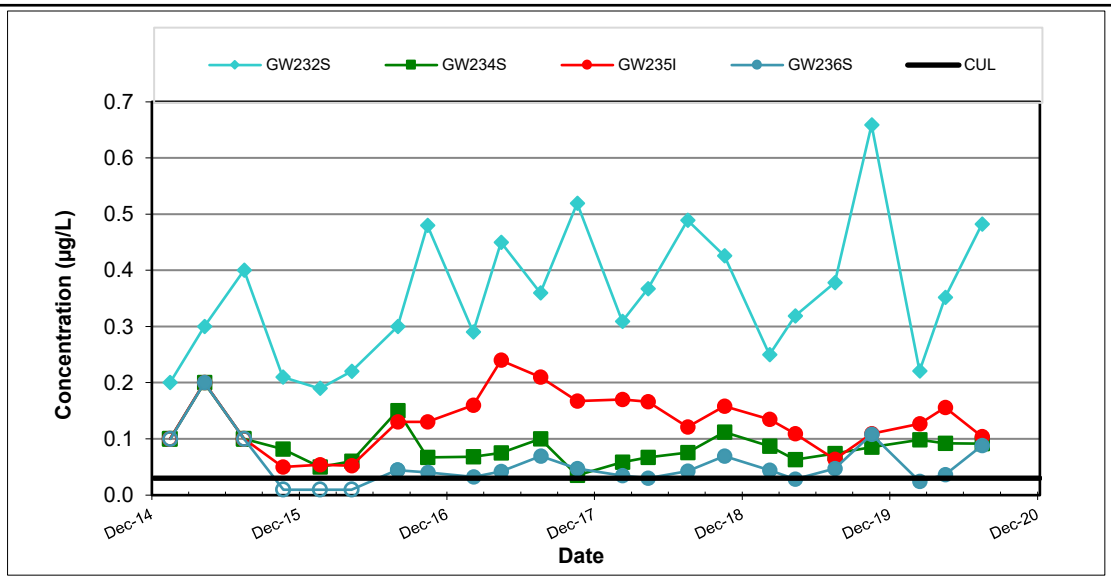


TOTAL ARSENIC IN DOWNGRADIENT PLUME AREA WELLS

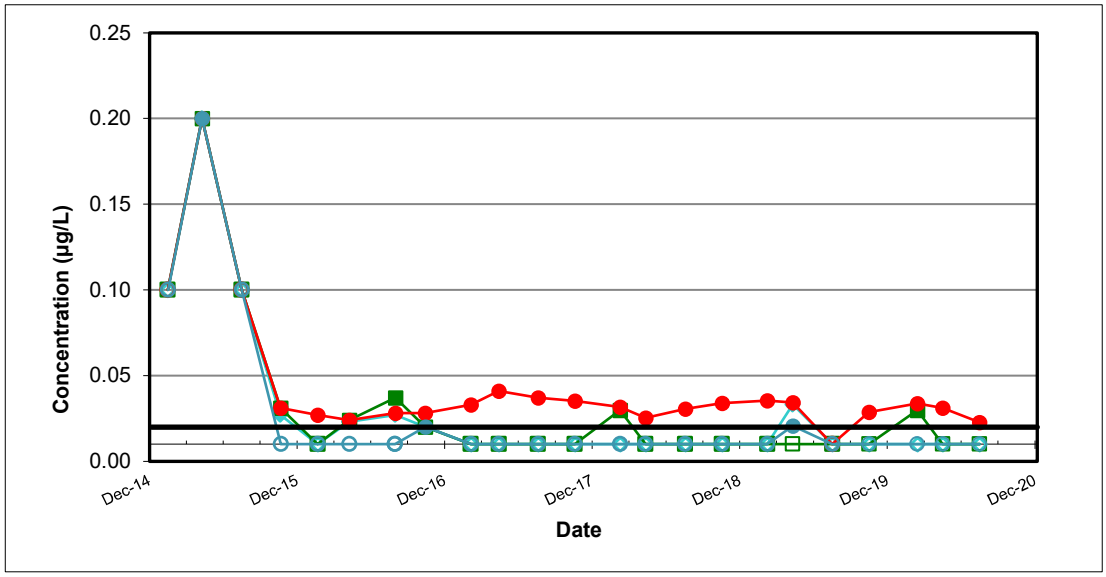
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figures 5 to 9_ SWMU_172-174 Trend Plots.xlsx

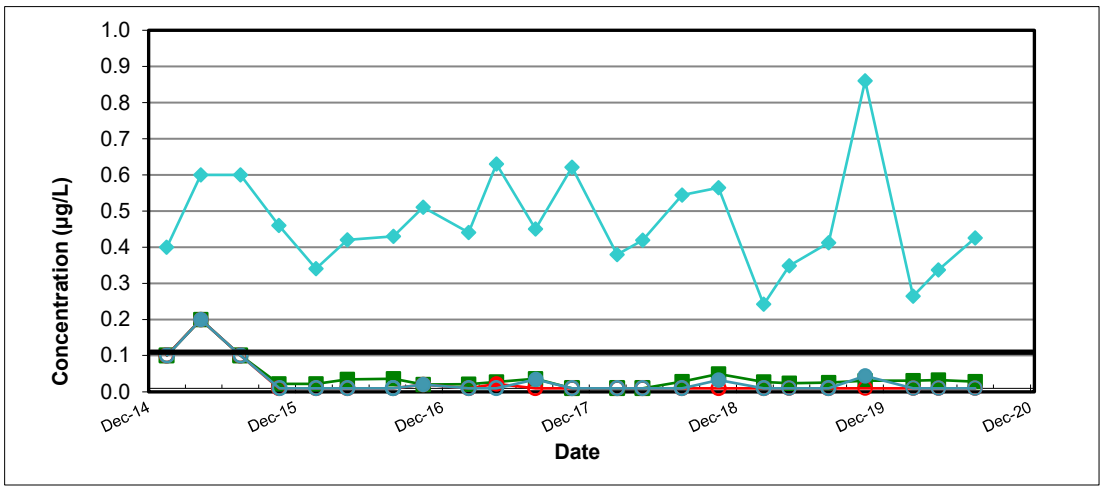
wood.	SWMU-172 AND SWMU-174 TREND PLOTS FOR ARSENIC IN SELECT SOURCE AREA AND DOWNGRADIENT PLUME AREA WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 8



cis-1,2-Dichloroethene



Trichloroethene



Vinyl Chloride

Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

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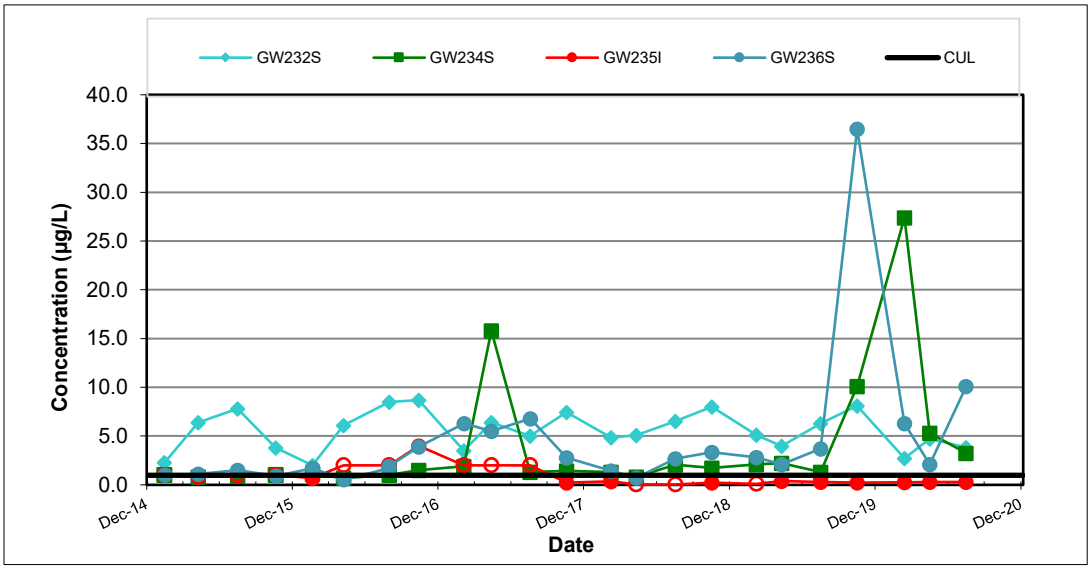
wood.

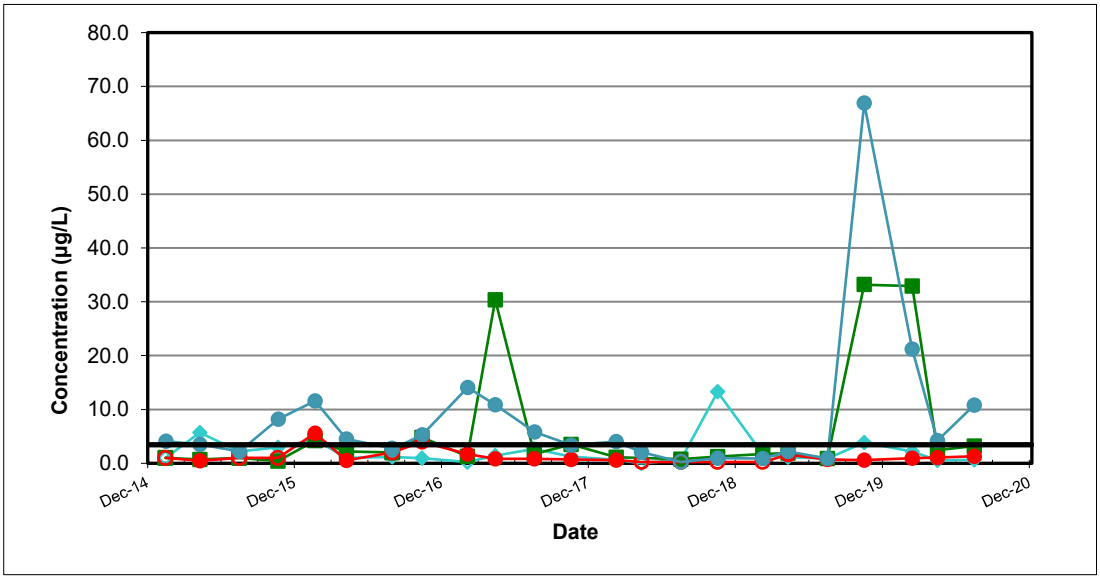
SWMU-172 AND SWMU-174 TREND PLOTS FOR CIS-1,2-DICHLROETHENE, TRICHLOROETHENE, AND VINYL CHLORIDE IN CPOC AREA WELLS
Boeing Renton Facility
Renton, Washington

Project No. 8888

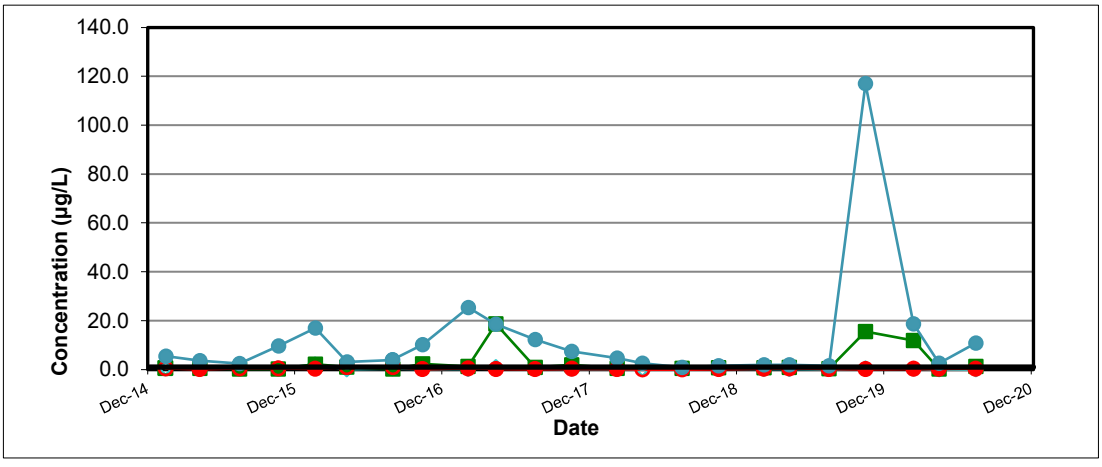
Figure 9



Arsenic



Copper



Lead

Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	SWMU-172 AND SWMU-174 TREND PLOTS FOR ARSENIC, COPPER AND LEAD IN CPOC AREA WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 10

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CEDAR RIVER TRAIL PARK

NISHIWAKI LANE

APPROXIMATE PROPERTY LINE

CONDITIONAL POC

CEDAR RIVER WATERWAY

BUILDING 4-45

BUILDING 4-79

BUILDING 4-78

BUILDING 4-77

GW132S

GW133S

GW237S
14.58

GW238I

GW209S

GW210S

GW022S

GW023S

GW024D

GW026I

GW027D

GW031S
14.68

GW244S
14.65

GW030S

GW042D

GW041S

GW243I

GW151D

GW033S
14.61

GW239I

GW039S

GW040S

GW240D
14.31

GW143S
14.60

GW034S
14.42

GW037S

GW038S

GW035S

GW036S

GW242I

GW241S

AOC-037 (URE-25)

AOC-013 (URE-17)

AOC-026 (URE-54)

AOC-015 (URE-24)

AOC-014 (URE-18)

AOC-054 (URE-23)

DISPENSER ISLAND (REMOVED)

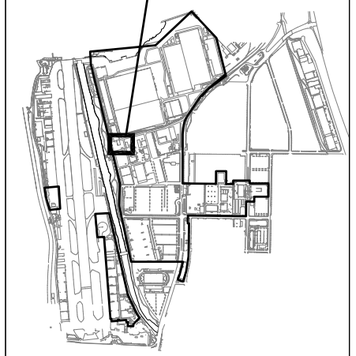
SWMU-181

PP083 PP084 PP085 PP086 PP087 PP088 PP089 PP090 PP091 PP092 PP093 PP094 PP095 PP096 PP097 PP098 PP099 PP100 PP101 PP102 PP103 PP104 PP105 PP106 PP107 PP108 PP109 PP110 PP111 PP112 PP113 PP114 PP115 PP116 PP117 PP118 PP119 PP120 PP121 PP122 PP123 PP124 PP125 PP126 PP127 PP128 PP129 PP130 PP131 PP132 PP133 PP134 PP135 PP136 PP137 PP138 PP139 PP140 PP141 PP142 PP143 PP144 PP145 PP146 PP147 PP148 PP149 PP150 PP151 PP152 PP153 PP154 PP155 PP156 PP157 PP158 PP159 PP160 PP161 PP162 PP163 PP164 PP165 PP166 PP167 PP168 PP169 PP170 PP171 PP172 PP173 PP174 PP175 PP176 PP177 PP178 PP179 PP180 PP181 PP182 PP183 PP184 PP185 PP186 PP187 PP188 PP189 PP190 PP191 PP192 PP193 PP194 PP195 PP196 PP197 PP198 PP199 PP200 PP201

B78-01 B78-02 B78-03 B78-04 B78-05 B78-06 B78-07 B78-08 B78-09 B78-10 B78-11 B78-12 B78-13 B78-14 B78-15 B78-16 B78-17 B78-18 B78-19 B78-20 B78-21

SVE-01 SVE-02 SVE-03 SVE-04 SVE-05 SVE-06 SVE-07 SVE-08 SVE-09 SVE-10 SVE-11 SVE-12 SVE-13 SVE-14 SVE-15

4-78/79 SWMU/AOC GROUP LOCATION MAP



BOEING RENTON FACILITY MAP

LEGEND

- GW033S 14.61 — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION (NGVD-FEET)
- GENERAL GROUNDWATER FLOW DIRECTION
- GW042D — EXTRACTION WELL
- GW032D — ABANDONED MONITORING WELL
- SVE-15 — HORIZONTAL SVE WELL
- B78-12 — BIOREMEDIATION INJECTION WELL
- EXTRACTION WELL CONVERTED TO INJECTION WELL
- PP083 — PUSH-PROBE SAMPLE LOCATION
- FENCE
- APPROXIMATE FUEL AND NON-CHLORINATED VOC SOURCE AREAS
- REMOVED UST (WESTON, 2001)
- CONDITIONAL POINT OF COMPLIANCE

HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK

NOTES

1. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994
2. UST LOCATIONS AND PRODUCT PIPING LOCATIONS FROM FINAL REMEDIAL INVESTIGATION (WESTON, 2001)
3. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 20 FEET IN DEPTH.
   'I' DESIGNATION INDICATES WELL SCREENED BETWEEN 20 AND 25 FEET IN DEPTH.
   'D' DESIGNATION INDICATES WELL SCREENED GREATER THAN 25 FEET IN DEPTH.
4. THE GROUNDWATER FLOW DIRECTION SHOWN IS BASED ON HISTORICAL GROUNDWATER DATA.

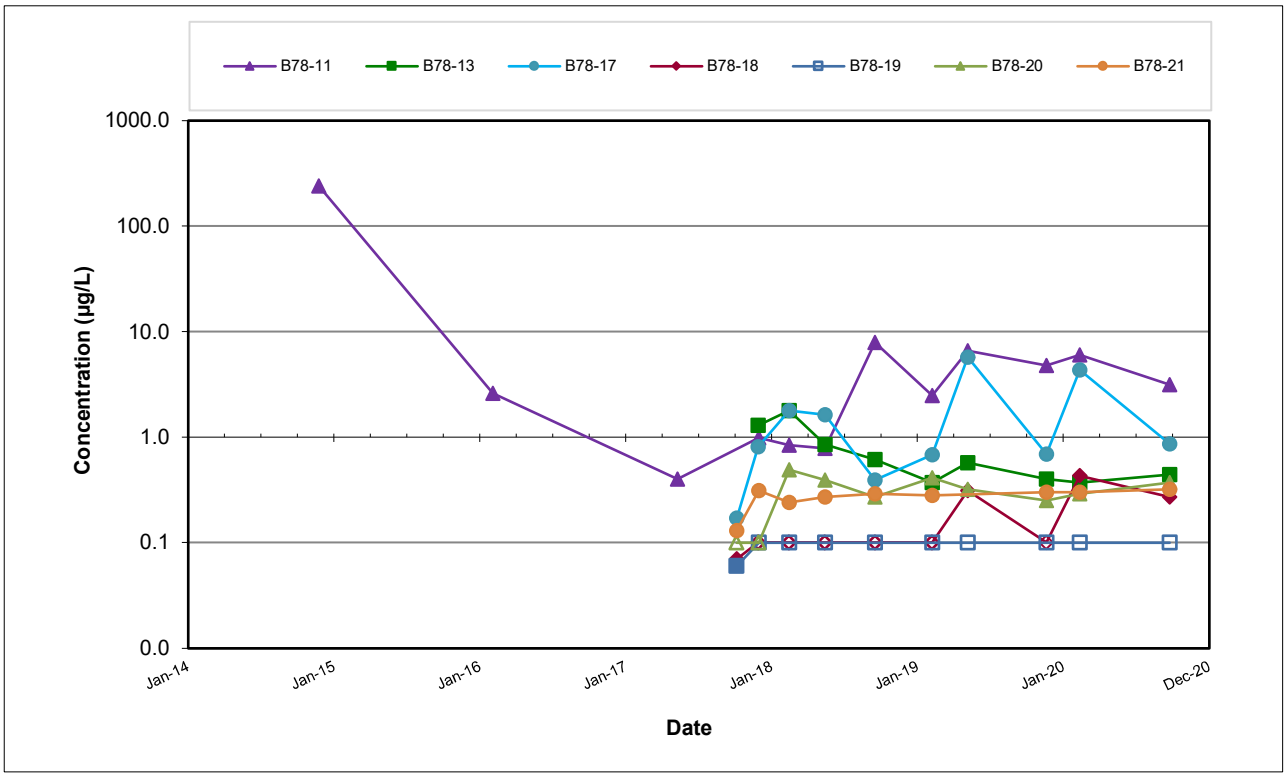
BOEING

0 25 50
APPROXIMATE SCALE IN FEET

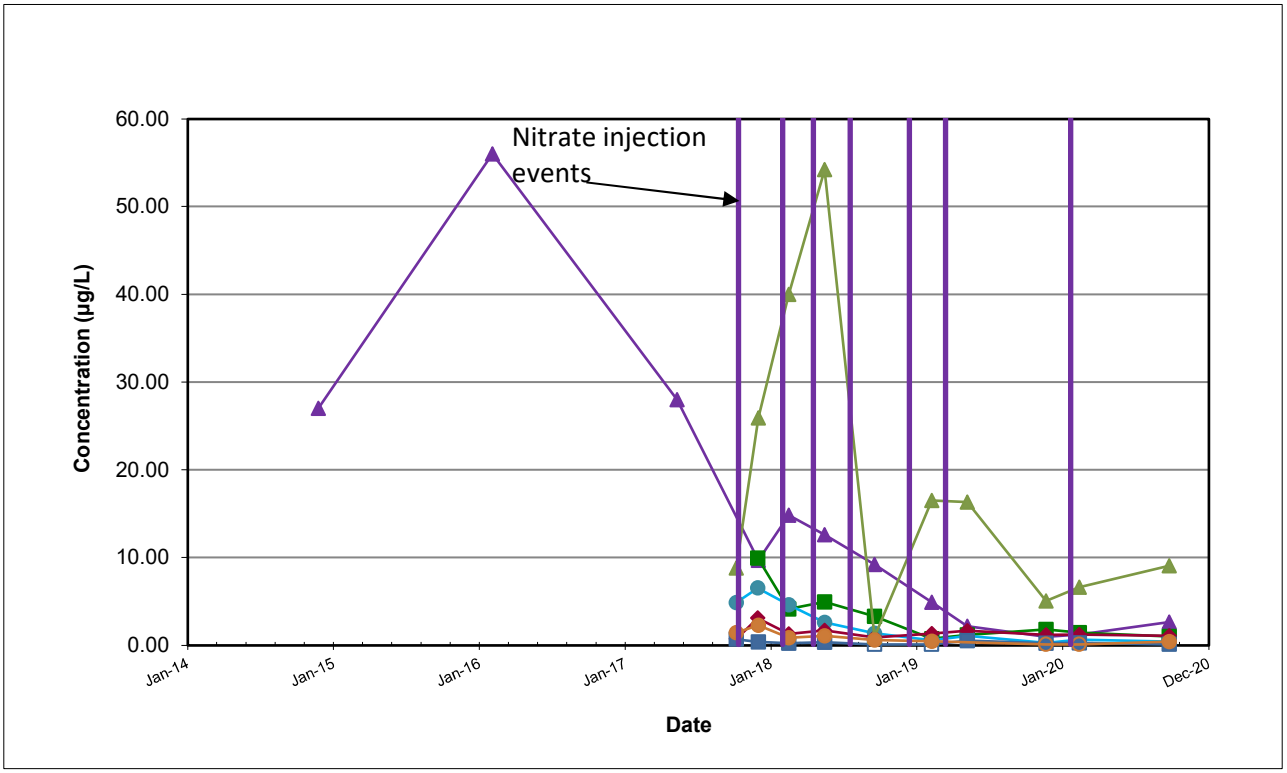
BUILDING 4-78/79 SWMU/AOC GROUP MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS AUGUST 11, 2020 Boeing Renton Facility Renton, Washington

By: APS	Date: 10/29/20	Project No. PS20203450
wood.		Figure 11

Plot Date: 10/29/20 - 11:11am, Plotted by: adam.stenberg
Drawing Path: S:\8888_2006\105_3q20_GW-MR\, Drawing Name: Figure_11_Building 4-78-79_GW-ELEV_3Q20.dwg



cis-1,2-Dichloroethene

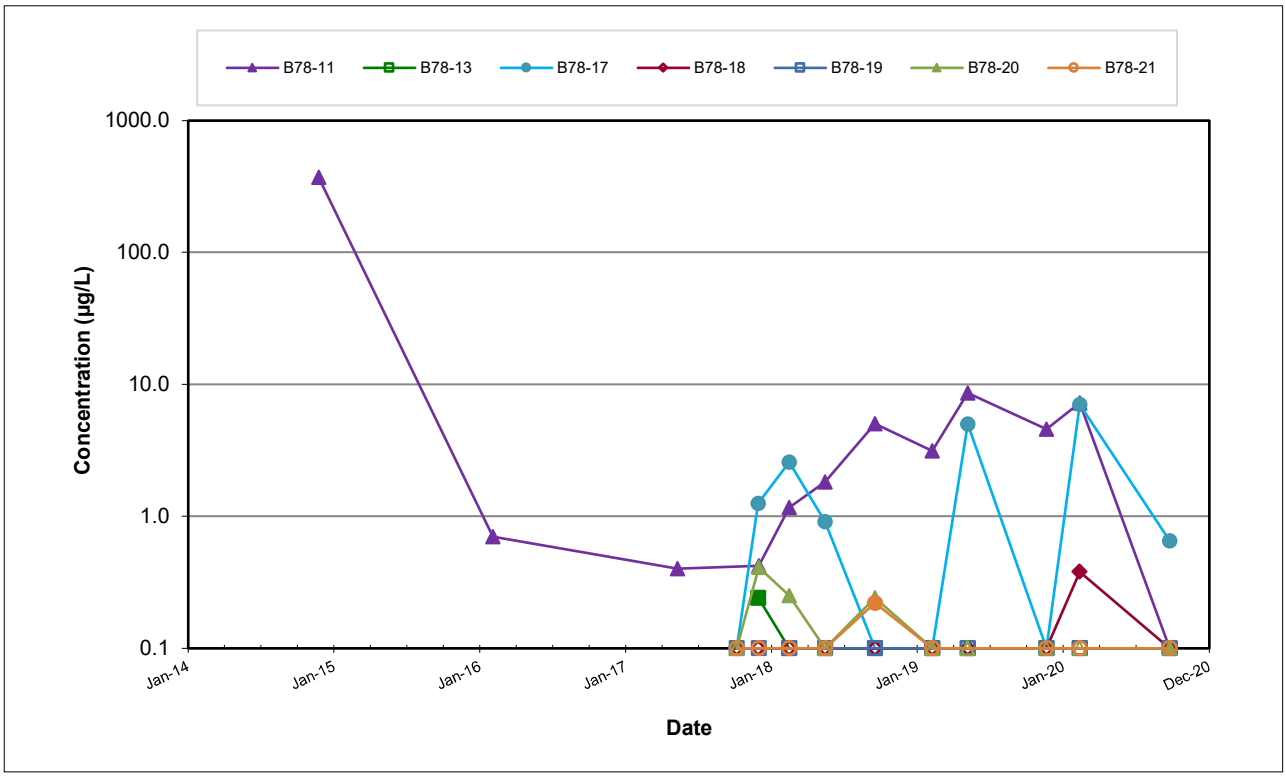


Benzene

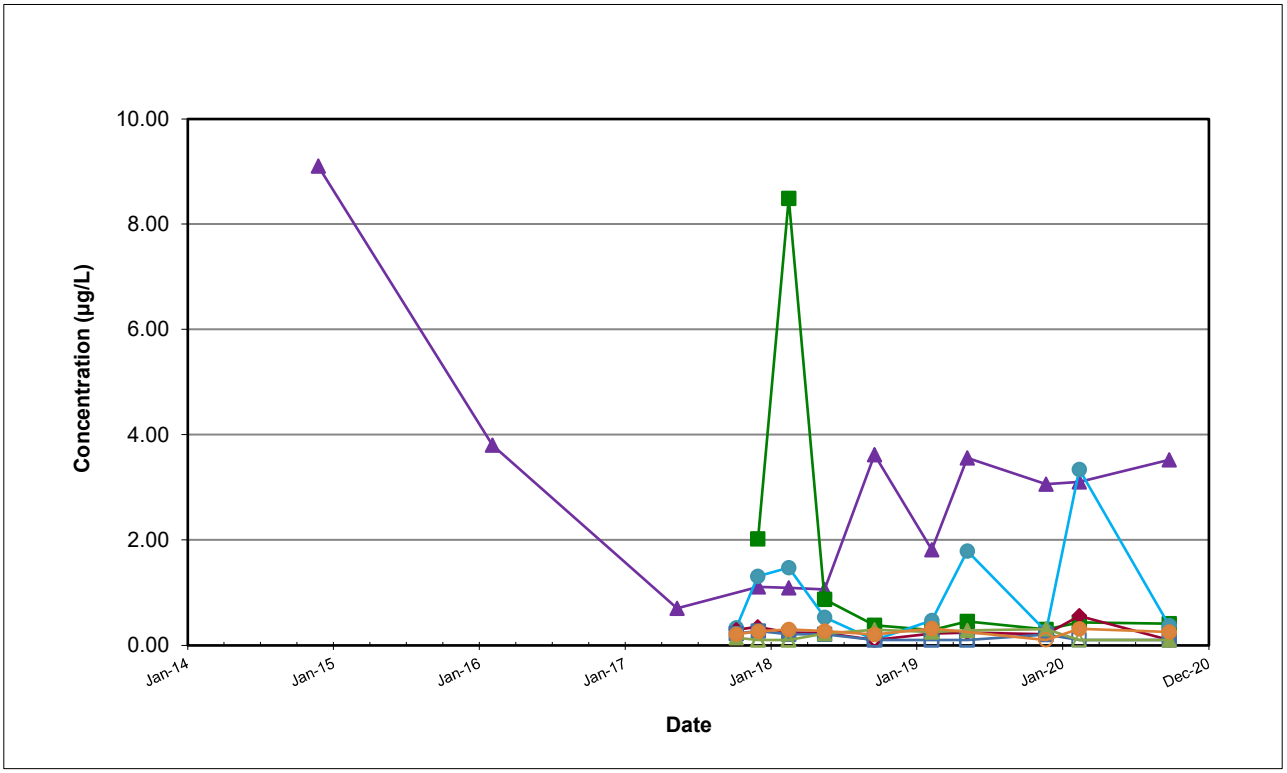
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BUILDING 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR CIS-1,2-DICHLOROETHENE AND BENZENE IN INJECTION WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 12

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 12 to 18_ Bldg 4-78-79.xlsx



Trichloroethene

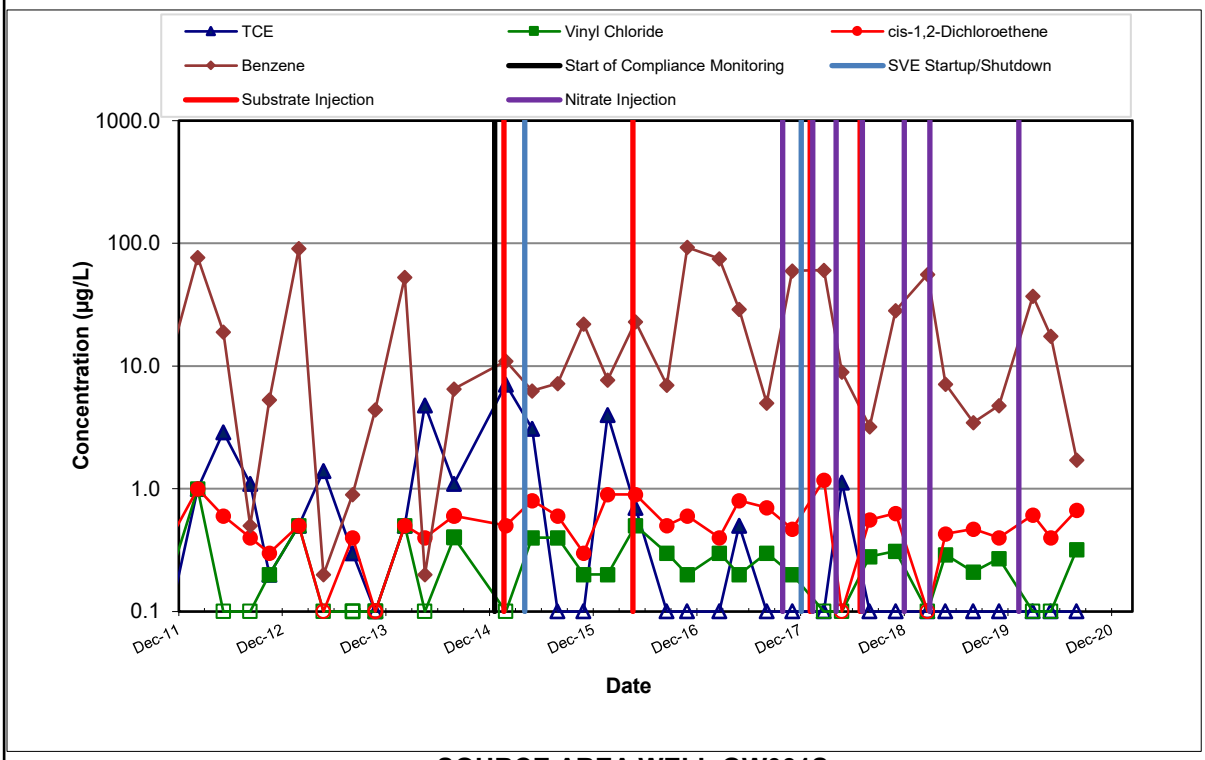


Vinyl Chloride

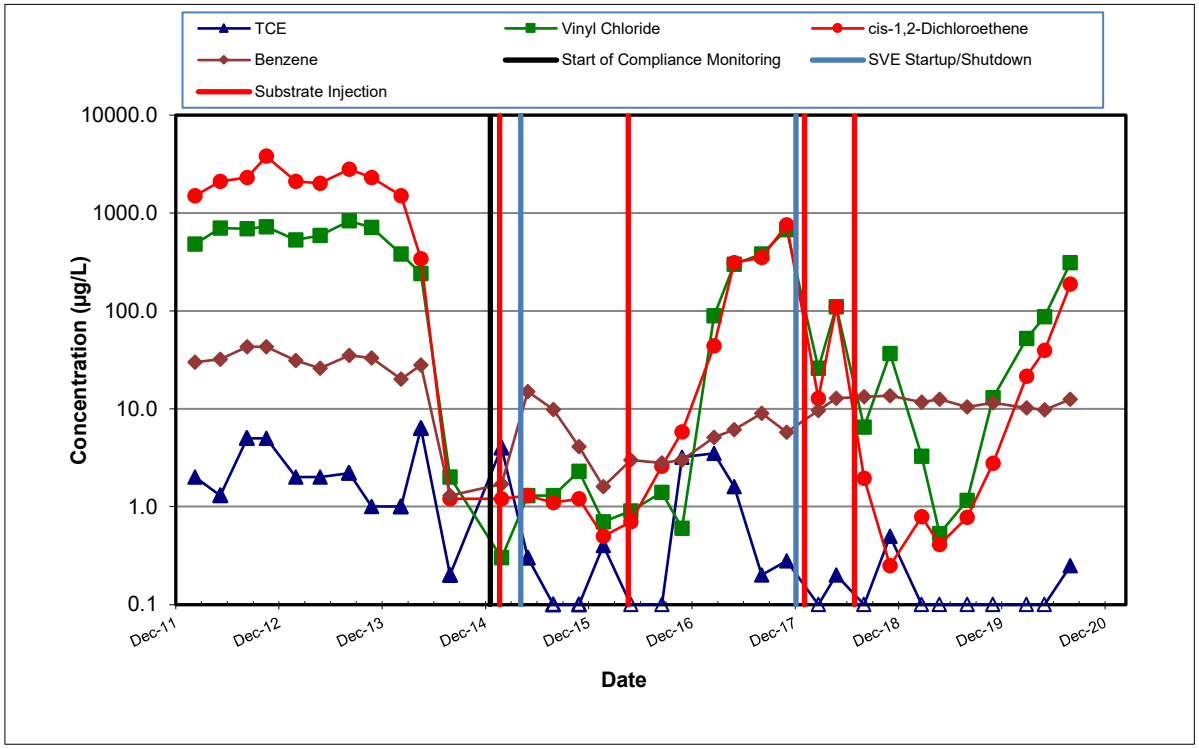
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BUILDING 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR TRICHLOROETHENE AND VINYL CHLORIDE IN INJECTION WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 13

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 12 to 18_ Bldg 4-78-79.xlsx



SOURCE AREA WELL GW031S

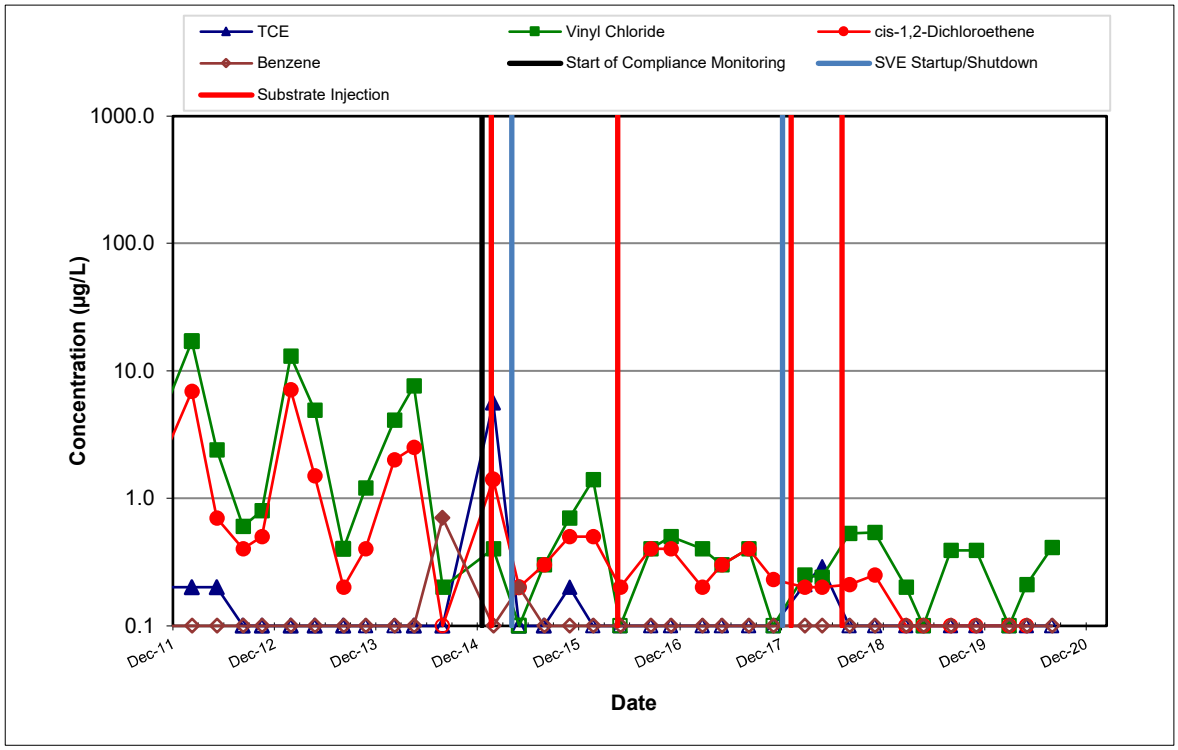


SOURCE AREA WELL GW033S

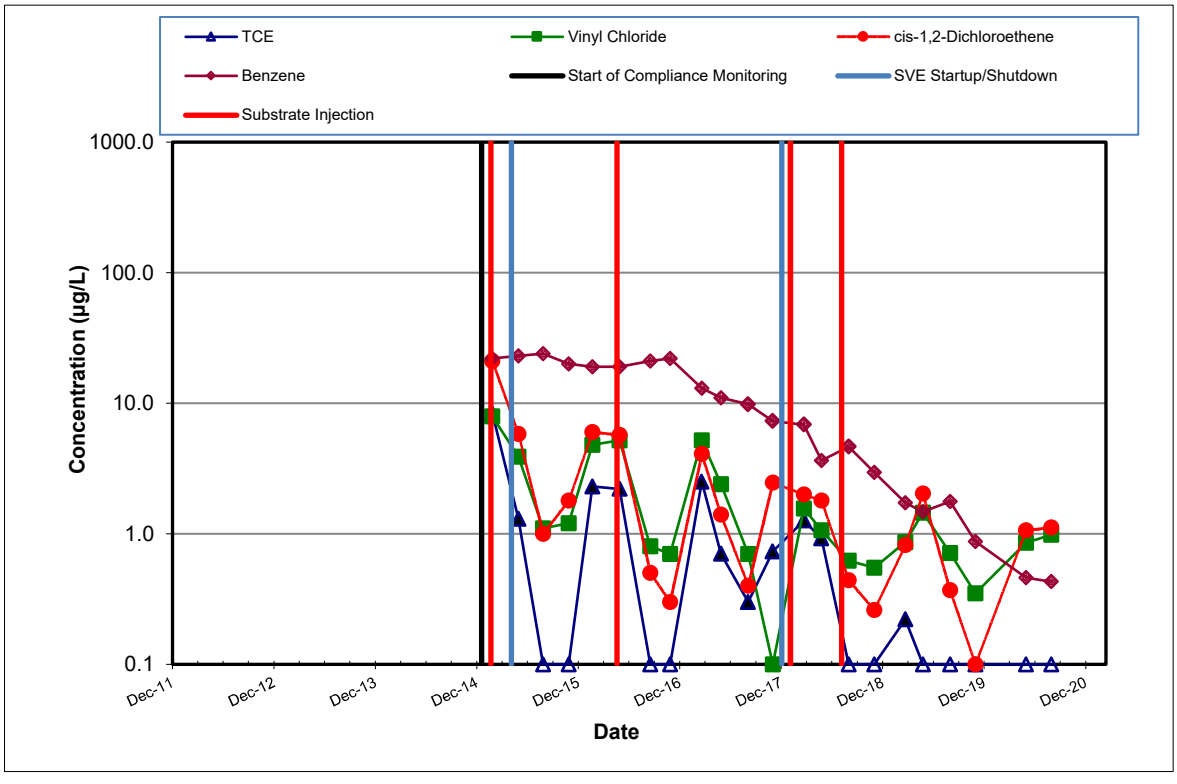
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BUILDING 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR SOURCE AREA WELLS GW031S AND GW033S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 14

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figures 12 to 18_ Bldg 4-78-79 Trend Plots.xlsx



SOURCE AREA WELL GW034S

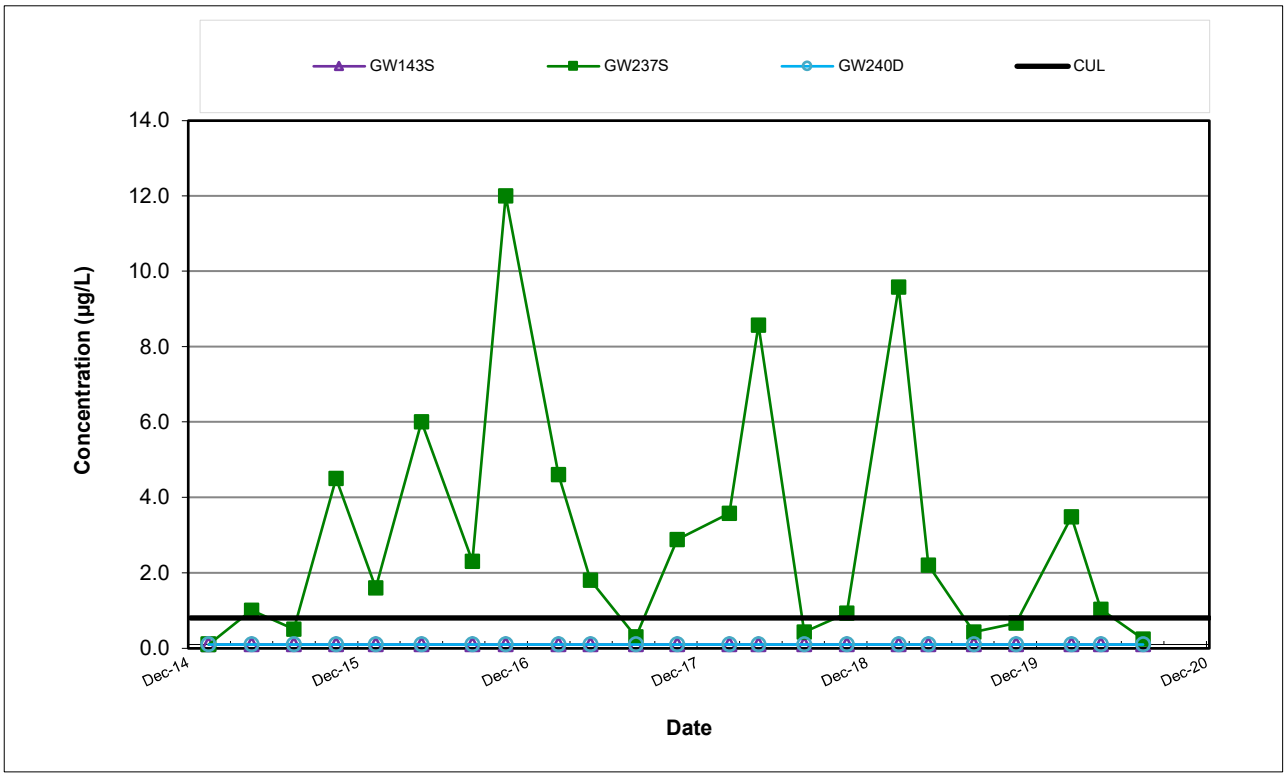


SOURCE AREA WELL GW244S

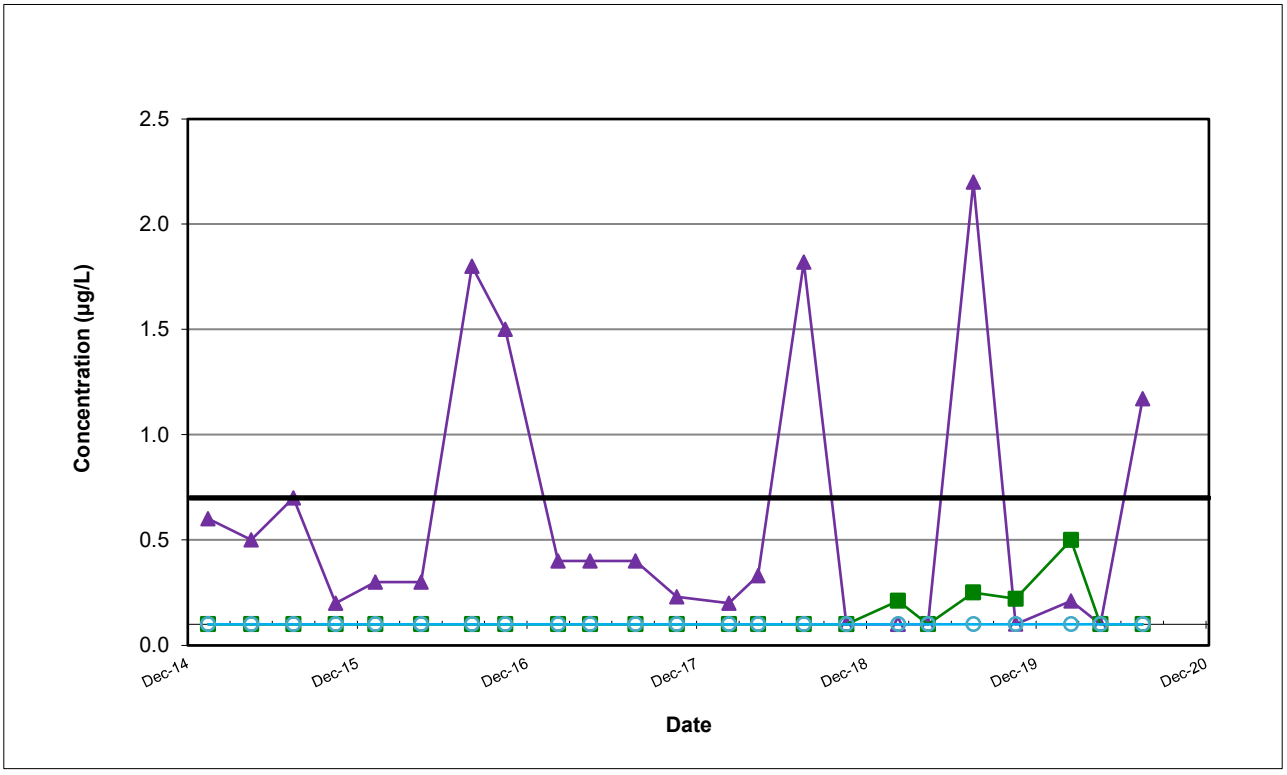
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BLDG 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR SOURCE AREA WELLS GW034S AND GW244S Boeing Renton Facility	Project No. 8888 Figure 15

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 12 to 18_ Bldg 4-78-79.xlsx



Benzene

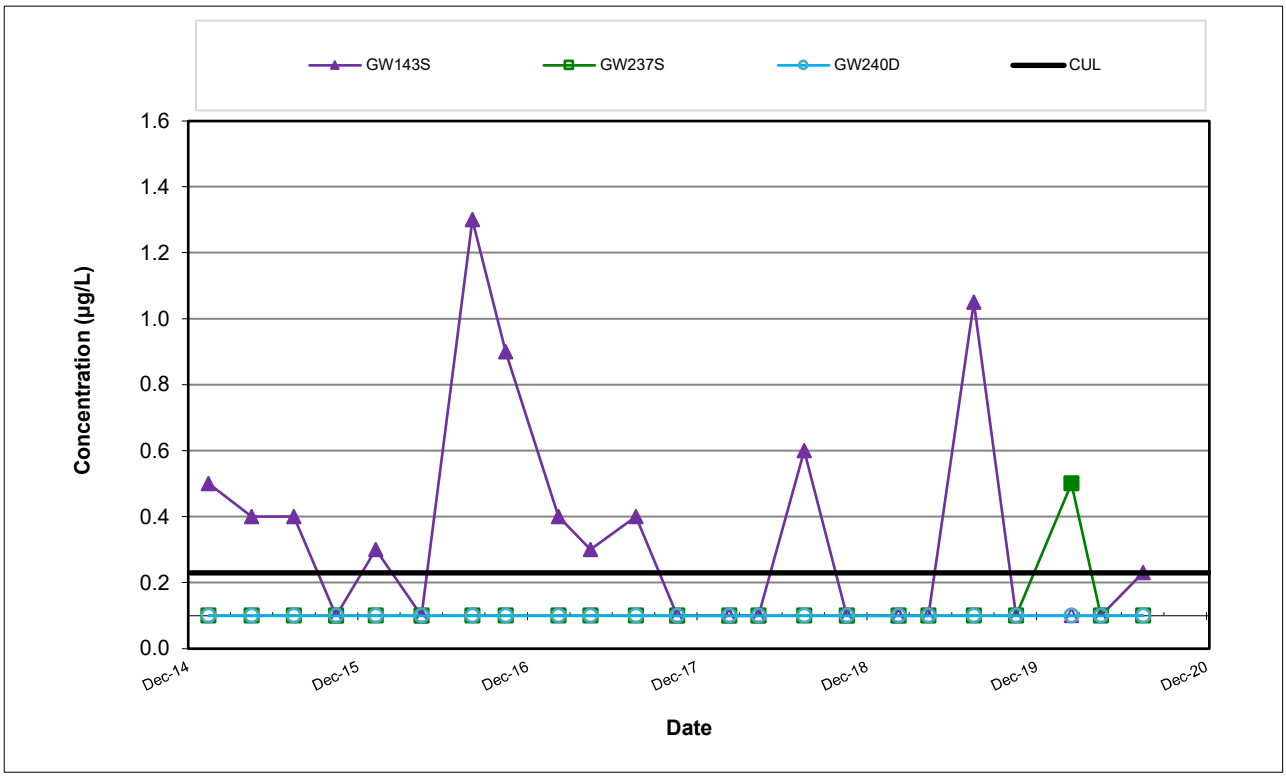


cis-1,2-Dichloroethene

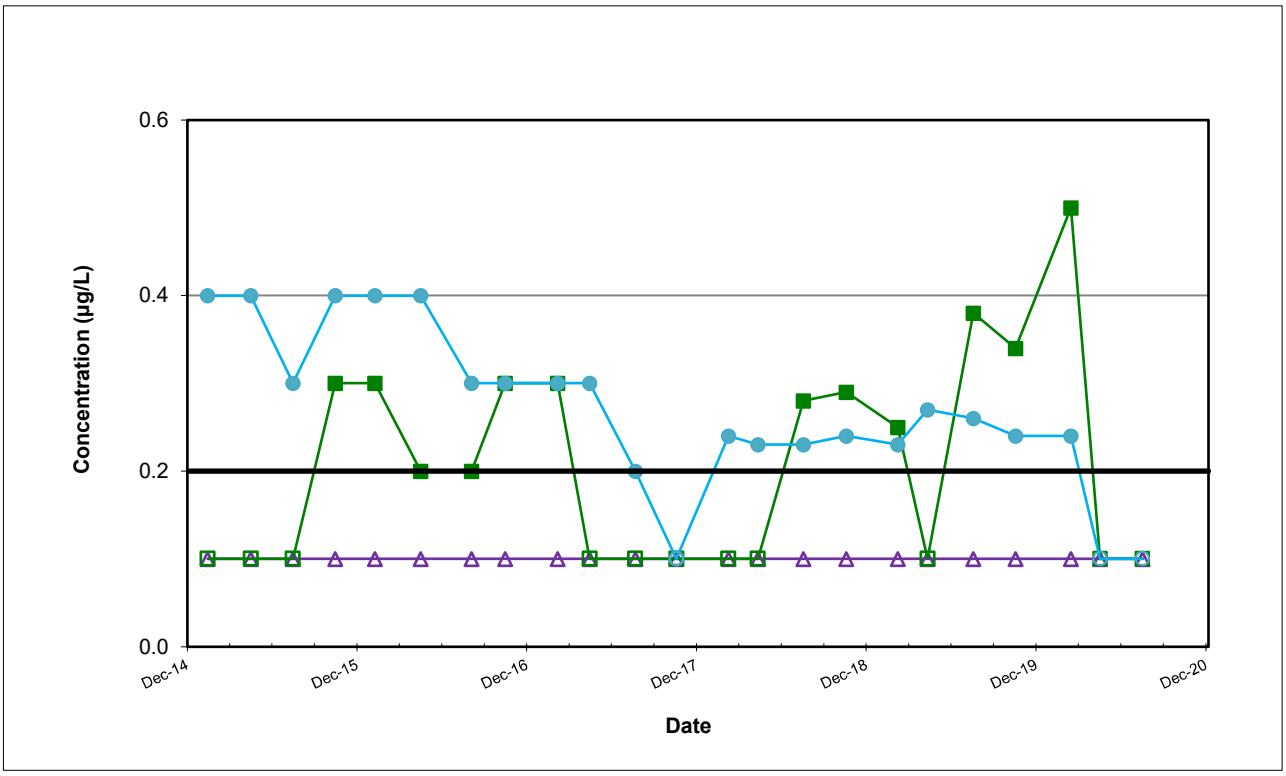
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BUILDING 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR BENZENE AND CIS-1,2-DICHLOROETHENE IN CPOC AREA WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 16

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figures 12 to 18_ Bldg 4-78-79 Trend Plots.xlsx



Trichloroethene

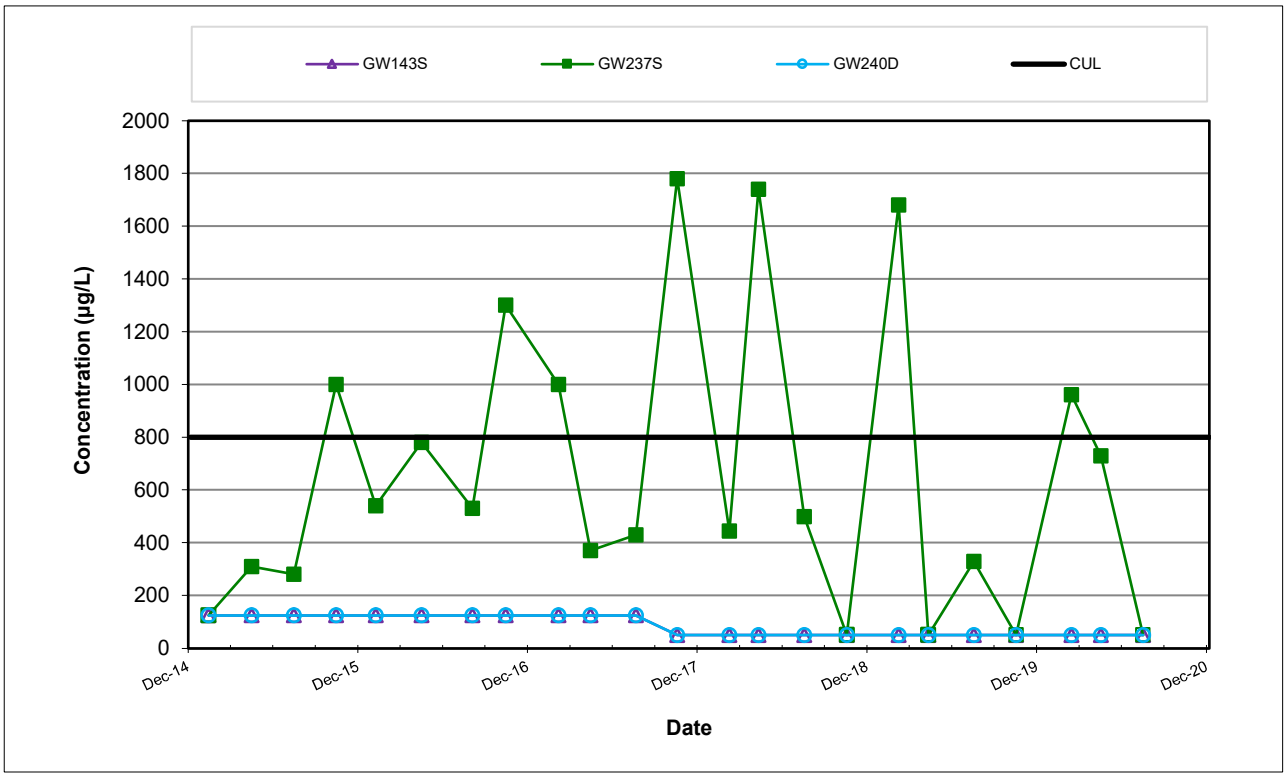


Vinyl Chloride

Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BUILDING 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR TRICHLOROETHENE AND VINYL CHLORIDE IN CPOC AREA WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 17

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figures 12 to 18_ Bldg 4-78-79 Trend Plots.xlsx

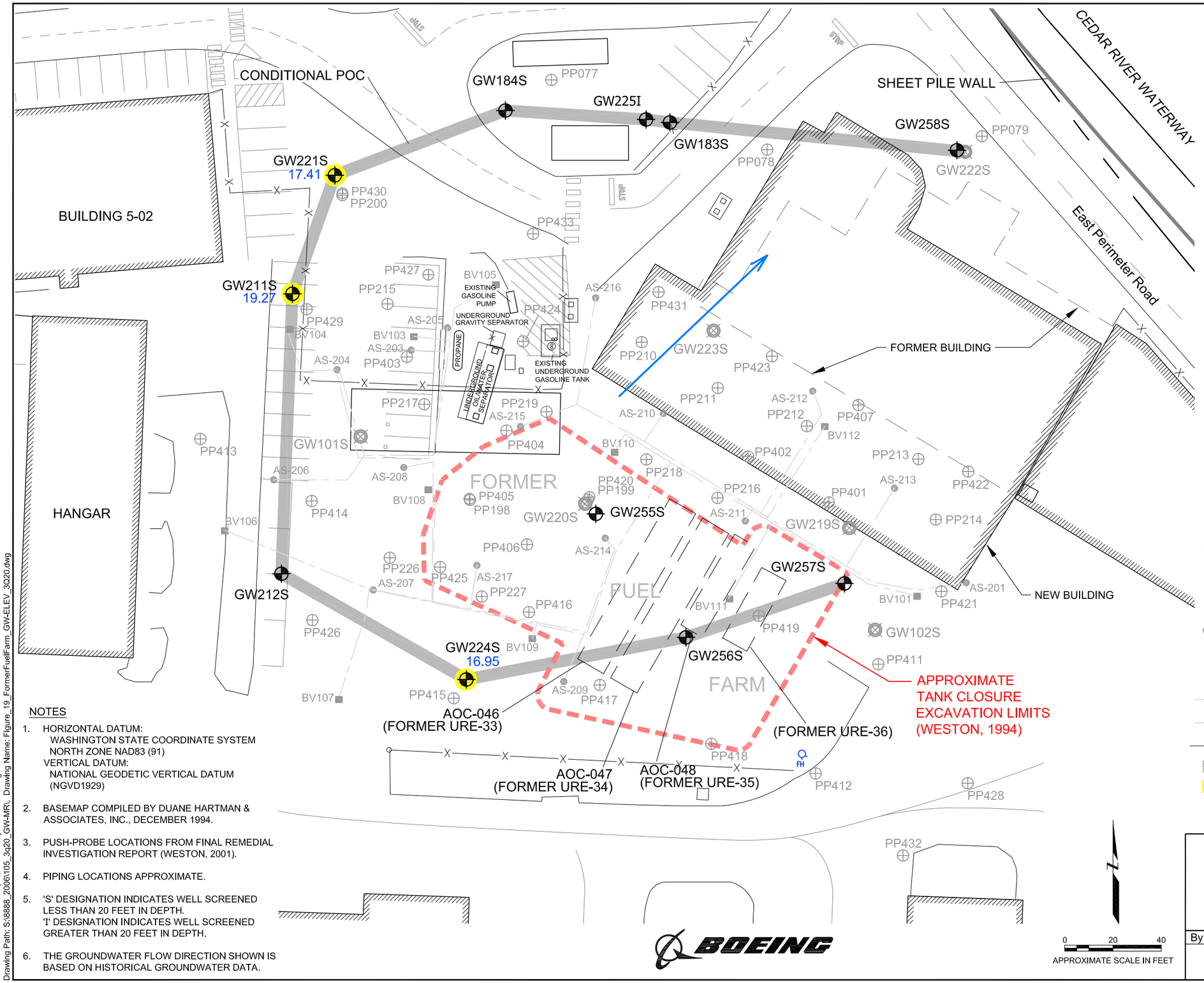


TPH as Gasoline

Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	BUILDING 4-78/79 SWMU/AOC GROUP TREND PLOTS FOR TPH AS GASOLINE IN CPOC AREA WELLS Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 18

P:\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figures 12 to 18_ Bldg 4-78-79 Trend Plots.xlsx



NOTES

1. HORIZONTAL DATUM:
   WASHINGTON STATE COORDINATE SYSTEM
   NORTH ZONE NAD83 (91)
   VERTICAL DATUM:
   NATIONAL GEODETIC VERTICAL DATUM
   (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994.
3. PUSH-PROBE LOCATIONS FROM FINAL REMEDIAL INVESTIGATION REPORT (WESTON, 2001).
4. PIPING LOCATIONS APPROXIMATE.
5. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 20 FEET IN DEPTH.
   'I' DESIGNATION INDICATES WELL SCREENED GREATER THAN 20 FEET IN DEPTH.
6. THE GROUNDWATER FLOW DIRECTION SHOWN IS BASED ON HISTORICAL GROUNDWATER DATA.

LEGEND

- GW224S 16.95 — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION (NGVD-FEET)
- GENERAL DIRECTION OF GROUNDWATER FLOW
- PP042 — PUSH PROBE LOCATION
- GW222S — ABANDONED GROUNDWATER MONITORING WELL
- AS-204 — FORMER UNDERGROUND AIR SPARGING WELL
- BV112 — FORMER UNDERGROUND BIOVENTING WELL
- FORMER UNDERGROUND BIOVENTING LINE
- FORMER UNDERGROUND AIR SPARGING LINE
- FENCE
- CONDITIONAL POINT OF COMPLIANCE
- HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK

0 20 40
APPROXIMATE SCALE IN FEET

FORMER FUEL FARM AOC GROUP MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS AUGUST 10, 2020

Boeing Renton Facility
Renton, Washington

By: APS	Date: 10/26/20	Project No. 8888
wood.		Figure 19

BOEING

Plot Date: 10/26/20 - 5:06pm, Plotted by: adam.stenberg
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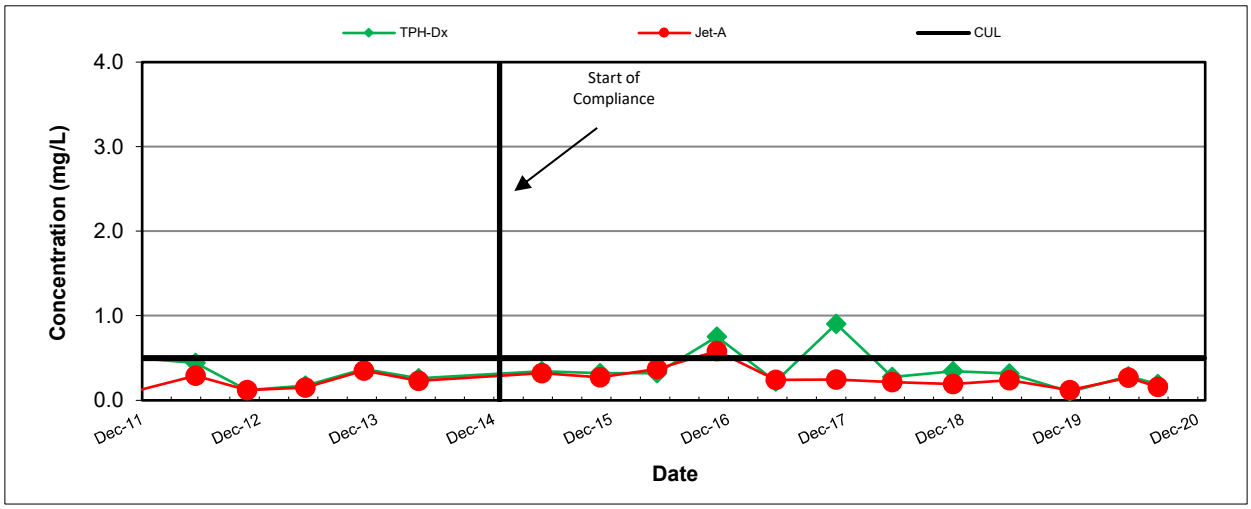
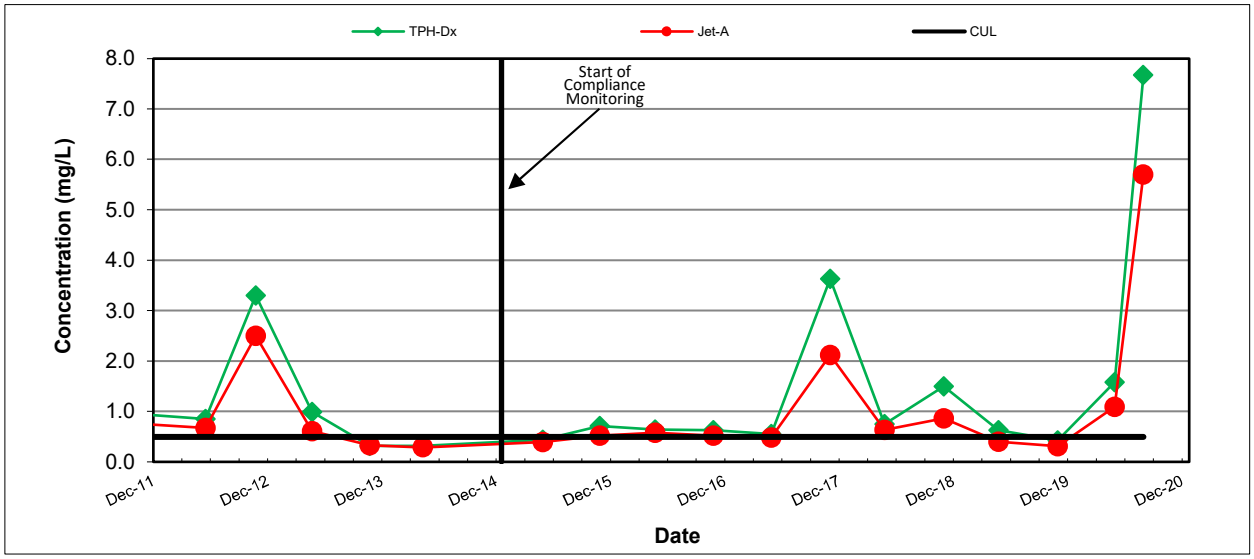
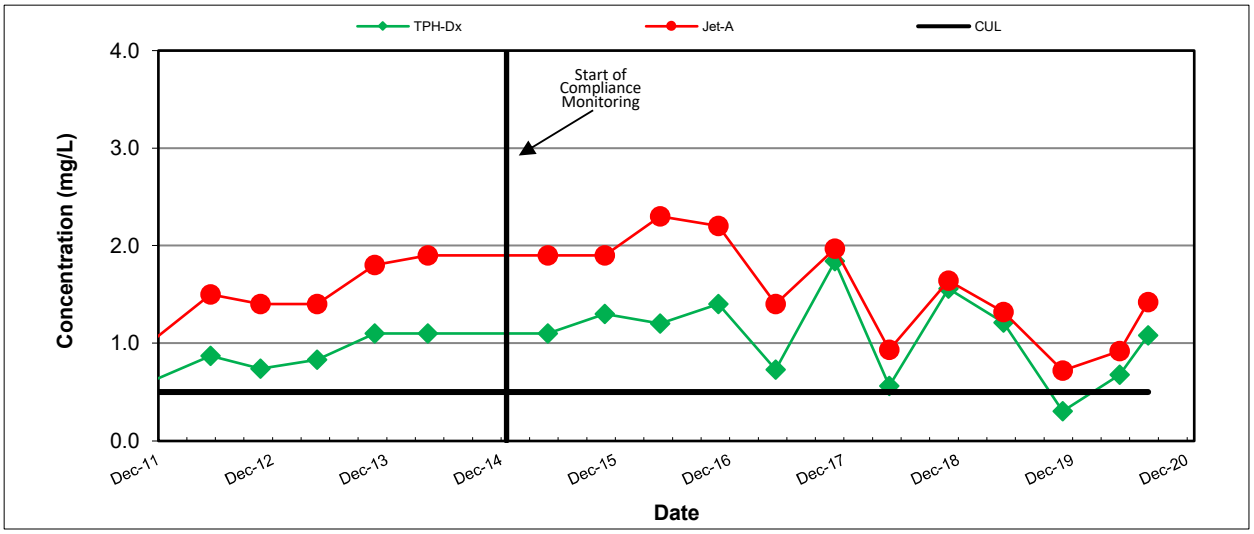


CPOC WELL GW211S



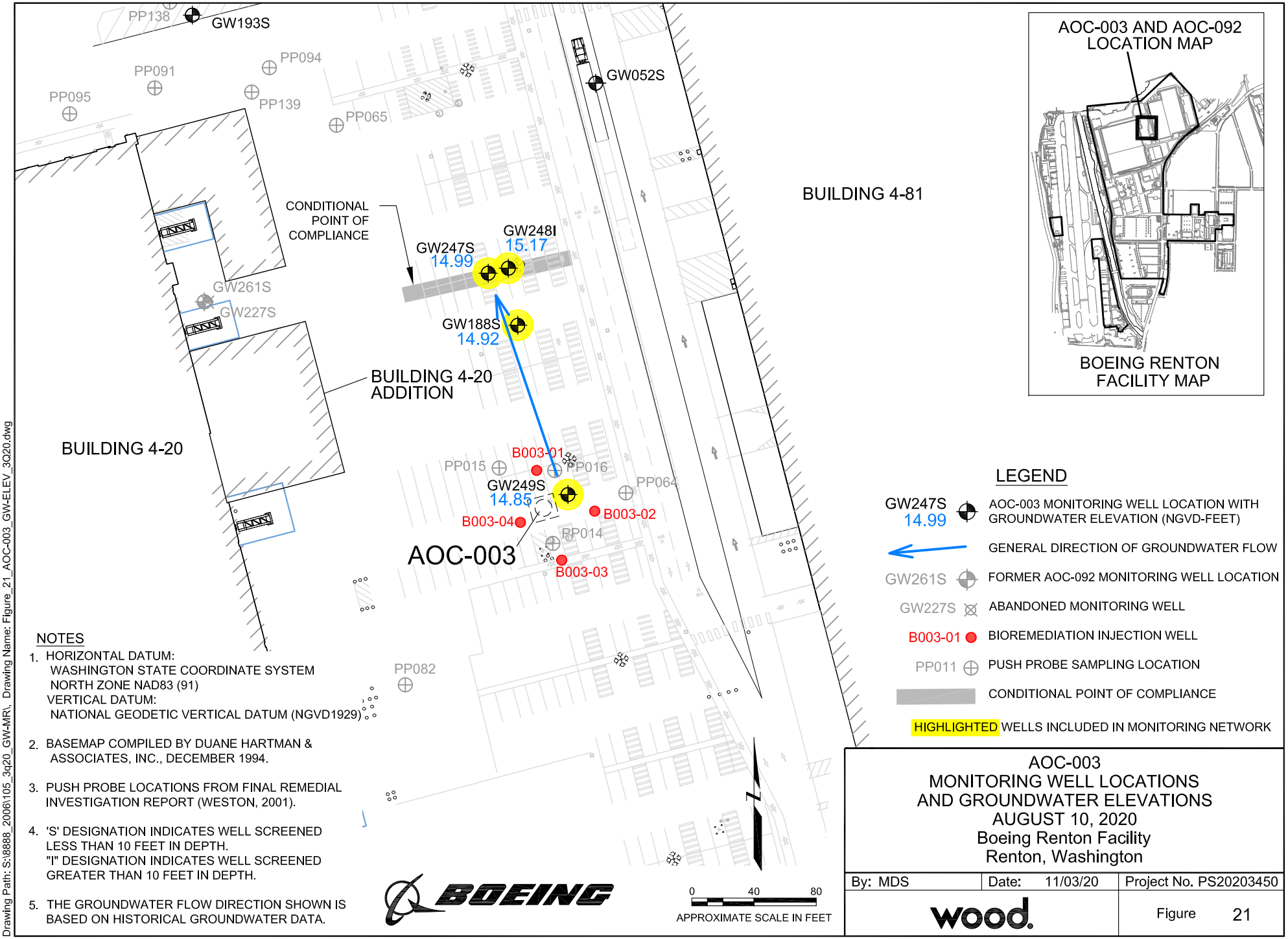
CPOC WELL GW221S



CPOC WELL GW224S

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 20_FFF CPOC trend plot.xls

wood.	FORMER FUEL FARM AOC GROUP TREND PLOTS FOR CPOC AREA WELLS GW211S, GW221S, AND GW224S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 20



NOTES

1. HORIZONTAL DATUM:
   WASHINGTON STATE COORDINATE SYSTEM
   NORTH ZONE NAD83 (91)
   VERTICAL DATUM:
   NATIONAL GEODETIC VERTICAL DATUM (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994.
3. PUSH PROBE LOCATIONS FROM FINAL REMEDIAL INVESTIGATION REPORT (WESTON, 2001).
4. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 10 FEET IN DEPTH.
   "I" DESIGNATION INDICATES WELL SCREENED GREATER THAN 10 FEET IN DEPTH.
5. THE GROUNDWATER FLOW DIRECTION SHOWN IS BASED ON HISTORICAL GROUNDWATER DATA.

BOEING

AOC-003
MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS
AUGUST 10, 2020
Boeing Renton Facility
Renton, Washington

By: MDS	Date: 11/03/20	Project No. PS20203450
wood.		Figure 21

Plot Date: 11/03/20 - 8:20am, Plotted by: adam.stenberg
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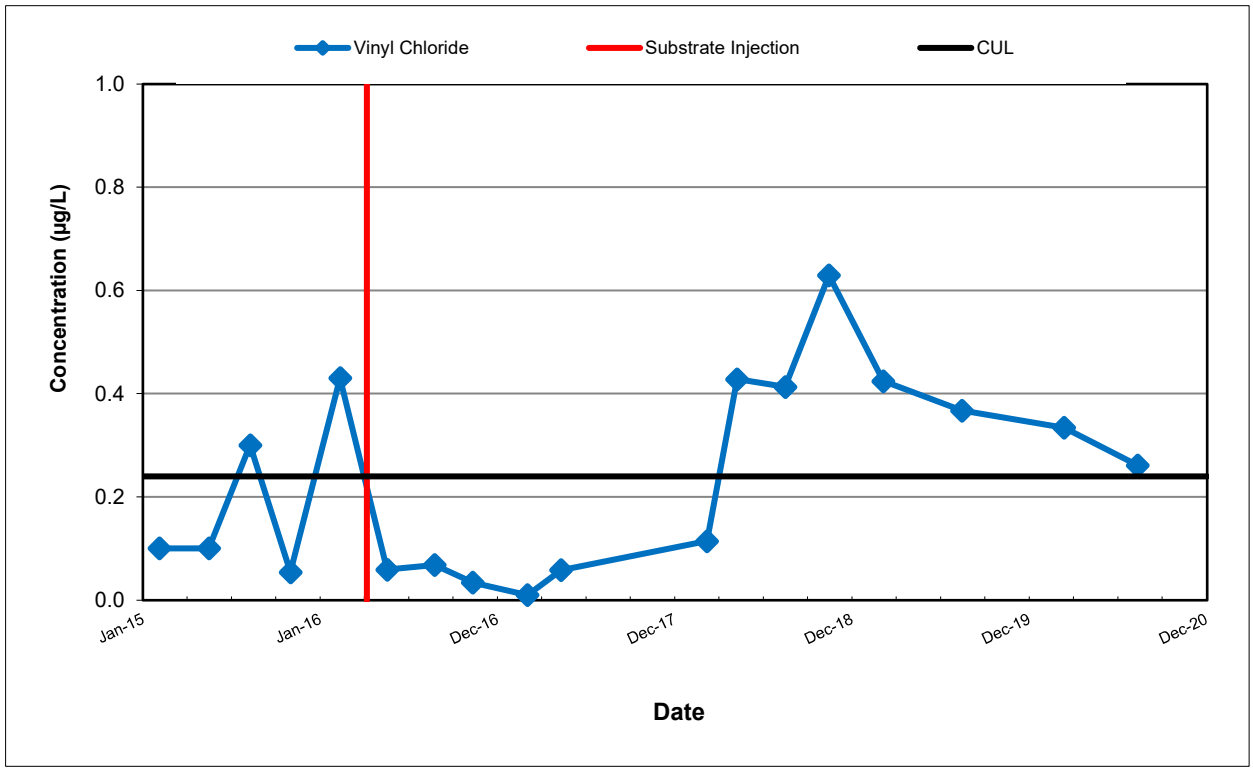
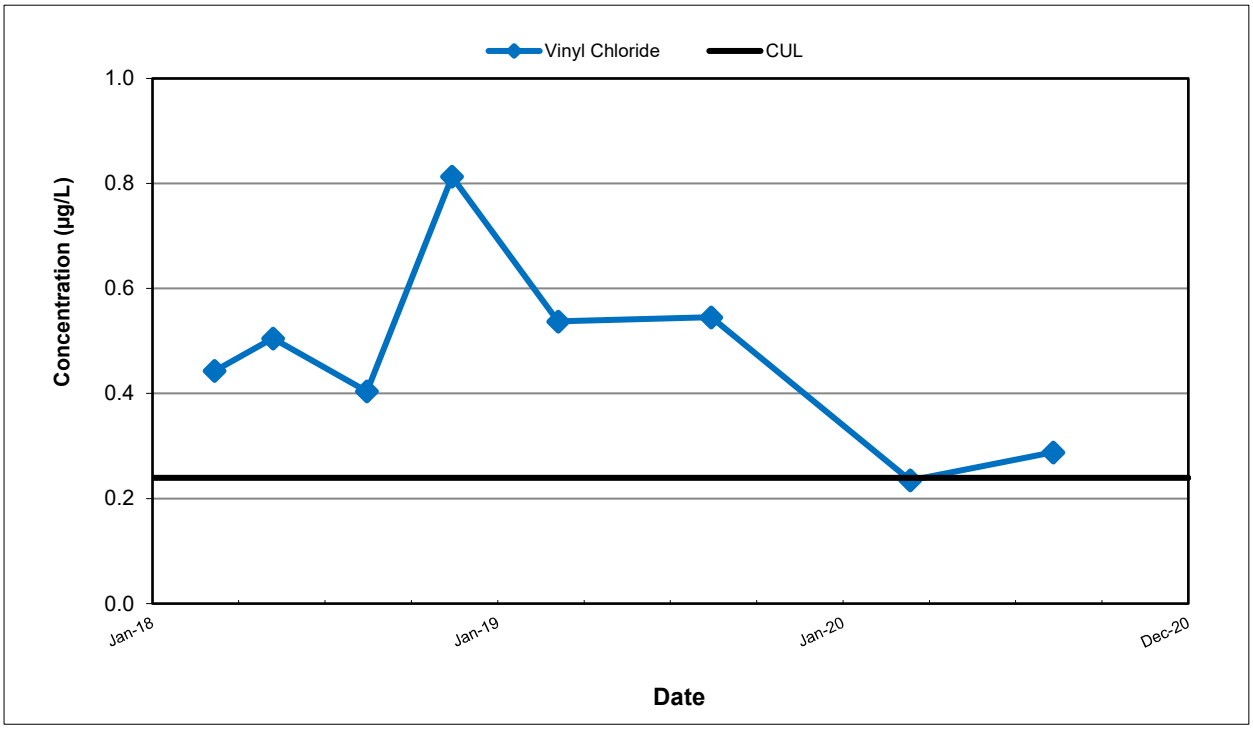


SOURCE AREA WELL GW249S

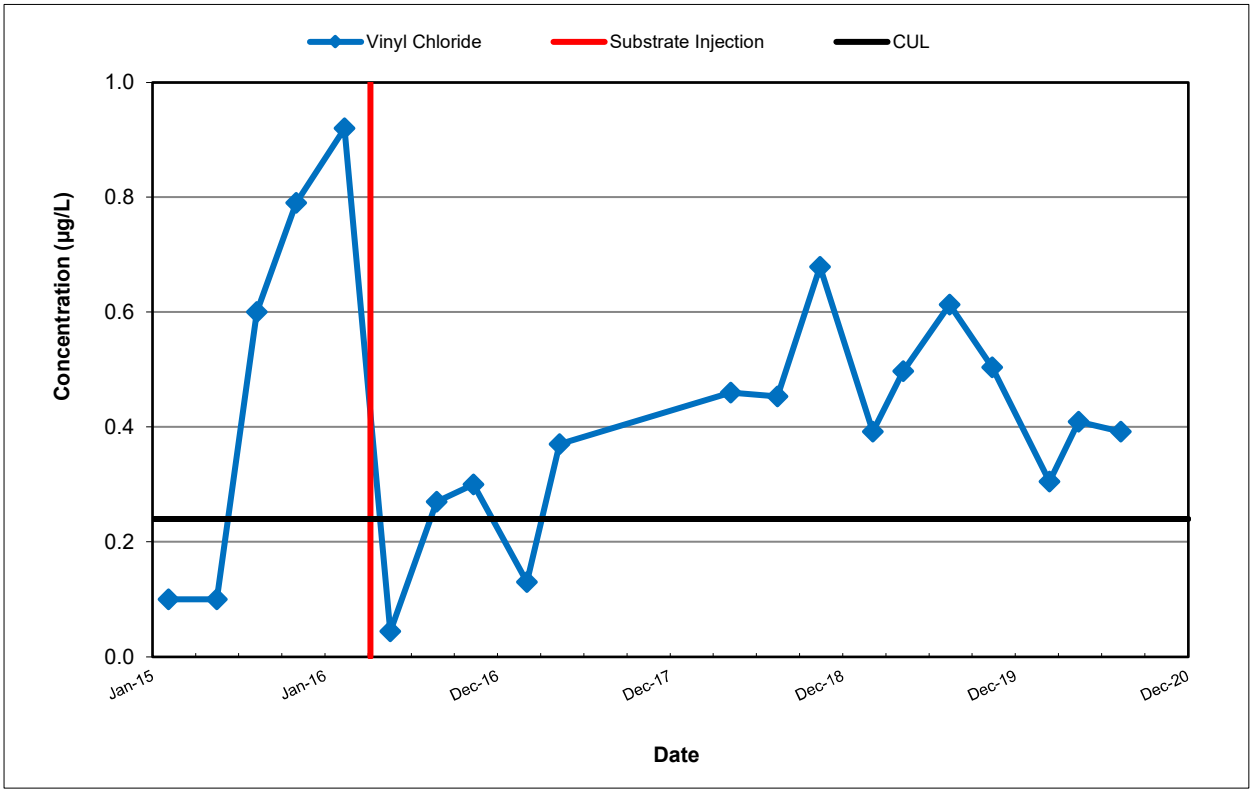


DOWNGRADIENT PLUME AREA WELL GW188S

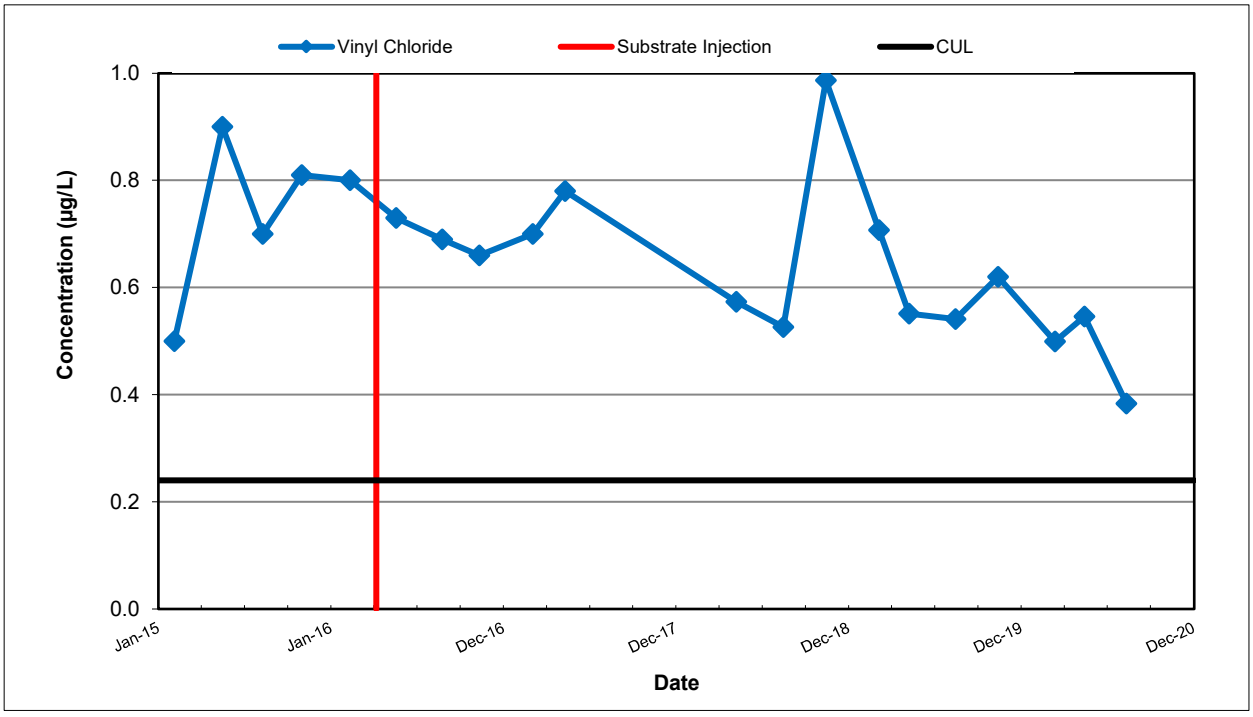
Note: non-detected values shown at one-half the reporting limit and with an open symbol

wood.	AOC-003 HISTORICAL TREND PLOTS FOR SOURCE AREA WELL GW249S AND DOWNGRADIENT PLUME AREA WELL GW188S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 22

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 22 to 24_AOC 003-4.xls



CPOC WELL GW247S

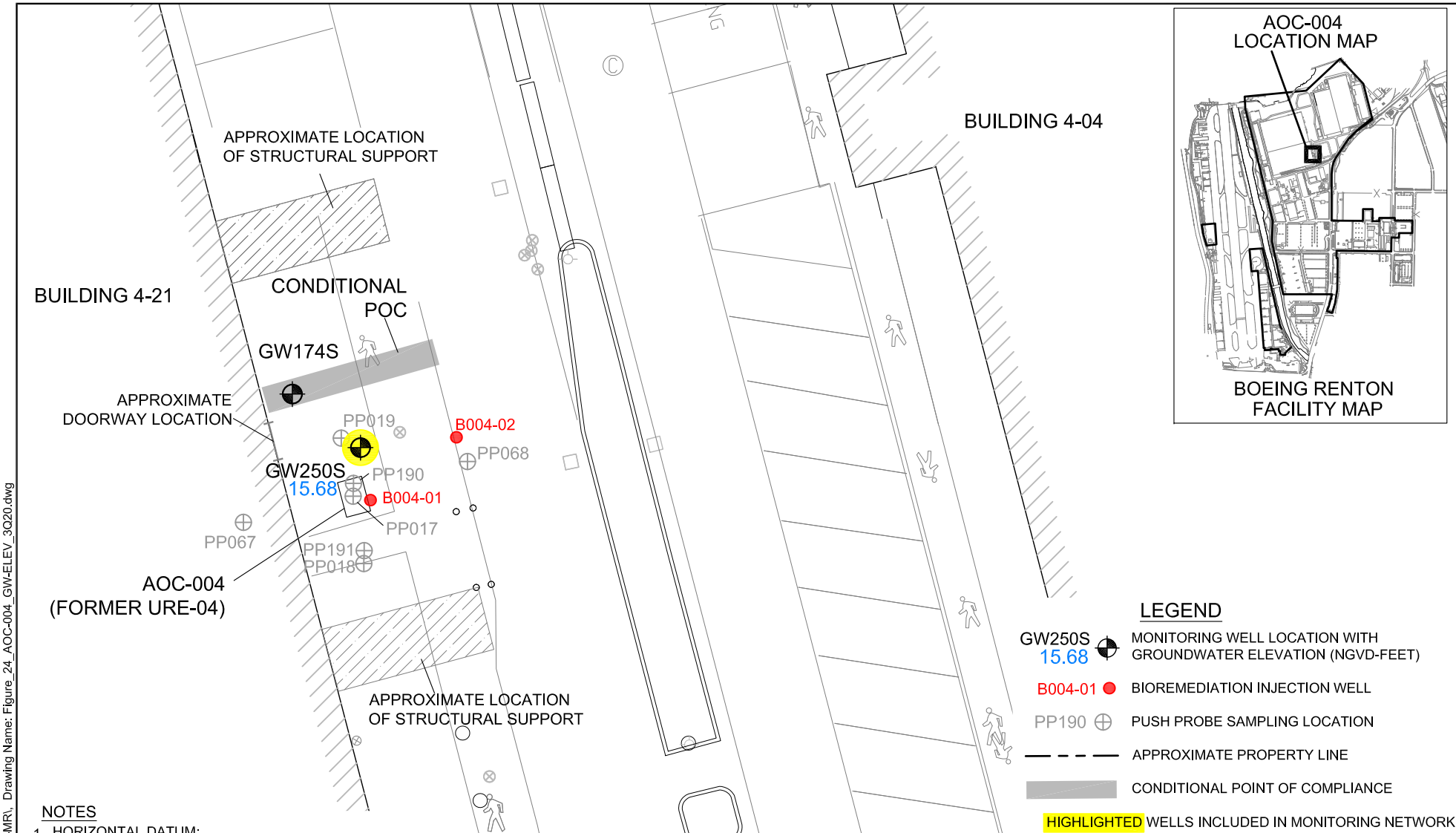


CPOC WELL GW248I

Note: non-detected values shown at one-half the reporting limit and with an open symbol

wood.	AOC-003 HISTORICAL TREND PLOTS FOR CPOC WELLS GW247S AND GW248I Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 23

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 22 to 24_AOC 003-4.xls



LEGEND

- GW250S 15.68 — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION (NGVD-FEET)
- B004-01 — BIOREMEDIATION INJECTION WELL
- PP190 — PUSH PROBE SAMPLING LOCATION
- APPROXIMATE PROPERTY LINE
- CONDITIONAL POINT OF COMPLIANCE
- HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK

NOTES

1. HORIZONTAL DATUM:
   WASHINGTON STATE COORDINATE SYSTEM
   NORTH ZONE NAD83 (91)
   VERTICAL DATUM:
   NATIONAL GEODETIC VERTICAL DATUM (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994.
3. PUSH PROBE LOCATIONS FROM FINAL REMEDIAL INVESTIGATION REPORT (WESTON, 2001).
4. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 10 FEET IN DEPTH.

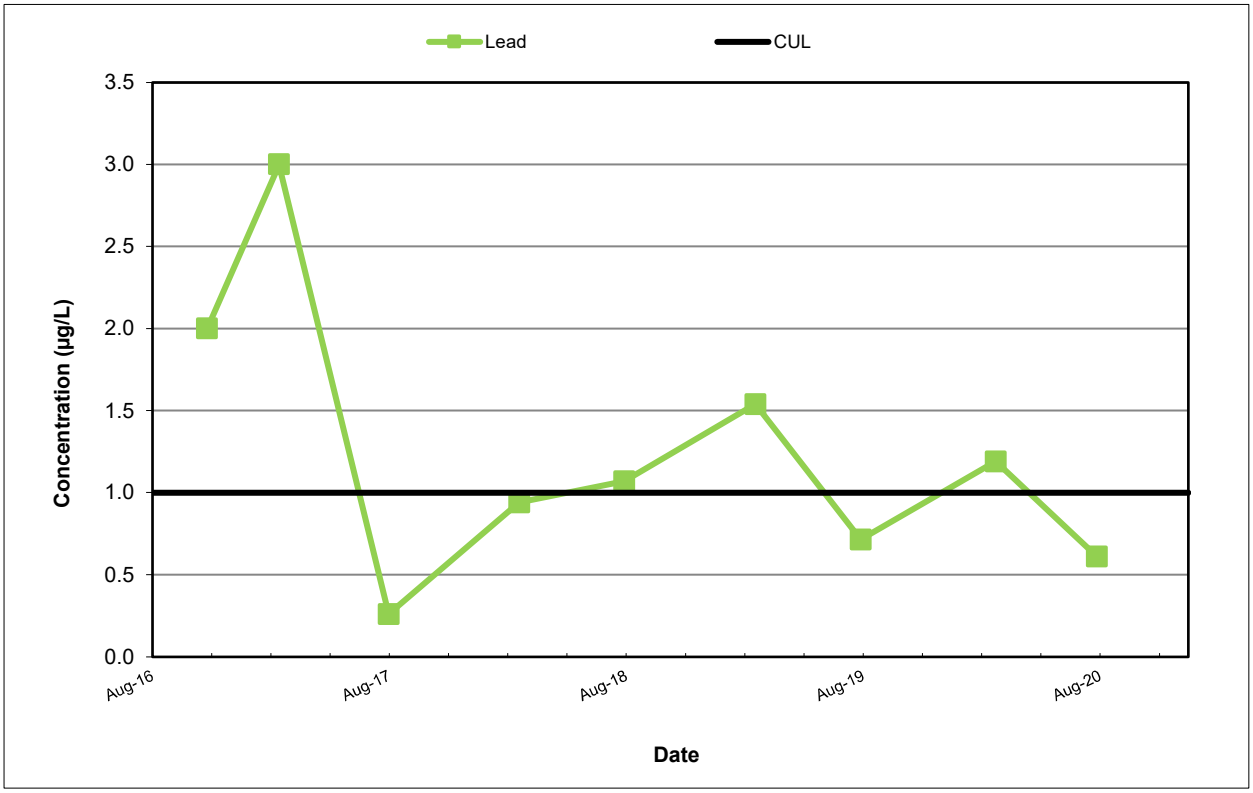
BOEING

0 10 20
APPROXIMATE SCALE IN FEET

AOC-004
MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS
AUGUST 12, 2020
Boeing Renton Facility
Renton, Washington

By: MDS	Date: 10/23/20	Project No. PS20203450
wood.		Figure 24

Plot Date: 10/23/20 - 12:52pm, Plotted by: adam.stenberg
Drawing Path: S:\8888_2006\105_3q20_GW-MR\, Drawing Name: Figure_24_AOC-004_GW-ELEV_3Q20.dwg

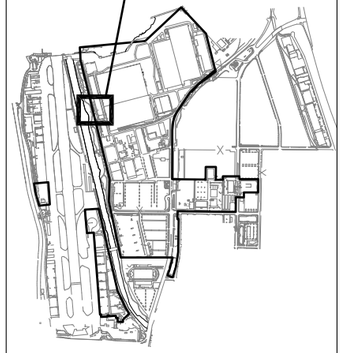


SOURCE AREA WELL GW250S

wood.	AOC-004 HISTORICAL TREND PLOT FOR SOURCE AREA WELL GW250S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 25

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 22 to 24_AOC 003-4.xls

AOC-060
LOCATION MAP



BOEING RENTON
FACILITY MAP

LEGEND

- GW150S 14.52 — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION (NGVD-FEET)
- * — WELL SCREENED IN LOWER PORTION OF AQUIFER, SO WATER LEVEL IS NOT USED FOR CONTOURING.
- GW147S — ELECTRON DONOR INJECTION WELL AND MONITORING WELL
- GENERAL DIRECTION OF GROUNDWATER FLOW
- PP109 — PUSH PROBE SAMPLING LOCATION
- APPROXIMATE PROPERTY LINE
- FENCE LINE
- CONDITIONAL POINT OF COMPLIANCE
- HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK

NOTES

1. HORIZONTAL DATUM:
   WASHINGTON STATE COORDINATE SYSTEM
   NORTH ZONE NAD83 (91)
   VERTICAL DATUM:
   NATIONAL GEODETIC VERTICAL DATUM (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER, 1994
3. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 15 FEET IN DEPTH.
   'I' DESIGNATION INDICATES WELL SCREENED BETWEEN 15 AND 29 FEET.
   'D' DESIGNATION INDICATES WELL SCREENED GREATER THAN 29 FEET IN DEPTH.
4. THE GROUNDWATER FLOW DIRECTION SHOWN IS BASED ON HISTORICAL GROUNDWATER DATA.

BOEING

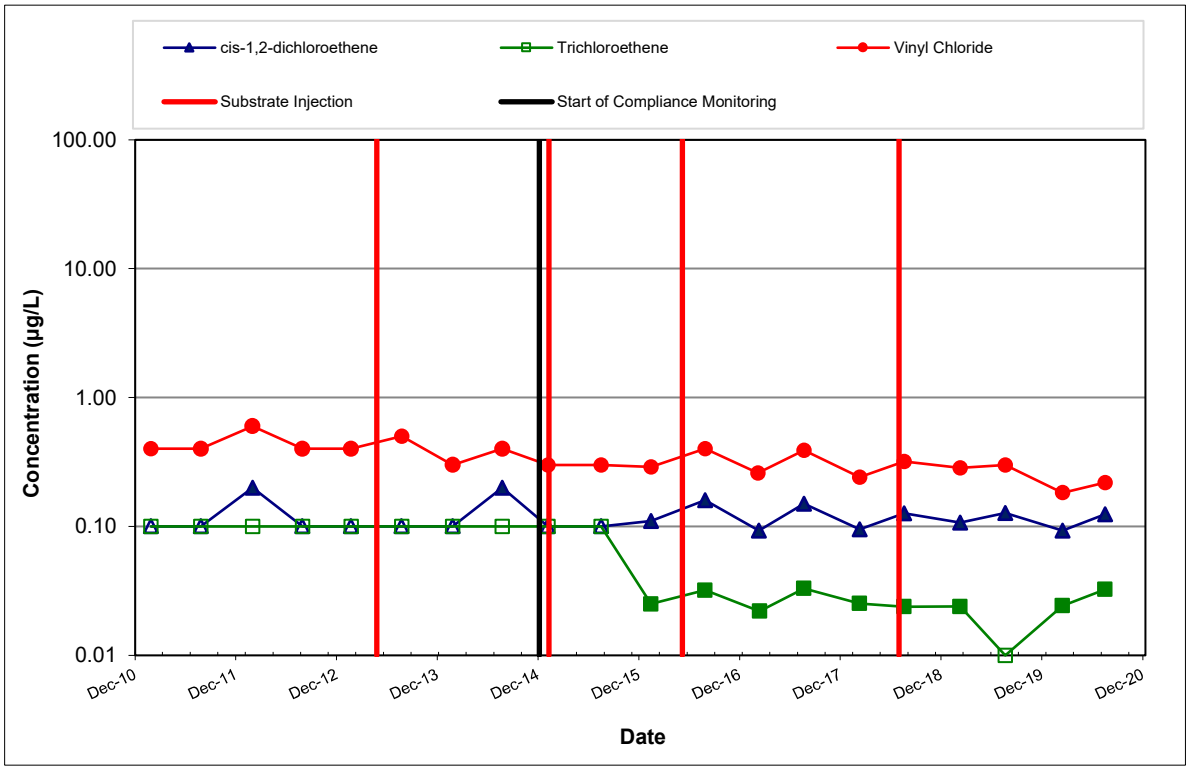
N

0 20 40
APPROXIMATE SCALE IN FEET

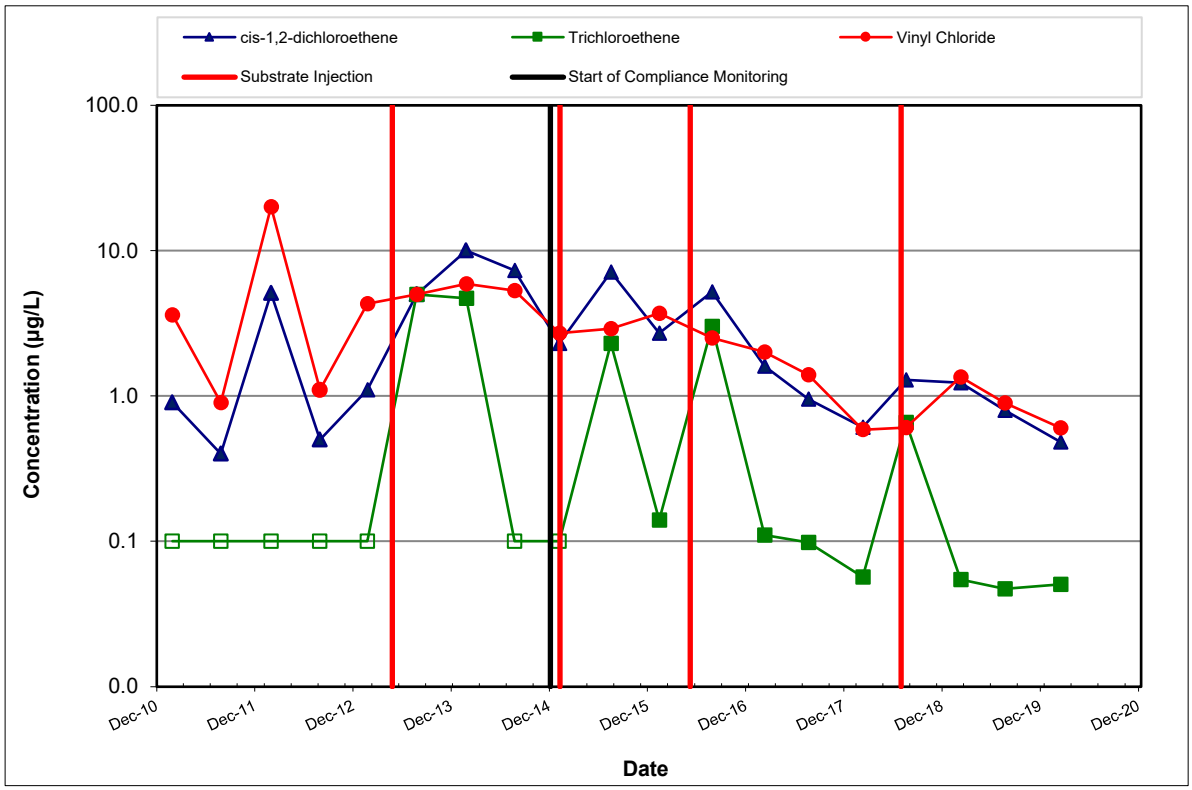
AOC-060
MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS
AUGUST 11, 2020
Boeing Renton Facility
Renton, Washington

By: APS	Date: 10/29/20	Project No. PS20203450
wood.		Figure 26

Plot Date: 10/29/20 - 11:15am Plotted by: adam.stenberg
Drawing Path: S:\8888_20061\05_3420_GW-MR_Drawing Name: Figure_26_AOC-060_GW-ELEV_3Q20.dwg



SOURCE AREA WELL GW009S

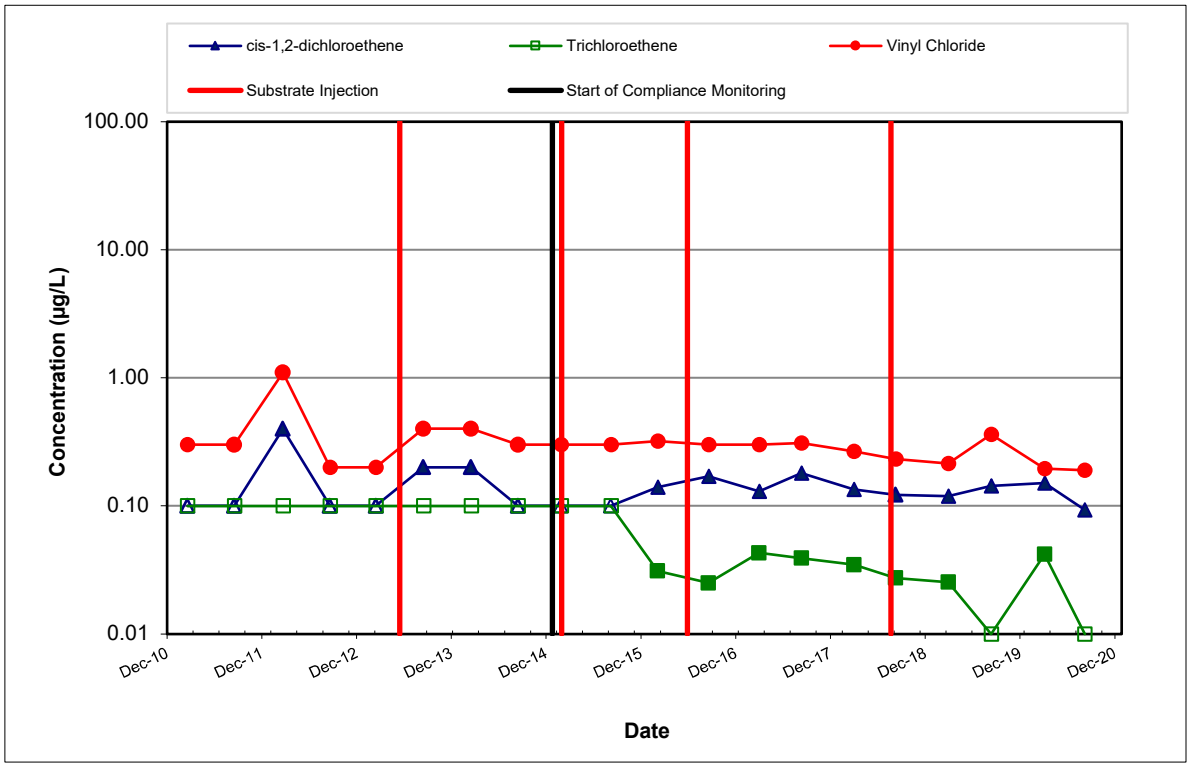


DOWNGRADIENT PLUME AREA WELL GW012S

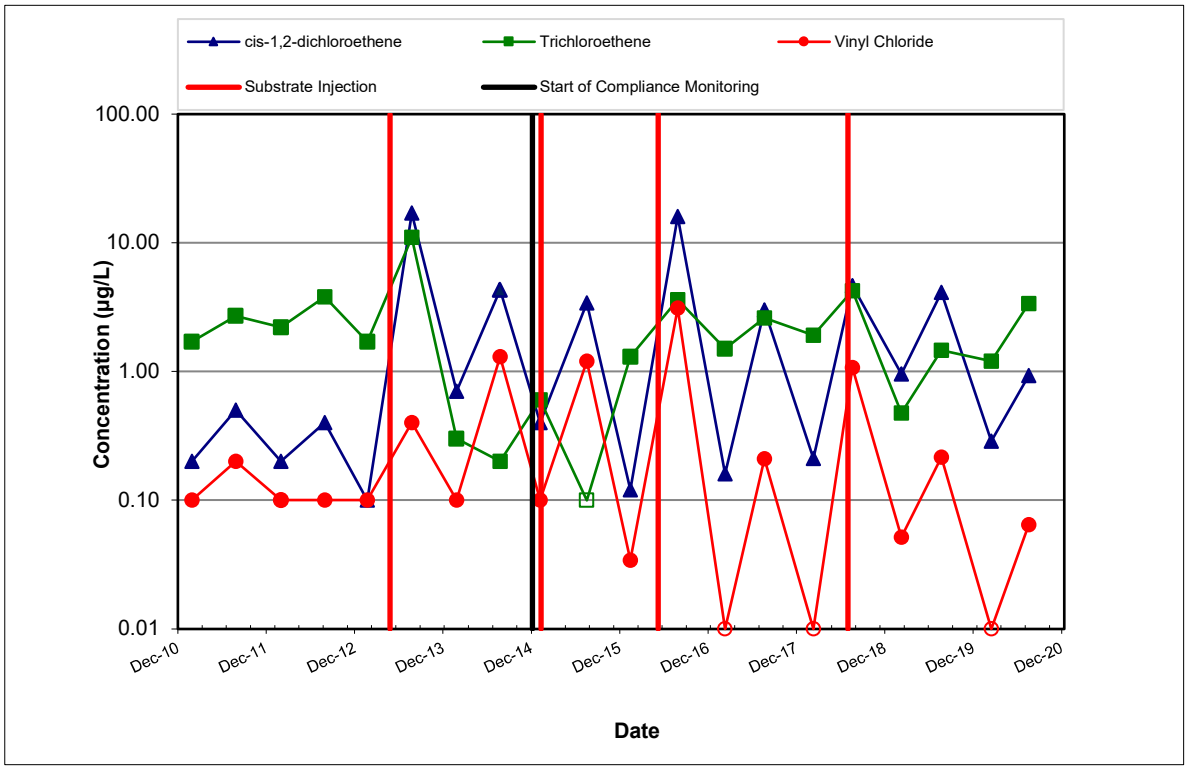
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol. August 2013 reporting limits elevated.

wood.	AOC-060 TREND PLOTS FOR SOURCE AREA WELL GW009S AND DOWNGRADIENT PLUME AREA WELL GW012S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 27

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 27 to 29 AOC 60.xlsx



DOWNGRADIENT PLUME AREA WELL GW014S

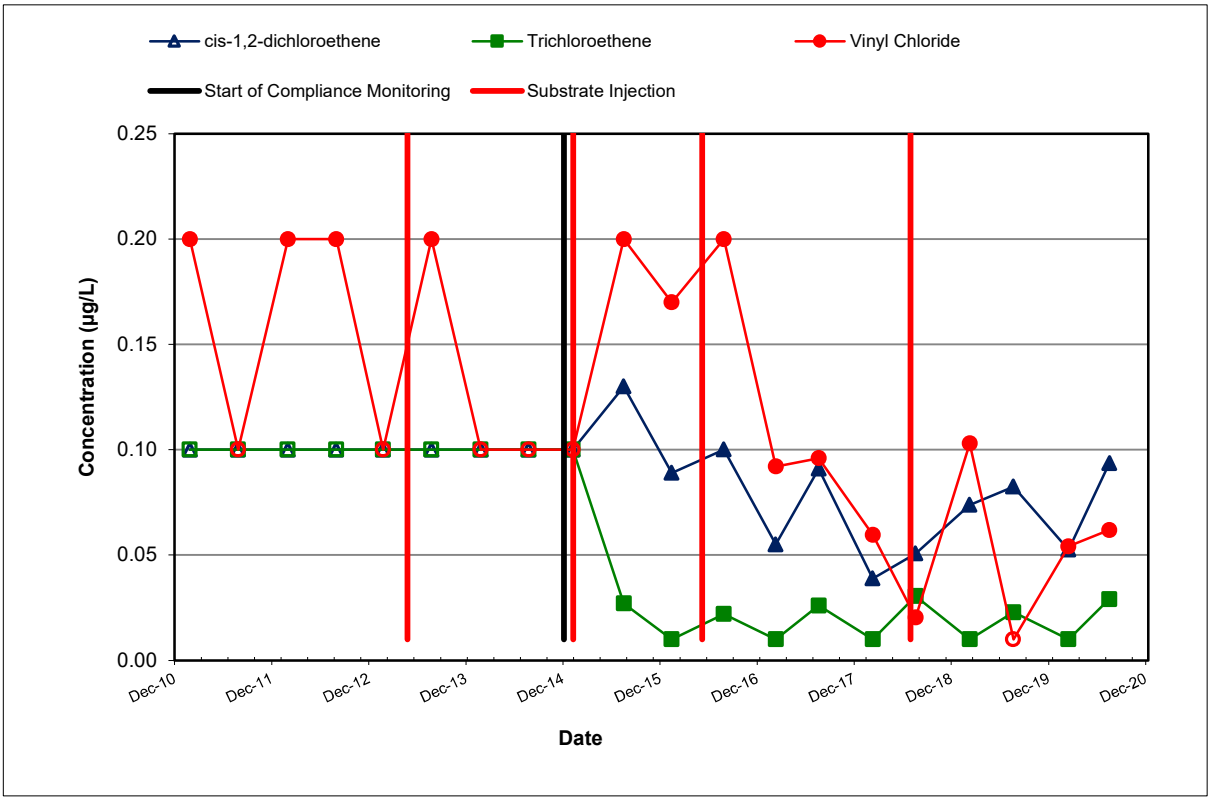


DOWNGRADIENT PLUME AREA WELL GW147S

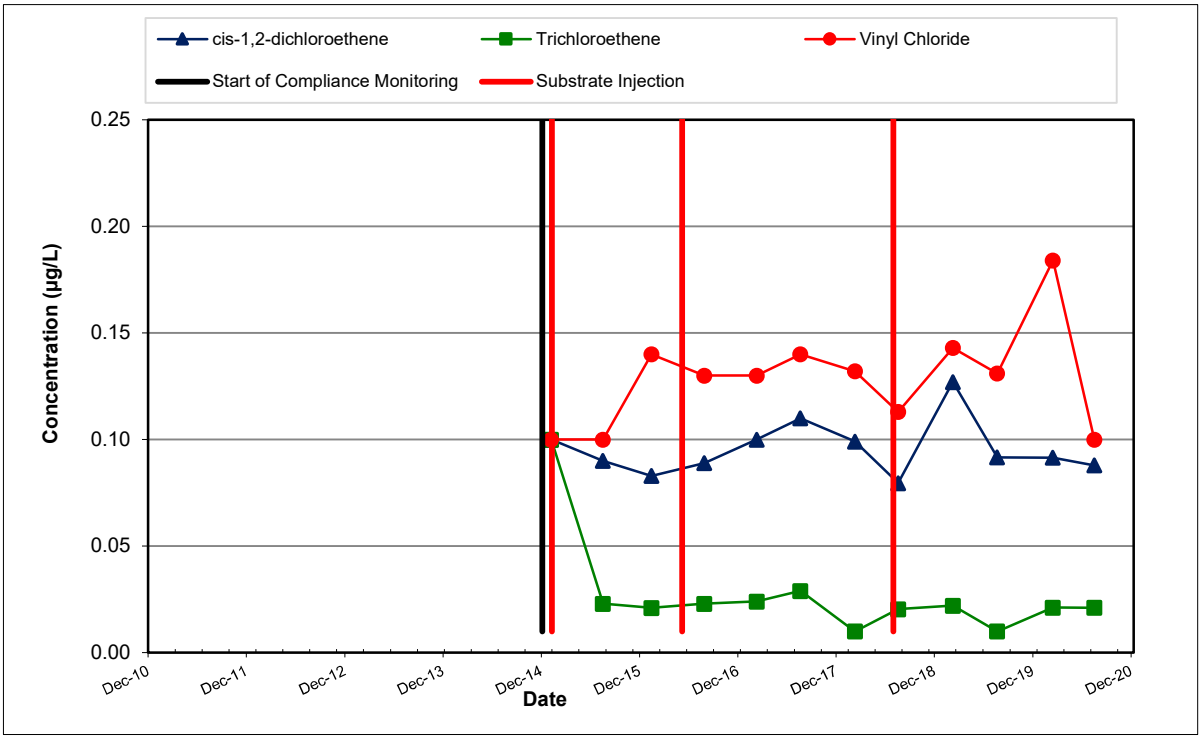
Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	AOC-060 TREND PLOTS FOR DOWNGRADIENT PLUME AREA WELLS GW014S AND GW147S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 28

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 27 to 29 AOC 60.xlsx



CPOC AREA WELL GW150S

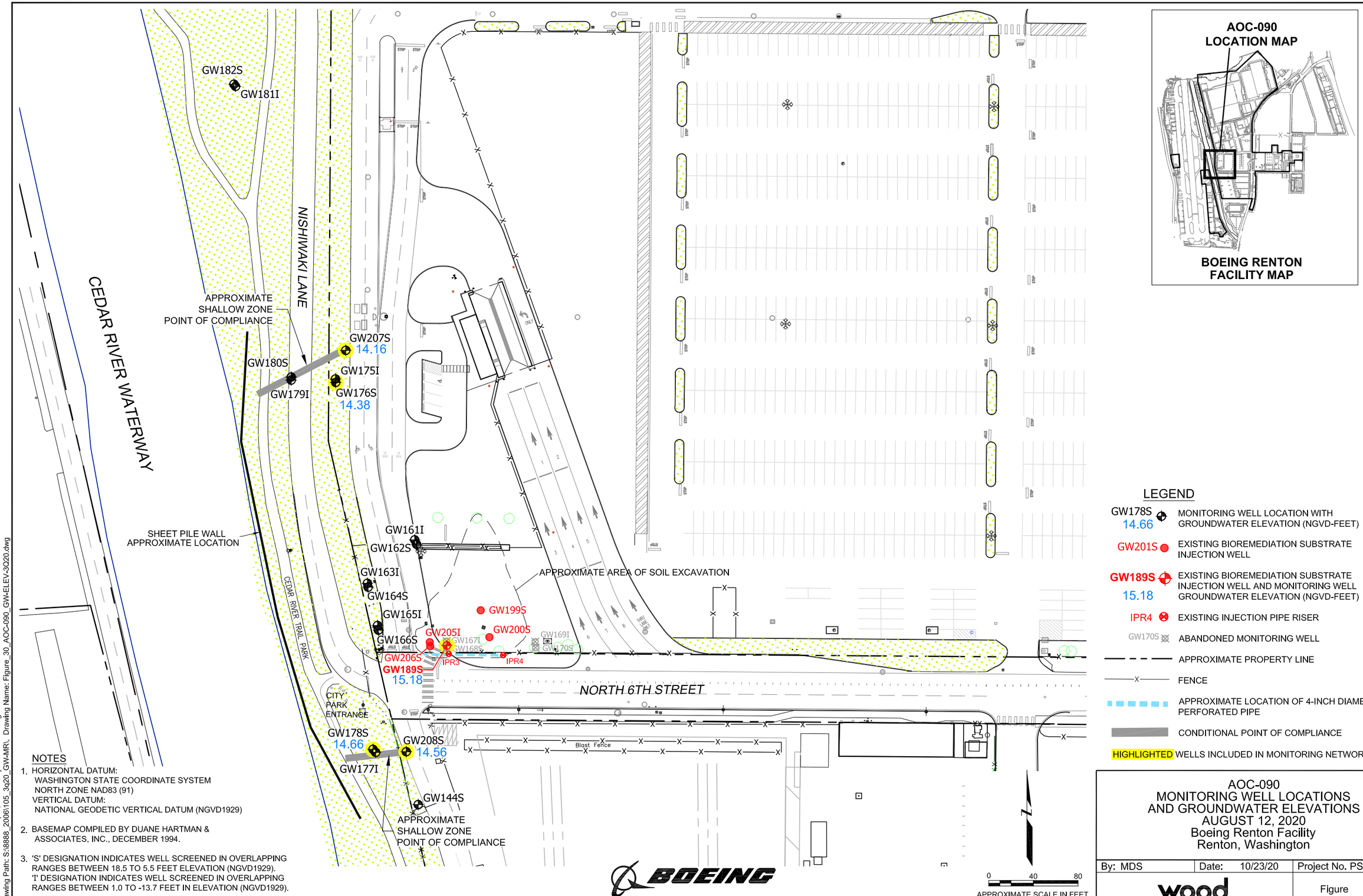


CPOC AREA WELL GW253I

Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

wood.	AOC-060 TREND PLOTS FOR CPOC AREA WELLS GW150S AND GW253I Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 29

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 27 to 29 AOC 60.xlsx



AOC-090
LOCATION MAP

BOEING RENTON
FACILITY MAP

LEGEND

- GW178S 14.66 — MONITORING WELL LOCATION WITH GROUNDWATER ELEVATION (NGVD-FEET)
- GW201S — EXISTING BIOREMEDIATION SUBSTRATE INJECTION WELL
- GW189S 15.18 — EXISTING BIOREMEDIATION SUBSTRATE INJECTION WELL AND MONITORING WELL GROUNDWATER ELEVATION (NGVD-FEET)
- IPR4 — EXISTING INJECTION PIPE RISER
- GW170S — ABANDONED MONITORING WELL
- APPROXIMATE PROPERTY LINE
- FENCE
- APPROXIMATE LOCATION OF 4-INCH DIAMETER PERFORATED PIPE
- CONDITIONAL POINT OF COMPLIANCE
- HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK

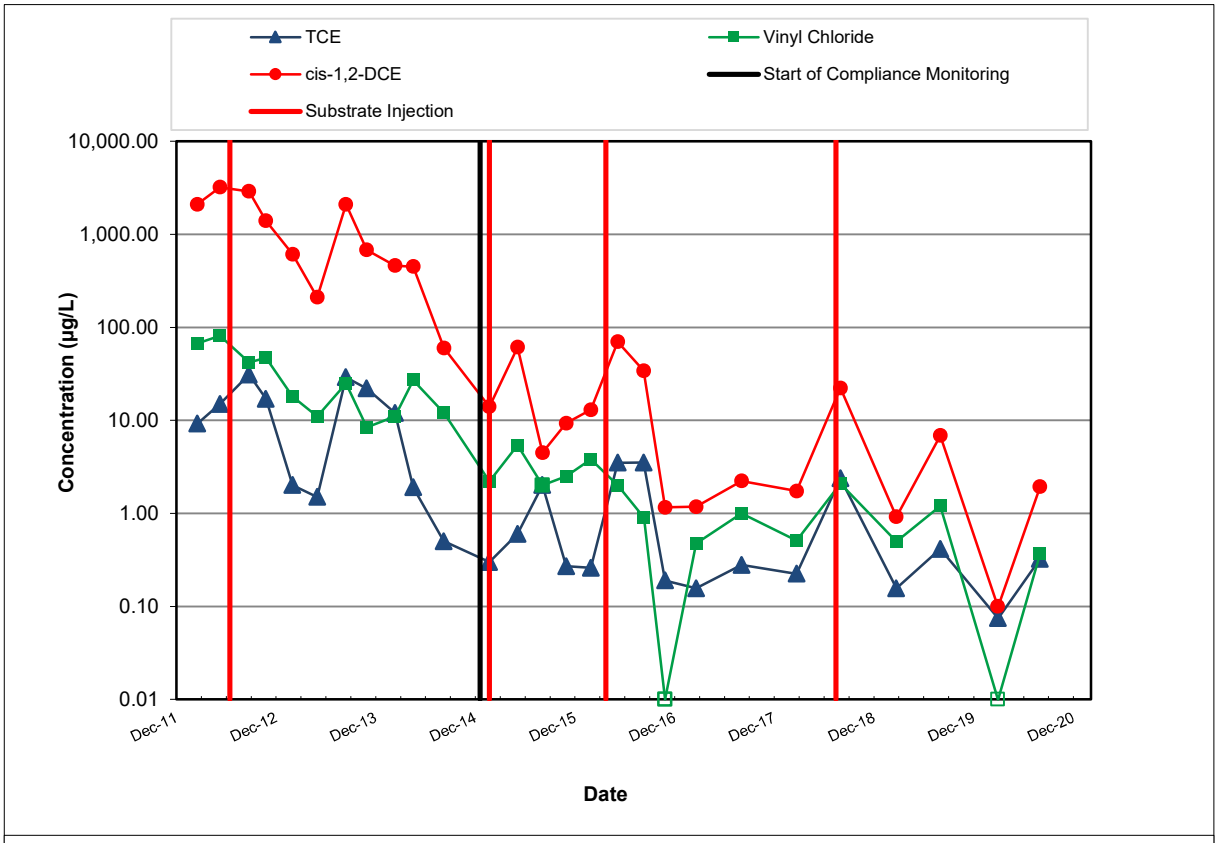
NOTES

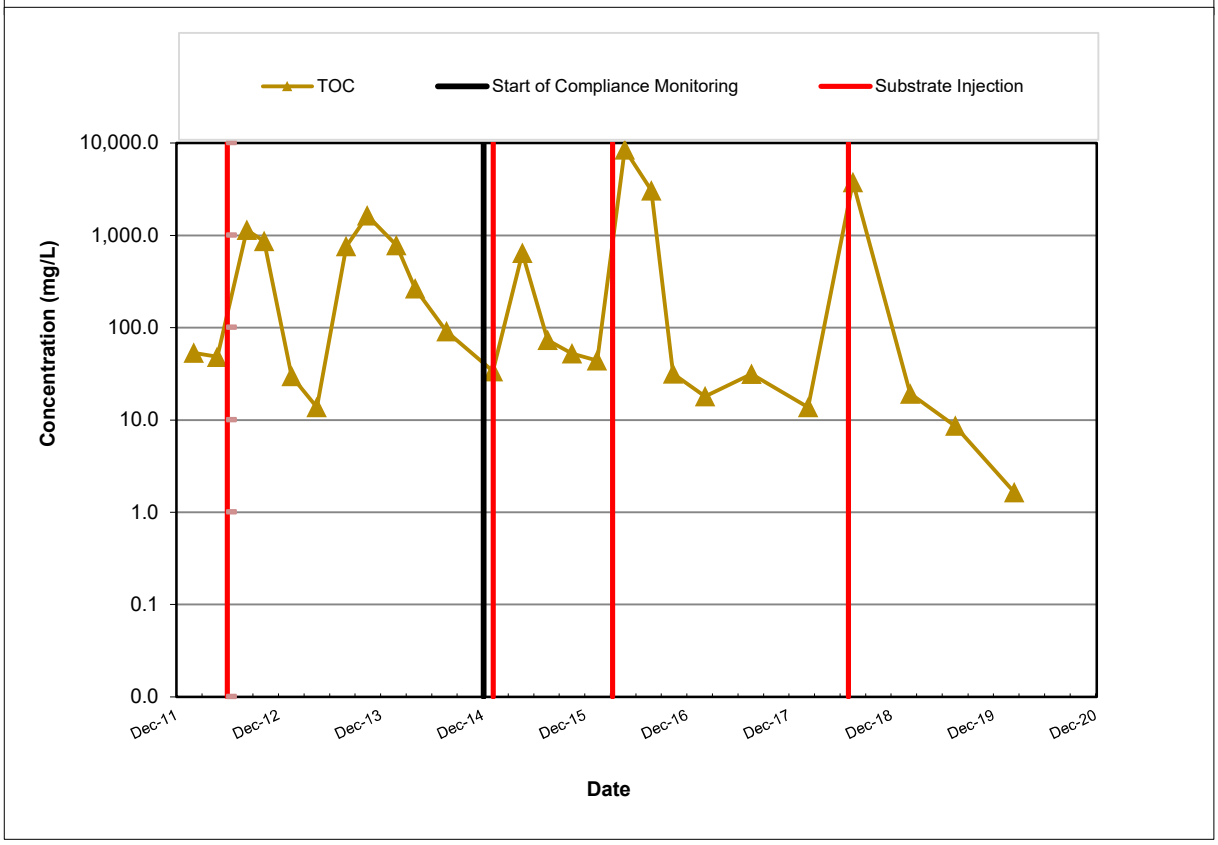
1. HORIZONTAL DATUM:
   WASHINGTON STATE COORDINATE SYSTEM
   NORTH ZONE NAD83 (91)
   VERTICAL DATUM:
   NATIONAL GEODETIC VERTICAL DATUM (NGVD1929)
2. BASEMAP COMPILED BY DUANE HARTMAN & ASSOCIATES, INC., DECEMBER 1994.
3. 'S' DESIGNATION INDICATES WELL SCREENED IN OVERLAPPING RANGES BETWEEN 18.5 TO 5.5 FEET ELEVATION (NGVD1929).
   'I' DESIGNATION INDICATES WELL SCREENED IN OVERLAPPING RANGES BETWEEN 1.0 TO -13.7 FEET IN ELEVATION (NGVD1929).

AOC-090
MONITORING WELL LOCATIONS AND GROUNDWATER ELEVATIONS
AUGUST 12, 2020
Boeing Renton Facility
Renton, Washington

By: MDS	Date: 10/23/20	Project No. PS20203450
wood.		Figure 30

Plot Date: 10/23/20 - 1:23pm, Plotted by: adam.stenberg
Drawing Path: S:\6888_2006\105_3420_GW-MR\, Drawing Name: Figure_30_AOC-090_GW-ELEV-3Q20.dwg





Note: non-detected values shown at one-half the reporting limit and graphed with an open symbol.

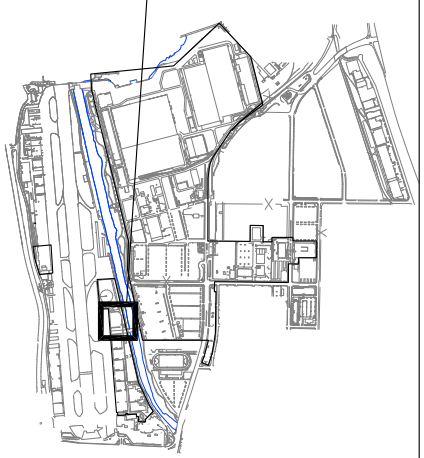
wood.	AOC-090 TREND PLOTS FOR SOURCE AREA WELL GW189S Boeing Renton Facility Renton, Washington	Project No. 8888 Figure 31

\\sea2-fs1\projects\8888 - Boeing Renton\02 Data Management\Grapher and Excel Figure Files\excel\Figure 31 AOC-90 Trend Plots.xls

Plot Date: 10/29/20 - 11:17am, Plotted by: adam.stenberg
Drawing Path: S:\8888_2006\105_3q20_GW-MR\, Drawing Name: Figure_32_APRON A_GW-ELEV_3Q20.dwg

B-4
B-3
B-6
SHED
SHED
SHED
SHED
SHED
CB
CEDAR RIVER WATERWAY
EAST PERIMETER ROAD
B-10
B-12
B-2
B-9
B-8
SHED
B-17
B-7
CB
B-1
B-16
BUILDING
B-13
B-14
B-15
GW262S
GW265S
GW264S
5.67' DTW
GW263S
6.18' DTW
APPROXIMATE AREA
OF TRENCH INJECTION

APRON A
LOCATION MAP



BOEING RENTON
FACILITY MAP

LEGEND

GW264S 6.18' DTW — MONITORING WELL LOCATION WITH DEPTH TO WATER (BGS IN FEET)

GENERAL DIRECTION OF GROUNDWATER FLOW

B-1 — SOIL SAMPLE LOCATION

APPROXIMATE PROPERTY LINE

FENCE

HIGHLIGHTED WELLS INCLUDED IN MONITORING NETWORK

NOTES

1. 'S' DESIGNATION INDICATES WELL SCREENED LESS THAN 10 FEET IN DEPTH.
2. THE GROUNDWATER FLOW DIRECTION SHOWN IS BASED ON HISTORICAL GROUNDWATER DATA.

N

0 20 40
APPROXIMATE SCALE IN FEET

BOEING

APRON A AREA
MONITORING WELL LOCATIONS AND DEPTH TO GROUNDWATER
AUGUST 10, 2020
Boeing Renton Facility
Renton, Washington

By: APS	Date: 10/29/20	Project No. PS20203450
wood.		Figure 32

Tables

TABLE 1: SWMU-168 GROUNDWATER ELEVATION DATA
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW230I	4 to 14	24.86	7.62	17.24

Notes:
1. I = intermediate well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
bgs = below ground surface
SWMU = solid waste management unit
TOC = top of casing

TABLE 2: SWMU-168 PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID [2] CPOC Area GW230I
Temperature (degrees C)	26.8
Specific Conductivity (µS/cm)	440.6
Dissolved Oxygen (mg/L)	0.36
pH (standard units)	6.27
Oxidation/Reduction Potential (mV)	54.7

Notes:
1. Primary geochemical indicators are measured in the field.
2. I = intermediate well.

Abbreviations:
µS/cm = microsiemens per centimeter
CPOC = conditional point of compliance
degrees C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts
SWMU = solid waste management unit

TABLE 3: SWMU-168 CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Analyte		Cleanup Level [3]	Well ID [2] CPOC Area GW230I
Volatile Organic Compounds (µg/L)			
Vinyl Chloride		0.11	**0.162**

Notes:
1. **Bolded** values exceed the cleanup levels.
2. I = intermediate well.
3. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.

Abbreviations:
µg/L = micrograms per liter
CPOC = conditional point of compliance
SWMU = solid waste management unit

TABLE 4: SWMU-172 AND SWMU-174 GROUP GROUNDWATER ELEVATION DATA
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)[2]	TOC Elevation (feet)[3]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[3]
GW152S	5 to 20[2]	26.98	9.57	17.41
GW153S	5 to 20[2]	27.47	9.95	17.52
GW172S	8 to 18[2]	26.44	9.55	16.89
GW173S	8 to 18[2]	26.51	9.62	16.89
GW226S	5 to 20[2]	26.86	9.33	17.53
GW232S	4 to 14	24.45	7.58	16.87
GW234S	3 to 13	24.95	8.20	16.75
GW235I	15 to 25	24.9	7.67	17.23
GW236S	5 to 15	24.36	7.48	16.88

Notes:
1. S = shallow well; I = intermediate well.
2. Screen intervals are approximate and based on database listings of the screen interval depths for these wells.
3. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
bgs = below ground surface
SWMU = solid waste management unit
TOC = top of casing

TABLE 5: SWMU-172 AND SWMU-174 GROUP PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID[2]									
	Source Area						CPOC Area			
	GW152S	GW152S (field dup.)	GW153S	GW172S	GW173S	GW226S	GW232S	GW234S	GW235I	GW236S
Temperature (degrees C)	21.8	NA	22.7	24.6	25.2	26.9	21.5	23.0	21.6	21.1
Specific Conductivity (µS/cm)	296.2	NA	263.7	352.5	439.6	364.5	596.0	331.4	170.8	329.0
Dissolved Oxygen (mg/L)	1.04	NA	1.27	0.49	0.70	0.47	1.87	1.13	0.96	3.02
pH (standard units)	6.15	NA	6.45	6.48	6.43	6.46	6.24	6.28	6.16	6.34
Oxidation/Reduction Potential (mV)	-13.8	NA	-7.6	-22.8	-10.5	-29.8	-27.9	-1.9	10.2	13.5
Total Organic Carbon (mg/L)	6.76	5.59	7.05	5.74	4.87	10.31	6.75	3.26	0.89	5.31

Notes
1. Primary geochemical indicators are measured in the field, with the exception of total organic carbon, which is measured in the laboratory.
2. S = shallow well; I = intermediate well.

Abbreviations
µS/cm = microsiemens per centimeter
CPOC = conditional point of compliance
degrees C = degrees Celsius
field dup. = field duplicate
mg/L = milligrams per liter
mV = millivolts
NA = not analyzed
SWMU = solid waste management unit

TABLE 6: SWMU-172 AND SWMU-174 GROUP CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1,2]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Analyte	Cleanup Level [4]	Well ID [3]									
		Source Area			Downgradient Plume Area			CPOC Area			
		GW152S	GW152S (field dup.)	GW153S	GW172S	GW173S	GW226S	GW232S	GW234S	GW235I	GW236S
Volatile Organic Compounds (µg/L)											
cis -1,2-Dichloroethene	0.03	**1.66**	**1.74**	**0.0551**	**0.0561**	**0.0313**	0.0218	**0.482**	**0.0914**	**0.104**	**0.0881**
Tetrachloroethene	0.02	**0.319**	**0.296**	0.020 U	**0.0603**	0.020 U	**0.0279**	0.020 U	0.020 U	0.020 U	0.020 U
Trichloroethene	0.02	**0.579**	**0.575**	0.020 U	0.020 U	**0.0239**	0.020 U	0.020 U	0.020 U	**0.0227**	0.020 U
Vinyl Chloride	0.11	**0.284**	**0.299**	**0.135**	0.0628	0.0455	0.0415	**0.425**	0.0279	0.020 U	0.020 U
Total Metals (µg/L)											
Arsenic	1.0	**6.72**	**7.07**	**4.05**	**10.8**	**7.00**	**4.93**	**3.83**	**3.26**	0.288	**10.1**
Copper	3.5	**7.45 J**	**10.3 J**	1.68	**6.12**	3.19	1.48	0.627	3.21	1.30	**10.8**
Lead	1.0	**3.89**	**4.77**	0.326	**2.58**	0.470	0.136	0.100 U	**1.25**	0.304	**10.8**

Notes:
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = the value is estimated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.

Abbreviations:
µg/L = micrograms per liter
CPOC = conditional point of compliance
field dup. = field duplicate
SWMU = solid waste management unit

TABLE 8: BUILDING 4-78/79 SWMU/AOC GROUP PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID[2]							
	Source Area					CPOC Area		
	GW031S	GW031S (field dup.)	GW033S	GW034S	GW244S	GW143S	GW237S	GW240D
Temperature (degrees C)	22.5	NA	23.0	22.5	23.6	19.4	19.9	18.2
Specific Conductivity (µS/cm)	487.0	NA	416.9	317.0	419.3	323.4	394.4	361.9
Dissolved Oxygen (mg/L)	0.55	NA	0.55	0.47	0.42	1.52	0.92	1.16
pH (standard units)	6.24	NA	6.19	6.35	6.16	6.10	6.30	5.97
Oxidation/Reduction Potential (mV)	-19.0	NA	-32.7	-43.1	-13.9	-23.6	-22.4	-24.7
Total Organic Carbon (mg/L)	12.05	13.30	12.69	6.46	12.89	7.42	8.03	7.04

Notes
1. Primary geochemical indicators are measured in the field, with the exception of total organic carbon, which is measured in the laboratory.
2. S = shallow well; D = deep well.

Abbreviations
µS/cm = microsiemens per centimeter
AOC = area of concern
CPOC = conditional point of compliance
degrees C = degrees Celsius
field dup. = field duplicate
mg/L = milligrams per liter
mV = millivolts
NA = not analyzed
SWMU = solid waste management unit

TABLE 7: BUILDING 4-78/79 SWMU/AOC GROUP GROUNDWATER ELEVATION DATA
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW031S	5 to 25	19.44	4.76	14.68
GW033S	5 to 25	19.49	4.88	14.61
GW034S	5 to 25	19.65	4.98	14.42
GW143S	10 to 15	19.81	5.21	14.60
GW237S	5 to 15	18.85	4.27	14.58
GW240D	22 to 27	19.81	5.50	14.31
GW244S	5 to 15	19.53	4.88	14.65

Notes:
1. S = shallow well; D = deep well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
AOC = area of concern
bgs = below ground surface
SWMU = solid waste management unit
TOC = top of casing

TABLE 9: BUILDING 4-78/79 SWMU/AOC GROUP CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Analyte	Cleanup Level [4]	Well ID [3]							
		Source Area					CPOC Area		
		GW031S	GW031S (field dup.)	GW033S	GW034S	GW244S	GW143S	GW237S	GW240D
Volatile Organic Compounds (µg/L)									
Benzene	0.80	**1.72 J**	**2.05 J**	**12.5**	0.20 U	0.43	0.20 U	0.24	0.20 U
cis -1,2-Dichloroethene	0.70	0.67 J	0.52 J	**188**	0.20 U	**1.12**	**1.17**	0.20 U	0.20 U
Trichloroethene	0.23	0.20 UJ	0.20 UJ	**0.25**	0.20 U	0.20 U	0.23	0.20 U	0.20 U
Vinyl Chloride	0.20	**0.32 J**	**0.25 J**	**310**	**0.41**	**0.98**	0.20 U	0.20 U	0.20 U
Total Petroleum Hydrocarbons (µg/L)									
TPH-G (C7-C12)	800	**1,160**	**1,180**	255	100 U	100 U	100 U	100 U	100 U

Notes:
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = the value is estimated.
   UJ = The analyte was not detected at the estimated reporting limit indicated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; D = deep well.
4. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.

Abbreviations:
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
field dup. = field duplicate
SWMU = solid waste management unit
TPH-G = total petroleum hydrocarbons in gasoline range

TABLE 11: FORMER FUEL FARM PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID[2]			
	CPOC Area			
	GW211S	GW221S	GW224S	GW224S (field dup.)
Temperature (degrees C)	20.2	25.9	23.5	NA
Specific Conductivity (µS/cm)	257.1	275.3	190.2	NA
Dissolved Oxygen (mg/L)	0.74	0.69	0.43	NA
pH (standard units)	6.08	6.10	5.88	NA
Oxidation/Reduction Potential (mV)	75.2	77.8	91.3	NA

Notes
1. Primary geochemical indicators are measured in the field.
2. S = shallow well.

Abbreviations
µS/cm = microsiemens per centimeter
CPOC = conditional point of compliance
degrees C = degrees Celsius
field dup. = field duplicate
mg/L = milligrams per liter
mV = millivolts
NA = not analyzed

TABLE 10: FORMER FUEL FARM GROUNDWATER ELEVATION DATA
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW211S	4.8 to 14.7	27.77	8.50	19.27
GW221S	5 to 15	27.93	10.52	17.41
GW224S	5 to 15	27.98	11.03	16.95

Notes
1. S = shallow well
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations
bgs = below ground surface
TOC = top of casing

TABLE 12: FORMER FUEL FARM CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]

AUGUST 10, 2020

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID[3]			
		CPOC Area			
		GW211S	GW221S	GW224S	GW224S (field dup.)
Total Petroleum Hydrocarbons (mg/L)					
TPH-D (C12-C24)	0.5	0.192	**7.67**	**1.08**	**0.948**
TPH-O (C24-C38)	NC	0.200 U	0.200 U	0.200 U	0.200 U
Jet A (C10-C18)	0.5	0.155	**5.70**	**1.42**	**1.30**

Notes

1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
2. **Bolded** values exceed the current cleanup levels.
3. S = shallow well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations

CPOC = conditional point of compliance
field dup. = field duplicate
mg/L = milligrams per liter
NC = No cleanup level established
TPH-D = total petroleum hydrocarbons as diesel
TPH-O = total petroleum hydrocarbons as motor oil

TABLE 13: AOC-003 GROUNDWATER ELEVATION DATA
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW188S	3.5 to 13.5	18.78	3.86	14.92
GW247S	4 to 14	18.91	3.92	14.99
GW248I	10 to 20	18.78	3.61	15.17
GW249S	4 to 14	18.85	3.60	14.85

Notes:
1. S = shallow well; I = intermediate well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
AOC = area of concern
bgs = below ground surface
TOC = top of casing

TABLE 14: AOC-003
PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID[2]			
	Source Area	Downgradient Plume Area	CPOC Area	
	RGW249S	RGW188S	GW247S	GW248I
Temperature (degrees C)	26.9	25.5	29.2	29.0
Specific Conductivity (µS/cm)	497.9	593	586	685
Dissolved Oxygen (mg/L)	0.47	0.50	0.46	0.51
pH (standard units)	6.32	6.23	6.36	6.31
Oxidation/Reduction Potential (mV)	-48.4	27.1	33.9	10.6

Notes
1. Primary geochemical indicators are measured in the field.
2. S = shallow well; I = intermediate well.

Abbreviations
µS/cm = microsiemens per centimeter
AOC = area of concern
CPOC = conditional point of compliance
degrees C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts

TABLE 15: AOC-003 CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Analyte		Cleanup Level [3]	Well ID [2]			
			Source Area	Downgradient Plume Area	CPOC Area	
			GW249S	GW188S	GW247S	GW248I
Volatile Organic Compounds (µg/L)						
Vinyl Chloride		0.24	**0.261**	**0.288**	**0.392**	**0.383**

Notes:
1. **Bolded** values exceed the cleanup levels.
2. S = shallow well; I = intermediate well.
3. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.

Abbreviations:
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance

TABLE 16: AOC-004 GROUNDWATER ELEVATION DATA
AUGUST 12, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW250S	4 to 14	19.31	3.63	15.68

Notes:
1. S = shallow well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
AOC = area of concern
bgs = below ground surface
TOC = top of casing

TABLE 17: AOC-004 PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 12, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID [2] Source Area GW250S
Temperature (degrees C)	19.3
Specific Conductivity (µS/cm)	129.3
Dissolved Oxygen (mg/L)	0.76
pH (standard units)	6.66
Oxidation/Reduction Potential (mV)	57.7

Notes:
1. Primary geochemical indicators are measured in the field.
2. S = shallow well.

Abbreviations:
µS/cm = microsiemens per centimeter
AOC = area of concern
degrees C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts

TABLE 18: AOC-004 CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1]

AUGUST 12, 2020

Boeing Renton Facility, Renton, Washington

Analyte	Cleanup Level [3]	Well ID [2] Source Area GW250S
Metals (mg/L)		
Lead	0.001	0.000611

Notes:

1. **Bolded** values exceed the cleanup levels.
2. S = shallow well.
3. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.

Abbreviations:

AOC = area of concern

mg/L = milligrams per liter

TABLE 19: AOC-060 GROUNDWATER ELEVATION DATA
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW009S	4.5 to 14.5	19.36	4.73	14.63
GW010S	4.5 to 14.5	19.47	4.87	14.60
GW011D	29 to 39	19.49	4.88	14.61
GW012S	4.5 to 14.5	19.11	4.52	14.59
GW014S	4.5 to 14.5	19.24	4.56	14.68
GW147S	5 to 15	18.73	4.17	14.56
GW150S	5 to 15	19.1	4.58	14.52
GW253I	10 to 20	19.02	4.48	14.54

Notes:
1. S = shallow well; D = deep well; I = intermediate well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
AOC = area of concern
bgs = below ground surface
TOC = top of casing

TABLE 20: AOC-060 PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID [2]						
	Source Area	Downgradient Plume Area				CPOC Area	
	GW009S	GW012S	GW014S	GW014S (field dup.)	GW147S	GW150S	GW253I
Temperature (degrees C)	21.0	22.3	21.3	NA	22.2	21.7	21.6
Specific Conductivity (µS/cm)	385.3	525	446.3	NA	67.5	383.0	393.2
Dissolved Oxygen (mg/L)	0.40	1.24	1.14	NA	0.48	0.33	0.23
pH (standard units)	6.20	5.93	6.14	NA	5.57	6.27	6.39
Oxidation/Reduction Potential (mV)	79.8	92.6	91.5	NA	124.9	78.7	66.4
Total Organic Carbon (mg/L)	5.73	8.70	4.39	4.43	2.76	5.50	7.78

Notes: 2.76 8.70

1. Primary geochemical indicators are measured in the field, with the exception of total organic carbon, which is measured in the laboratory.
2. S = shallow well; I = intermediate well.

Abbreviations:

µS/cm = microsiemens per centimeter
AOC = area of concern
CPOC = conditional point of compliance
degrees C = degrees Celsius
field dup. = field duplicate
mg/L = milligrams per liter
mV = millivolts
NA = not analyzed

TABLE 21: AOC-060 CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]
AUGUST 11, 2020
Boeing Renton Facility, Renton, Washington

Analyte	Cleanup Levels [4]	Well ID [3]						
		Source Area	Downgradient Plume Area				CPOC Area	
		GW009S	GW012S	GW014S	GW014S (field dup.)	GW147S	GW150S	GW253I
Volatile Organic Compounds (µg/L)								
cis -1,2-Dichloroethene	0.08	**0.124**	**0.508**	**0.0932**	**0.0908**	**0.931**	**0.0935**	**0.0879**
Trichloroethene	0.02	**0.0324**	**0.0518**	0.020 U	0.020 U	**3.37**	**0.0291**	**0.0211**
Vinyl Chloride	0.26	0.219	**0.387**	0.190	0.191	0.0643	0.0619	0.100

Notes:
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.

Abbreviations:
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
field dup. = field duplicate

TABLE 22: AOC-090 GROUNDWATER ELEVATION DATA
AUGUST 12, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW176S	10 to 14.3	20.15	5.77	14.38
GW178S	11.2 to 15.5	22.73	8.07	14.66
GW189S	4 to 14	22.01	6.83	15.18
GW207S	7.3 to 12	21.12	6.96	14.16
GW208S	6.3 to 11	22.45	7.89	14.56

Notes:
1. S = shallow well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations:
AOC = area of concern
bgs = below ground surface
TOC = top of casing

TABLE 23: AOC-090 PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 12, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID [2]				
	Source Area	Downgradient Plume Area	Shallow Zone CPOC Area		
	GW189S [3]	GW176S	GW178S	GW207S	GW208S
Temperature (degrees C)	16.8	17.7	16.1	16.6	17.7
Specific Conductivity (µS/cm)	274.9	592.0	422.3	395.6	468.5
Dissolved Oxygen (mg/L)	1.48	0.81	0.71	0.56	0.87
pH (standard units)	5.99	6.17	6.07	6.10	6.09
Oxidation/Reduction Potential (mV)	100.6	82.1	82.4	97.6	68.9

Notes:
1. Primary geochemical indicators are measured in the field.
2. S = shallow well.
3. GW189S is the replacement well for GW168S.

Abbreviations:
µS/cm = microsiemens per centimeter
AOC = area of concern
CPOC = conditional point of compliance
degrees C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts

TABLE 24: AOC-090 CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]
AUGUST 12, 2020
Boeing Renton Facility, Renton, Washington

Analyte	Cleanup Levels [4]	Well ID [3]				
		Source Area	Downgradient Plume Area	Shallow Zone CPOC Area		
		GW189S [5]	GW176S	GW178S	GW207S	GW208S
Volatile Organic Compounds (µg/L)						
1,1,2,2-Tetrachloroethane	0.17	0.020 U	NA	NA	NA	NA
1,1,2-Trichloroethane	0.2	0.20 U	NA	NA	NA	NA
1,1-Dichloroethene	0.057	0.0529	NA	NA	NA	NA
Acetone	300	5.00 U	NA	NA	NA	NA
Benzene	0.8	0.20 U	NA	NA	NA	NA
Carbon Tetrachloride	0.23	0.20 U	NA	NA	NA	NA
Chloroform	2	0.20 U	NA	NA	NA	NA
cis-1,2-Dichloroethene	2.4	1.93	NA	NA	NA	NA
Methylene Chloride	2	1.00 U	NA	NA	NA	NA
Tetrachloroethene	0.05	0.020 U	NA	NA	NA	NA
Toluene	75	1.05	NA	NA	NA	NA
trans-1,2-Dichloroethene	53.9	0.20 U	NA	NA	NA	NA
Trichloroethene	0.08	**0.324**	NA	NA	NA	NA
Vinyl Chloride	0.13	**0.369**	**0.232**	**0.141**	**0.377**	**0.343**
Total Petroleum Hydrocarbons (µg/L)						
TPH-G (C7-C12)	800	699	NA	NA	NA	NA
TPH-D (C12-C24)	500	150	NA	NA	NA	NA
TPH-O (C24-C40)	500	379	NA	NA	NA	NA

Notes:
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well.
4. Cleanup levels obtained from Table 2 of the Cleanup Action Plan.
5. GW189S is the replacement well for GW168S.

Abbreviations:
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
NA = not analyzed
TPH-G = total petroleum hydrocarbons in the gasoline range
TPH-D = total petroleum hydrocarbons in diesel range
TPH-O = total petroleum hydrocarbons in the motor oil range

TABLE 25: APRON A GROUNDWATER ELEVATION DATA
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Well ID[1]	Screen Interval Depth (feet bgs)	TOC Elevation (feet)[2]	Depth to Groundwater (feet below TOC)	Groundwater Elevation (feet)[2]
GW263S	8 to 18	NA	6.18	NA
GW264S	8 to 18	NA	5.67	NA

Notes
1. S = shallow well.
2. Elevations in feet relative to National Geodetic Vertical Datum of 1929.

Abbreviations
bgs = below ground surface
NA = not available
TOC = top of casing

TABLE 26: APRON A
PRIMARY GEOCHEMICAL INDICATORS [1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Parameter	Well ID[2] Source Area GW264S
Temperature (degrees C)	20.0
Specific Conductivity (µS/cm)	575.0
Dissolved Oxygen (mg/L)	0.87
pH (standard units)	5.96
Oxidation/Reduction Potential (mV)	92.7
Total Organic Carbon (mg/L)	26.62

Notes

1. Primary geochemical indicators are measured in the field.
2. S = shallow well.

Abbreviations
µS/cm = microsiemens per centimeter
degrees C = degrees Celsius
mg/L = milligrams per liter
mV = millivolts

TABLE 27: APRON A CONCENTRATIONS
OF CONSTITUENTS OF CONCERN[1]
AUGUST 10, 2020
Boeing Renton Facility, Renton, Washington

Analyte	Cleanup Levels	Well ID[2] GW264S
Volatile Organic Compounds (µg/L)		
cis- 1,2-Dichloroethene	NE	0.52
Vinyl Chloride	NE	0.20 U

Notes
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
2. S = shallow well.

Abbreviations
µg/L = micrograms per liter
NE = not established

Appendix A

TABLE A-1: GROUNDWATER COMPLIANCE MONITORING SCHEDULE

Boeing Renton Facility, Renton, Washington

Cleanup Action Area	Monitoring Wells [1,2]				Constituents of Concern[4]	Analyses[5]
	Source Area Wells	Downgradient Plume Wells	CPOC Wells	Additional Water Level Monitoring Wells [3]		
SWMU-168	NA	NA	GW230I	NA	VC	SW8260D SIM
SWMU-172/SWMU-174	GW152S and GW153S	GW172S, GW173S, and GW226S	GW232S, GW234S, GW235I, and GW236S	NA	*cis* -1,2-DCE, PCE, TCE, VC	SW8260D SIM[8]
					Arsenic, copper, and lead	EPA 6020A
Building 4-78/79 SWMU/AOC Group	GW031S, GW033S, GW034S, and GW244S	NA	GW143S, GW237S, and GW240D	NA	VC, TCE, *cis* -1,2-DCE, benzene	SW8260D
					TPH-gasoline	NWTPH-Gx
Former Fuel Farm SWMU/AOC Group	NA	NA	GW211S, GW221S, and GW224S	NA	TPH-jet fuel, TPH-diesel	NWTPH-Dx
AOC-001/AOC-002[6,7]	All wells closed with the start of Apron R construction.				Benzene	SW8260D
					TCE, *cis* -1,2-DCE, 1,1-dichloroethene, VC	SW8260D SIM[8]
AOC-003	GW249S	GW188S	GW247S and GW248I	NA	VC	SW8260D
AOC-004	GW250S	NA	NA	NA	Lead	EPA 6020A
AOC-060	GW009S	GW012S, GW014S, and GW147S	GW150S and GW253I	GW010S and GW011D	VC, TCE, cis-1,2-DCE	SW8260D SIM[8]
AOC-090[9]	GW189S	GW176S	GW178S, GW207S, and GW208S	NA	1,1,2-Trichloroethane, acetone, benzene, toluene, carbon tetrachloride, chloroform, *cis* -1,2-DCE, *trans* -1,2-DCE, methylene chloride	SW8260D
					1,1-Dichloroethene, 1,1,2,2-tetrachloroethane, VC, PCE, TCE	SW8260D SIM[8]
					TPH-gasoline	NWPTH-Gx
					TPH-diesel, TPH-motor oil	NWTPH-Dx
Apron A	GW264S	NA	NA	GW263S	*cis* -1,2-DCE and VC	SW8260D

Notes:

1. The EDR presents the groundwater monitoring frequency for each SWMU/AOC. All sites are monitored on a semi-annual basis with sampling events occurring in February and August.
2. Groundwater monitoring wells are also monitored for groundwater levels.
3. Additional wells are monitored for groundwater levels only.
4. In addition to COCs, primary geochemical indicators will be monitored during each regular monitoring event. Geochemical indicators are listed in Table A-2.
5. Details of analytical methods are specified in the Quality Assurance Project Plan, which is Appendix E to the Cleanup Action Plan (AMEC, 2012).
6. Monitoring wells were abandoned on 11/25/2019 prior to Apron R construction and will be replaced upon completion of construction.
7. Groundwater monitoring and sampling will be suspended until completion of construction.
8. SIM methods will be used if the cleanup level is lower than the reporting limit achieved by the conventional 8021, 8260, or 8270 method. If cleanup levels become higher or if the conventional 8021, 8260, or 8270 methods are updated and able to achieve reporting limits below the cleanup levels, then the conventional method rather than the SIM method will be used.
9. GW189S will be sampled for CVOCs and TPH, all other wells will only be sampled for VC.

Abbreviations:

AOC = area of concern
cis -1,2-DCE = *cis* -1,2 dichloroethene
COCs = constituents of concern
CPOC = conditional point of compliance
CVOCs = chlorinated volatile organic compounds
EDR = Engineering Design Report
EPA = United States Environmental Protection Agency
NA = not applicable
PCE = tetrachloroethene
SIM = selected ion monitoring
SWMU = solid waste management unit
TCE = trichloroethene
TPH = total petroleum hydrocarbons
trans -1,2-DCE = *trans* -1,2 dichloroethene
VC = vinyl chloride
VOCs = volatile organic compounds

TABLE A-2: MONITORED NATURAL ATTENUATION/MONITORED ATTENUATION SCHEDULE

Boeing Renton Facility, Renton, Washington

Cleanup Action Area	Groundwater Monitoring Wells				Primary Geochemical Parameters[2]
	Cross-Gradient Wells	Source Area Wells	Downgradient Plume Wells	CPOC Wells	Indicators
SWMU-168	NA	NA	NA	GW230I	Dissolved oxygen, pH, ORP, temperature, specific conductance
SWMU-172/SWMU-174	NA	GW152S and GW153S	GW172S, GW173S, and GW226S	GW232S, GW234S, GW235I, and GW236S	Dissolved oxygen, pH, ORP, temperature, specific conductance, TOC
Building 4-78/79 SWMU/AOC Group	NA	GW031S, GW033S, GW034S, and GW244S	NA	GW143S, GW237S, and GW240D	Dissolved oxygen, pH, ORP, temperature, specific conductance, TOC
Former Fuel Farm SWMU/AOC Group	NA	NA	NA	GW211S, GW221S, and GW224S	Dissolved oxygen, pH, ORP, temperature, specific conductance
AOC-001/AOC-002[3,4]	NA	All wells closed with the start of Apron R construction.			
AOC-003	NA	GW249S	GW188S	GW247S and GW248I	Dissolved oxygen, pH, ORP, temperature, specific conductance, TOC
AOC-004	NA	GW250S	NA	NA	Dissolved oxygen, pH, ORP, temperature, specific conductance
AOC-060	GW012S and GW014S	GW009S	GW147S	GW150S and GW253I	Dissolved oxygen, pH, ORP, temperature, specific conductance, TOC
AOC-090	NA	GW189S	GW176S	GW178S, GW207S, and GW208S	Dissolved oxygen, pH, ORP, temperature, specific conductance, TOC [5]
Apron A	NA	GW264S	NA	NA	Dissolved oxygen, pH, ORP, temperature, specific conductance, TOC

Notes:

1. In addition to COCs listed in Table A-1, primary geochemical indicators will be monitored during each regular monitoring event.
2. All primary geochemical indicators except TOC are monitored in the field during sampling. TOC is analyzed in the laboratory following methods specified in the Quality Assurance Project Plan, which is Appendix E to the Cleanup Action Plan (AMEC, 2012).
   The primary geochemical indicators differ slightly depending on whether the site is a fuel-related site or a solvent-related site.
   At a fuel-related site, TOC is not necessary; at a solvent-related site, TOC is a measure of how much electron donor remains present.
   All MNA parameters are measured semiannually in all wells on a wet season/dry season basis.
3. Monitoring wells were abandoned on 11/25/2019 prior to Apron R construction and will be replaced upon completion of construction.
4. Groundwater monitoring and sampling will be suspended until completion of construction.
5. TOC will only be analyzed in the groundwater from the source area well (GW189S).

Abbreviations:

AOC = area of concern
COCs = constituents of concern
CPOC = conditional point of compliance
MNA = Monitored Natural Attenuation
NA = not applicable
ORP = oxidation reduction potential
SWMU = solid waste management unit
TOC = total organic carbon

Appendix B

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1305

Sample Number: RGW230I- 200810 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 7.62 Time: 1234 Flow through cell vol. GW Meter No.(s SLOPE 0

Begin Purge: Date/Time: 8/ 10 /2020 @ 1239 End Purge: Date/Time: 8/ /2020 @ 1301 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1242	20.3	416.3	0.24	6.18	80.6		7.62		
1245	23.4	431.0	0.33	6.16	77.8		7.62		
1248	23.9	439.4	0.25	6.18	73.9		7.62		
1251	24.8	442.3	0.25	6.21	70.1				
1254	25.6	441.9	0.29	6.23	66.0				
1257	26.3	441.0	0.31	6.25	60.4				
1300	26.8	440.6	0.36	6.27	54.7				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, SOME LIGHT FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	27.0	440.3	0.38	6.28	53.7				
2	26.9	441.0	0.38	6.28	53.2				
3	26.9	441.3	0.37	6.28	52.7				
4	27.1	441.2	0.40	6.28	52.1				
Average:	27.0	441.0	0.38	6.28	52.9	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
3	(8260C SIM VC) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
	(COD) (TOC SM5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1141

Sample Number: RGW152S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 9.57 Time: 1109 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 1112 End Purge: Date/Time: 8/10/2020 @ 1130 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1115	19.5	259.2	1.84	6.13	7.3		9.58		
1118	20.4	294.9	1.25	6.14	-7.8		9.59		
1121	20.8	297.4	1.21	6.14	-11.7		9.59		
1124	21.1	297.9	1.14	6.15	-13.4				
1127	21.5	297.3	1.10	6.15	-13.8				
1130	21.8	296.2	1.04	6.15	-13.8				
1132									

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): GREY, LOW-MED TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.9	296.2	1.01	6.15	-13.8				
2	21.9	296.3	1.00	6.15	-13.8				
3	21.9	296.0	1.01	6.14	-13.8				
4	22.0	296.0	1.02	6.14	-13.9				
Average:	21.9	296.1	1.01	6.15	-13.8	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s): Duplicate Location (DUP1)

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 800

Sample Number: RGWDUP1 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) Time: Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ End Purge: Date/Time: 8/10/2020 @ Gallons Purged:

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
			DUPLICATE TO RGW152S						

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): GREY, LOW-MED TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1									
2									
3									
4									
Average:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s): Duplicate to RGW152S

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1416

Sample Number: RGW153S- 200810 | Weather: SUNNY, SHADED

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 9.95 Time: 1344 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 1346 End Purge: Date/Time: 8/10/2020 @ 1407 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1349	20.1	190.0	4.01	6.49	24.8		9.97		
1352	20.7	197.7	3.37	6.39	22.7		9.98		
1355	21.5	218.8	2.60	6.39	14.6		9.98		
1358	22.1	239.1	2.29	6.43	2.6		9.98		
1401	22.4	259.5	1.60	6.45	-4.0				
1404	22.6	261.2	1.47	6.45	-6.1				
1406	22.7	263.7	1.27	6.45	-7.6				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	22.7	264.7	1.22	6.44	-8.0				
2	22.7	264.7	1.24	6.45	-8.4				
3	22.7	264.7	1.25	6.45	-8.7				
4	22.8	264.8	1.22	6.45	-8.9				
Average:	22.7	264.7	1.23	6.45	-8.5	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1101

Sample Number: RGW172S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 9.55 Time: 1030 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 1033 End Purge: Date/Time: 8/10/2020 @ 1054 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1036	21.4	294.7	1.16	6.36	-0.6		9.67		
1039	22.4	309.4	0.86	6.36	-2.7		9.63		
1042	23.0	328.5	0.72	6.41	-8.2		9.63		
1045	23.4	337.8	0.65	6.44	-12.6		9.62		
1048	24.0	344.1	0.57	6.46	-17.4				
1051	24.4	348.7	0.55	6.47	-20.2				
1053	24.6	352.5	0.49	6.48	-22.8				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): SLIGHT TAN, LOW-MED TURB, NO/NS, PARTICULATES.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	24.7	352.9	0.49	6.49	-23.3				
2	24.8	353.2	0.48	6.49	-23.4				
3	24.7	353.6	0.48	6.49	-23.4				
4	24.8	354.2	0.47	6.49	-23.3				
Average:	24.8	353.5	0.48	6.49	-23.4	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1306

Sample Number: RGW173S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 9.62 Time: 1223 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 1227 End Purge: Date/Time: 8/10/2020 @ 1248 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1230	20.6	338.9	0.97	6.25	15.0		9.58		
1233	22.6	391.7	0.92	6.35	4.2		9.58		
1236	23.2	402.5	0.94	6.37	0.5		9.58		
1239	24.2	420.9	0.85	6.41	-5.2				
1242	24.6	428.0	0.77	6.41	-7.0				
1245	24.9	433.7	0.70	6.43	-9.0				
1247	25.2	439.6	0.70	6.43	-10.5				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	25.2	440.5	0.67	6.43	-10.8				
2	25.3	441.1	0.68	6.44	-11.0				
3	25.3	441.7	0.68	6.44	-11.2				
4	25.3	442.3	0.66	6.44	-11.5				
Average:	25.3	441.4	0.67	6.44	-11.1	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s): MSMSD Location

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1341

Sample Number: RGW226S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 9.33 Time: 1305 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 1311 End Purge: Date/Time: 8/10/2020 @ 1332 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1314	23.0	257.0	1.18	6.38	10.3		9.33		
1317	24.0	284.9	0.99	6.34	1.1		9.33		
1320	25.0	321.1	0.82	6.37	-10.4		9.33		
1323	25.7	341.1	0.63	6.42	-17.2				
1326	26.1	352.3	0.60	6.44	-22.3				
1329	26.7	361.5	0.49	6.45	-28.2				
1331	26.9	364.5	0.47	6.46	-29.8				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): ORANGISH, LOW-MED TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	26.9	364.7	0.45	6.46	-30.0				
2	26.9	365.4	0.45	6.46	-30.5				
3	27.0	365.6	0.44	6.46	-30.5				
4	27.0	365.8	0.43	6.46	-30.5				
Average:	27.0	365.4	0.44	6.46	-30.4	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 846

Sample Number: RGW232S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 7.58 Time: 817 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 819 End Purge: Date/Time: 8/10/2020 @ 838 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
822	19.3	537	2.01	6.13	-43.1		7.92		
825	19.7	560	1.86	6.09	-36.4		7.96		
828	20.4	577	1.79	6.14	-34.0		8.01		
831	20.8	585	1.91	6.17	-31.6		8.03		
834	21.2	590	1.94	6.21	-29.5		8.10		
837	21.5	596	1.87	6.24	-27.9				
839									

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.6	596	1.84	6.24	-28.2				
2	21.5	597	1.85	6.25	-27.7				
3	21.6	597	1.84	6.25	-27.4				
4	21.6	598	1.82	6.25	-27.4				
Average:	21.6	597	1.84	6.25	-27.7	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1026

Sample Number: RGW234S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 8.20 Time: 939 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 959 End Purge: Date/Time: 8/10/2020 @ 1019 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits	**+/- 3%**	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**>/= 1 flow through cell**	
1002	19.6	236.8	2.26	5.95	13.3		8.22		
1005	20.9	255.1	1.71	5.96	10.6		8.20		
1008	21.8	312.2	1.61	6.11	3.0		8.20		
1011	22.1	338.4	1.38	6.21	0.9				
1014	22.6	340.4	1.30	6.25	-0.2				
1017	22.9	336.2	1.19	6.27	-1.1				
1019	23.0	331.4	1.13	6.28	-1.9				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): TANISH, LOW-MED TURB, NO/NS, SLIGHT PARTICULATES.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	23.1	331.7	1.15	6.28	-2.1				
2	23.1	331.1	1.13	6.29	-2.4				
3	23.1	330.0	1.11	6.29	-2.3				
4	23.2	329.5	1.15	6.29	-2.4				
Average:	23.1	330.6	1.14	6.29	-2.3	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1001

Sample Number: RGW235I- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 7.67 Time: 925 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 929 End Purge: Date/Time: 8/10/2020 @ 949 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
932	20.1	163.6	0.37	6.37	12.9		7.69		
935	20.4	165.9	0.48	6.35	12.2		7.69		
938	20.7	167.0	0.81	6.33	11.7		7.69		
941	21.2	169.4	0.93	6.27	10.6				
944	21.3	169.6	0.83	6.23	11.6				
947	21.5	169.5	0.82	6.17	10.8				
949	21.6	170.8	0.96	6.16	10.2				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.6	170.9	0.99	6.16	10.2				
2	21.6	170.9	1.00	6.16	10.1				
3	21.6	171.1	1.09	6.16	10.1				
4	21.7	171.2	1.05	6.16	10.0				
Average:	21.6	171.0	1.03	6.16	10.1	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 936

Sample Number: RGW236S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 7.48 Time: 901 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 904 End Purge: Date/Time: 8/10/2020 @ 914 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
907	20.2	312.3	3.20	6.39	13.8		7.51		
910	20.4	318.8	3.18	6.37	13.6		7.49		
913	21.1	329.0	3.02	6.34	13.5		7.48		
916									
919									
922									
924									

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): ORANGISH, LOW-MED TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.1	328.5	2.92	6.33	13.6				
2	21.2	334.4	2.87	6.33	13.5				
3	21.3	335.9	2.79	6.33	13.5				
4	21.3	335.0	2.75	6.33	13.6				
Average:	21.2	333.5	2.83	6.33	13.6	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 1346

Sample Number: RGW031S- 200811 | Weather: SUNNY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 4.76 Time: 1301 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 1319 End Purge: Date/Time: 8/11/2020 @ 1341 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits	**+/- 3%**	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**>/= 1 flow through cell**	
1322	19.4	432.3	0.43	6.17	-1.7		4.76		
1325	20.4	444.8	0.43	6.17	-5.6		4.76		
1328	21.1	458.7	0.46	6.20	-10.6		4.76		
1331	21.6	467.5	0.44	6.21	-14.0				
1334	21.9	474.9	0.51	6.22	-15.4				
1337	22.3	483.0	0.51	6.23	-17.6				
1339	22.5	487.0	0.55	6.24	-19.0				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): SLIGHT TAN, LOW TURB, NO/NS, PARTICULATES.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	22.6	487.3	0.54	6.24	-19.2				
2	22.6	487.8	0.55	6.24	-19.3				
3	22.5	488.6	0.55	6.24	-19.5				
4	22.6	489.0	0.55	6.24	-19.6				
Average:	22.6	488.2	0.55	6.24	-19.4	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s): Duplicate Location (DUP2)

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 800

Sample Number: RGWDUP2 200811 | Weather: SUNNY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) Time: Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ End Purge: Date/Time: 8/11/2020 @ Gallons Purged:

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		

DUPLICATE TO RGW031S

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ☒ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ☒ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☒ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): SLIGHT TAN, LOW TURB, NO/NS, PARTICULATES.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	22.6	489.4	0.55	6.24	-19.7				
2	22.6	489.7	0.55	6.24	-19.8				
3	22.6	490.3	0.57	6.24	-19.9				
4	22.7	490.6	0.56	6.24	-20.1				
Average:	22.6	490.0	0.56	6.24	-19.9	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s): Duplicate to RGW031S

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 1146

Sample Number: RGW033S- 200811 | Weather: SUNNY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 4.88 Time: 1119 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 1121 End Purge: Date/Time: 8/11/2020 @ 1141 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits	**+/- 3%**	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**>/= 1 flow through cell**	
1124	19.5	383.4	0.41	6.08	-10.7		4.88		
1127	20.6	393.3	0.40	6.12	-18.0		4.88		
1130	21.5	401.7	0.42	6.15	-23.9		4.88		
1133	22.1	407.9	0.45	6.17	-27.7				
1136	22.5	411.4	0.50	6.18	-30.3				
1139	22.9	414.7	0.55	6.18	-31.9				
1141	23.0	416.9	0.55	6.19	-32.7				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	23.2	417.2	0.58	6.19	-32.8				
2	23.2	417.4	0.58	6.19	-32.8				
3	23.2	417.5	0.59	6.19	-32.8				
4	23.1	417.8	0.59	6.19	-33.1				
Average:	23.2	417.5	0.59	6.19	-32.9	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 1116

Sample Number: RGW034S- 200811 | Weather: SUNNY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 4.98 Time: 1045 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 1048 End Purge: Date/Time: 8/11/2020 @ 1108 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1051	20.5	313.9	0.35	6.37	-31.3		4.98		
1054	21.0	313.0	0.37	6.35	-36.1		4.98		
1057	21.4	314.0	0.43	6.35	-39.4		4.98		
1100	21.8	315.1	0.43	6.36	-41.2				
1103	22.1	316.6	0.49	6.36	-42.9				
1106	22.3	316.8	0.46	6.35	-43.0				
1108	22.5	317.0	0.47	6.35	-43.1				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	22.5	317.0	0.47	6.35	-43.2				
2	22.5	317.0	0.46	6.35	-43.3				
3	22.5	317.1	0.49	6.35	-43.4				
4	22.6	317.0	0.47	6.35	-43.4				
Average:	22.5	317.0	0.47	6.35	-43.3	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 936

Sample Number: RGW143S- 200811 | Weather: CLOUDY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 5.21 Time: 906 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 909 End Purge: Date/Time: 8/11/2020 @ 930 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
912	19.2	307.1	1.39	6.08	-20.3		5.23		
915	19.0	305.1	1.38	6.07	-20.7		5.23		
918	19.0	309.4	1.51	6.06	-21.3		5.23		
921	19.0	313.8	1.50	6.07	-21.5				
924	19.1	319.7	1.40	6.08	-22.9				
927	19.2	321.7	1.53	6.09	-23.8				
929	19.4	323.4	1.52	6.10	-23.6				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	19.4	323.6	1.46	6.11	-23.6				
2	19.5	323.6	1.46	6.11	-23.6				
3	19.4	323.6	1.50	6.11	-23.5				
4	19.4	323.8	1.51	6.11	-23.6				
Average:	19.4	323.7	1.48	6.11	-23.6	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 1031

Sample Number: RGW237S- 200811 | Weather: SUNNY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 4.27 Time: 1000 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 1003 End Purge: Date/Time: 8/11/2020 @ 1024 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1006	19.8	302.7	1.88	6.17	-3.5		4.27		
1009	19.5	368.9	1.57	6.18	-7.9		4.27		
1012	19.5	388.3	1.38	6.25	-15.8		4.27		
1015	19.6	395.8	1.14	6.28	-19.5				
1018	19.7	396.1	1.00	6.29	-20.0				
1021	19.8	394.7	0.98	6.30	-21.0				
1023	19.9	394.4	0.92	6.30	-22.4				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): LIGHT TAN, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	19.9	394.4	0.89	6.30	-22.7				
2	19.9	394.4	0.88	6.30	-22.9				
3	19.9	394.3	0.86	6.30	-23.0				
4	20.0	394.3	0.88	6.30	-23.3				
Average:	19.9	394.4	0.88	6.30	-23.0	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 901

Sample Number: RGW240D-200811 | Weather: CLOUDY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 5.50 Time: 828 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 833 End Purge: Date/Time: 8/11/2020 @ 853 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
836	18.8	364.5	0.69	6.37	-41.5		5.51		
839	18.4	359.9	0.71	6.25	-41.2		5.43		
842	18.2	358.0	0.89	6.14	-36.1		5.38		
845	18.1	360.0	0.94	6.04	-29.6		5.34		
848	18.1	361.7	1.02	5.98	-25.4		5.32		
851	18.2	362.7	1.08	5.97	-24.6		5.30		
853	18.2	361.9	1.16	5.97	-24.7				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): GREYISH, LOW-MED TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	18.2	361.9	1.15	5.98	-24.8				
2	18.2	361.3	1.14	5.98	-24.9				
3	18.3	361.4	1.14	5.98	-25.0				
4	18.3	361.3	1.15	5.99	-25.2				
Average:	18.3	361.5	1.15	5.98	-25.0	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/11/2020@ 1316

Sample Number: RGW-244S 200811 | Weather: SUNNY

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 4.88 Time: 1248 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/11/2020 @ 1250 End Purge: Date/Time: 8/11/2020 @ 1306 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1253	20.9	374.0	0.32	6.09	1.4		4.89		
1256	21.8	390.5	0.40	6.11	-4.4		4.89		
1259	22.6	401.3	0.42	6.15	-8.5		4.89		
1302	23.0	407.9	0.39	6.15	-10.7				
1305	23.6	419.3	0.42	6.16	-13.9				
1308									
1310									

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	23.8	420.6	0.44	6.16	-14.2				
2	23.7	421.3	0.43	6.16	-14.3				
3	23.7	421.9	0.41	6.16	-14.6				
4	23.9	423.8	0.41	6.16	-14.9				
Average:	23.8	421.9	0.42	6.16	-14.5	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/11/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1015

Sample Number: RGW211S- 200810 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: Flush Mount

DTW Before Purging (ft) 8.50 Time: 948 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 @ 950 End Purge: Date/Time: 8/ 10 /2020 @ 1012 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**through cell**	
953	19.4	268.6	0.96	6.04	95.4		8.50		MUD ON END
956	19.6	291.4	1.13	6.02	92.5		8.50		OF WATER LEVEI
959	19.9	280.8	0.81	6.05	85.9		8.50		METER
1002	20.1	266	0.74	6.07	80.5				
1005	20.1	260.5	1.02	6.07	77.6				
1008	20.2	259	0.72	6.07	76.0				
1011	20.2	257.1	0.74	6.08	75.2				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLOUDY, BROWN TINT, NO ODOR, NO SHEEN

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	20.2	256.7	0.97	6.08	75.0				
2	20.2	256.2	0.91	6.08	74.7				
3	20.2	255.9	0.87	6.08	74.6				
4	20.2	255.5	0.84	6.08	74.4				
Average:	20.2	256.1	0.90	6.08	74.7	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
2	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s):

Comments: Lots of mud on the water level meter end. Had to keep pulling it out to clean it to get DTW

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1200

Sample Number: RGW221S- 200810 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: Flush Mount

DTW Before Purging (ft) 10.52 Time: 1132 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 1133 End Purge: Date/Time: 8/ 10 /2020 @ 1155 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1136	22.6	215.0	0.82	5.90	100.2		10.52		
1139	23.3	221.6	0.80	5.92	95.7		10.53		
1142	24.5	255.9	0.69	6.03	86.9		10.53		
1145	24.8	263.7	0.65	6.05	84.2				
1148	25.3	279.0	0.62	6.08	80.8				
1151	25.7	278.3	0.73	6.09	79.5				
1154	25.9	275.3	0.69	6.10	77.8				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLOUDY, SLIGHT BROWN TINT, NO ODOR, NO SHEEN

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	26.0	275.9	0.65	6.10	77.8				
2	26.0	275.9	0.71	6.10	77.6				
3	26.0	275.5	0.69	6.10	77.3				
4	26.0	275.6	0.65	6.10	77.0				
Average:	26.0	275.7	0.68	6.10	77.4	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1105

Sample Number: RGW224S- 200810 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: Flush Mount

DTW Before Purging (ft) 11.03 Time: 1040 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 @ 1042 End Purge: Date/Time: 8/ 10 /2020 @ 1104 Gallons Purged: <1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1045	22.0	174.3	0.69	5.65	113.0		11.11		
1048	22.6	182.0	0.53	5.72	108.6		11.12		
1051	23.1	187.8	0.46	5.80	101.3		11.10		
1054	23.3	189.8	0.40	5.84	97.0				
1057	23.4	190.2	0.42	5.86	93.8				
1100	23.5	190.2	0.43	5.88	91.3				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	23.5	190.0	0.44	5.88	91.0				
2	23.6	189.9	0.45	5.88	90.5				
3	23.6	190.0	0.45	5.89	89.9				
4	23.6	189.8	0.46	5.89	89.6				
Average:	23.6	189.9	0.45	5.89	90.3	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s): Duplicate Location (DUP3)

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1300

Sample Number: DUP3- 200810 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: Flush Mount

DTW Before Purging (ft) 11.03 Time: 1040 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 1104 End Purge: Date/Time: 8/ 10 /2020 @ 1104 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		

DUPLICATE TO RGW224S

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	23.6	190	0.43	5.88	90.7				
2	23.6	190.1	0.46	5.88	90.2				
3	23.6	190.1	0.45	5.88	90.0				
4	23.6	189.8	0.45	5.89	89.3				
Average:	23.6	190.0	0.45	5.88	90.1	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
5	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s): Duplicate to RGW224S 1105

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1530

Sample Number: RGW188S- 200810 | Weather: SUNNY, WINDY, 80S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 3.86 Time: 1503 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 1506 End Purge: Date/Time: 8/ 10 /2020 @ 1528 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1509	22.4	558	0.26	6.24	39.2		3.86		
1512	23.4	567	0.23	6.22	38.1		3.86		
1515	24.2	577	0.27	6.21	37.0		3.86		
1518	24.9	586	0.36	6.22	34.1				
1521	25.4	591	0.44	6.23	30.9				
1524	25.5	591	0.54	6.23	29.4				
1527	25.5	593	0.50	6.23	27.1				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, DARK FINES, EFFERVESCENT

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	25.5	593	0.51	6.22	26.7				
2	25.5	593	0.52	6.22	26.5				
3	25.5	593	0.53	6.22	26.1				
4	25.5	593	0.53	6.23	25.6				
Average:	25.5	593	0.52	6.22	26.2	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1410

Sample Number: RGW247S- 200810 | Weather: SUNNY, 80S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 3.92 Time: 1342 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 1346 End Purge: Date/Time: 8/ 10 /2020 @ 1408 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1349	23.4	543	0.27	6.28	62.5		4.04		
1352	26.2	567	0.28	6.31	56.5		3.98		
1355	26.9	574	0.34	6.32	52.4		3.98		
1358	27.5	578	0.35	6.33	49.9				
1401	28.1	581	0.38	6.34	46.6				
1404	28.7	584	0.43	6.34	40.2				
1407	29.2	586	0.46	6.36	33.9				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, EFFERVESCENT, SOM E ORANGE SOLIDS

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	29.3	586	0.5	6.35	33.3				
2	29.4	587	0.49	6.36	32.6				
3	29.4	587	0.48	6.36	32.0				
4	29.3	587	0.47	6.36	31.3				
Average:	29.4	587	0.49	6.36	32.3	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 1450

Sample Number: RGW248I- 200810 | Weather: SUNNY, WINDY, 80S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 3.61 Time: 1420 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 @ 1425 End Purge: Date/Time: 8/ 10 /2020 @ 1447 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits	**+/- 3%**	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**>/= 1 flow through cell**	
1428	24.3	632	0.21	6.32	40.6		3.65		
1431	26.1	657	0.25	6.32	36.3		3.63		
1434	26.8	667	0.28	6.31	33.6		3.62		
1437	27.6	674	0.36	6.31	29.2				
1440	28.1	678	0.44	6.32	24.0				
1443	28.8	684	0.52	6.32	14.4				
1446	29.0	685	0.51	6.31	10.6				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, EFFERVESCENT

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	29.1	685	0.52	6.31	10.1				
2	29.1	686	0.52	6.31	9.5				
3	29.1	686	0.51	6.31	9.1				
4	29.1	686	0.51	6.31	8.6				
Average:	29.1	686	0.52	6.31	9.3	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1521

Sample Number: RGW249S- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 3.60 Time: 1450 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 1453 End Purge: Date/Time: 8/10/2020 @ 1514 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
1456	20.9	411.0	0.25	6.21	-11.8		3.60		
1459	23.5	435.9	0.30	6.29	-30.0		3.60		
1502	24.3	472.1	0.27	6.30	-37.1		3.60		
1505	25.5	483.9	0.30	6.31	-42.6				
1508	26.1	492.5	0.36	6.32	-46.0				
1511	26.5	495.4	0.40	6.32	-47.4				
1513	26.9	497.9	0.47	6.32	-48.4				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): TANISH, LOW TURB, NNO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	26.8	498.1	0.46	6.32	-48.4				
2	26.9	498.2	0.48	6.32	-48.5				
3	26.9	498.5	0.49	6.32	-48.6				
4	26.9	498.8	0.48	6.32	-46.8				
Average:	26.9	498.4	0.48	6.32	-48.1	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 12 /2020@ 1340

Sample Number: RGW250S- 200812 | Weather: PARTLY CLOUDY, 60S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 3.63 Time: 1312 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 12 /2020 1314 End Purge: Date/Time: 8/ 12 /2020 @ 1336 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1317	17.6	128.7	1.31	6.78	58.5		3.85		
1320	18.1	129.8	1.06	6.70	62.0		3.82		
1323	18.9	129.6	0.83	6.67	60.7		3.79		
1326	19.1	129.5	0.79	6.66	59.3				
1329	19.3	129.3	0.76	6.66	57.7				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, YELLOW TINT, NO ODOR, NO SHEEN

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	19.4	129.3	0.74	6.66	57.4				
2	19.4	129.3	0.73	6.66	57.3				
3	19.4	129.2	0.76	6.66	57.0				
4	19.4	129.2	0.74	6.66	56.9				
Average:	19.4	129.3	0.74	6.66	57.2				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	(8260) (8010) (8021) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.12.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 1115

Sample Number: RGW009S- 200811 | Weather: INDOORS

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.73 Time: 1045 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 1048 End Purge: Date/Time: 8/ 11 /2020 @ 1110 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1051	20.8	385.1	0.33	6.23	87.2		4.73		
1054	20.9	385.1	0.38	6.21	84.3		4.73		
1057	21.0	385.0	0.37	6.20	82.2		4.73		
1100	21.0	385.3	0.40	6.20	79.8				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, SOME LIGHT FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.0	385.6	0.39	6.20	79.4				
2	21.0	385.3	0.40	6.20	79.2				
3	21.0	385.3	0.40	6.20	79.1				
4	21.0	385.3	0.39	6.20	78.9				
Average:	21.0	385.4	0.40	6.20	79.2				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ NA

Sample Number: RGW010S- 200811 | Weather: INDOORS

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.87 Time: 1023 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 @ NA End Purge: Date/Time: 8/ 11 /2020 @ NA Gallons Purged: NA

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Other

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		

WATER LEVEL ONLY

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ☐ Pump/Pump Type

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ☐ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NA

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1									
2									
3									
4									
Average:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ NA

Sample Number: RGW011D- 200811 | Weather: INDOORS

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.88 Time: 1026 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 @ NA End Purge: Date/Time: 8/ 11 /2020 @ NA Gallons Purged: NA

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ☐ Other

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
	WATER LEVEL ONLY								

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ☐ Pump/Pump Type

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ☐ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NA

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1									
2									
3									
4									
Average:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s):

Comments: WATER LEVEL STARTED AT 4.79 BUT CAME UP TO 4.88 AFTER WAITING ~5 MINUTES

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 1015

Sample Number: RGW012S- 200811 | Weather: SUNNY, 60S, INDOOR

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.52 Time: 946 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 948 End Purge: Date/Time: 8/ 11 /2020 @ 1010 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
951	21.8	583	0.36	5.94	108.5		4.52		
954	21.9	563	0.48	5.92	103.6		4.51		
957	22.0	549	0.63	5.92	101.9		4.51		
1000	22.1	535	1.01	5.93	99.2				
1003	22.2	529	1.13	5.93	96.7				
1006	22.2	526	1.21	5.93	94.2				
1009	22.3	525	1.24	5.93	92.6				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, LIGHT FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	22.3	525	1.23	5.93	92.3				
2	22.3	525	1.22	5.93	92.0				
3	22.4	524	1.25	5.93	91.8				
4	22.3	524	1.24	5.93	91.6				
Average:	22.3	525	1.24	5.93	91.9				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 915

Sample Number: RGW014S- 200811 | Weather: OVERCAST, 60S, INDOOR

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.56 Time: 844 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 849 End Purge: Date/Time: 8/ 11 /2020 @ 912 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
852	20.7	455.8	0.74	7.07	56.3		4.64		
855	20.9	456.0	0.71	6.66	66.7		4.64		
858	21.0	454.0	0.76	6.26	89.8		4.63		
901	21.1	450.9	0.93	6.18	93.8		4.63		
904	21.2	448.4	1.06	6.15	94.3				
907	21.2	446.9	1.10	6.14	92.2				
910	21.3	446.3	1.14	6.14	91.5				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, ORANGE SOLIDS

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.2	446.4	1.12	6.14	91.2				
2	21.3	445.8	1.14	6.14	90.7				
3	21.3	445.6	1.14	6.15	90.2				
4	21.3	445.5	1.13	6.15	89.7				
Average:	21.3	445.8	1.13	6.15	90.5				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s): Duplicate location (DUP4)

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 800

Sample Number: RGWDUP4 200811 | Weather: OVERCAST, 60S, INDOOR

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.54 Time: 844 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 849 End Purge: Date/Time: 8/ 11 /2020 @ 912 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		

DUPLICATE TO RGW014S

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, ORANGE SOLIDS

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.3	446.0	1.14	6.14	90.9				
2	21.3	445.8	1.12	6.14	90.4				
3	21.3	445.6	1.13	6.15	90.0				
4	21.3	445.4	1.16	6.15	89.4				
Average:	21.3	445.7	1.14	6.15	90.2				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s): Duplicate to RGW014S

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 1155

Sample Number: RGW147S- 200811 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.17 Time: 1125 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 1129 End Purge: Date/Time: 8/ 11 /2020 @ 1151 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1132	21.1	61.5	0.69	5.78	122.8		4.17		
1135	21.5	63.0	0.67	5.66	127.4		4.17		
1138	21.5	64.0	0.60	5.59	127.4		4.17		
1141	21.5	64.4	0.58	5.58	129.3				
1144	21.9	65.6	0.54	5.57	127.0				
1147	22.0	67.0	0.51	5.56	125.4				
1150	22.2	67.5	0.48	5.57	124.9				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, BROWN SOLIDS

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	22.2	67.6	0.49	5.57	124.6				
2	22.2	67.7	0.47	5.57	124.3				
3	22.2	67.8	0.46	5.57	124.7				
4	22.1	68.0	0.48	5.57	124.7				
Average:	22.2	67.8	0.48	5.57	124.6	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 1245

Sample Number: RGW150S- 200811 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.58 Time: 1218 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 1222 End Purge: Date/Time: 8/ 11 /2020 @ 1244 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1225	20.1	381.6	0.29	6.23	87.7		4.58		
1228	20.4	380.7	0.31	6.24	85.3		4.58		
1231	20.9	381.0	0.34	6.25	82.1		4.58		
1234	21.7	383.0	0.33	6.27	78.7				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.9	383.9	0.35	6.27	78.3				
2	22.0	384.3	0.34	6.27	77.9				
3	21.9	384.4	0.34	6.27	77.5				
4	22.2	384.5	0.34	6.28	77.1				
Average:	22.0	384.3	0.34	6.27	77.7				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 11 /2020@ 1320

Sample Number: RGW253I- 200811 | Weather: SUNNY, 70S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 4.48 Time: 1252 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 11 /2020 1255 End Purge: Date/Time: 8/ 11 /2020 @ 317 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1258	19.1	366.9	0.25	6.40	79.2		4.48		
1301	19.9	370.1	0.25	6.37	77.6		4.48		
1304	21.1	385.9	0.22	6.36	71.7		4.48		
1307	21.5	391.1	0.22	6.38	68.7				
1310	21.6	393.2	0.23	6.39	66.4				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): SLIGHTLY CLOUDY, COLORLESS, SOME DARK FINES, NO SHEEN, NO ODOR

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.6	393.9	0.22	6.39	65.4				
2	21.7	394.6	0.24	6.39	65.1				
3	21.7	394.8	0.23	6.40	64.9				
4	21.7	395.2	0.23	6.40	64.2				
Average:	21.7	394.6	0.23	6.40	64.9				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.11.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: August 2020 | Date/Time: 8/10/2020@ 1001

Sample Number: RGW235I- 200810 | Weather: SUNNY

Landau Representative: JAN

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe:

DTW Before Purging (ft) 7.67 Time: 925 Flow through cell vol. GW Meter No.(s 1

Begin Purge: Date/Time: 8/10/2020 @ 929 End Purge: Date/Time: 8/10/2020 @ 949 Gallons Purged: 0.25

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
932	20.1	163.6	0.37	6.37	12.9		7.69		
935	20.4	165.9	0.48	6.35	12.2		7.69		
938	20.7	167.0	0.81	6.33	11.7		7.69		
941	21.2	169.4	0.93	6.27	10.6				
944	21.3	169.6	0.83	6.23	11.6				
947	21.5	169.5	0.82	6.17	10.8				
949	21.6	170.8	0.96	6.16	10.2				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type DED. BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): NO COLOR, LOW TURB, NO/NS.

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	21.6	170.9	0.99	6.16	10.2				
2	21.6	170.9	1.00	6.16	10.1				
3	21.6	171.1	1.09	6.16	10.1				
4	21.7	171.2	1.05	6.16	10.0				
Average:	21.6	171.0	1.03	6.16	10.1	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
3	(8260-SIM) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX) WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease) WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)
1	(COD) (TOC5310C) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)
1	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic
	VOC (Boeing short list)
	Methane Ethane Ethene Acetylene
	others

Duplicate Sample No(s):

Comments:

Signature: JAN Date: 8/10/2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 12 /2020@ 1225

Sample Number: RGW176S- 200812 | Weather: OVERCAST, 60S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 5.77 Time: 1156 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 12 /2020 1159 End Purge: Date/Time: 8/ 12 /2020 @ 1221 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits	**+/- 3%**	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**>/= 1 flow through cell**	
1202	15.3	552	0.40	6.15	101.9		5.67		
1205	16.2	560	0.45	6.14	96.7		5.59		
1208	16.6	572	0.52	6.14	93.9		5.55		
1211	17.0	581	0.61	6.15	90.0				
1214	17.2	584	0.71	6.15	88.2				
1217	17.5	588	0.77	6.16	85.3				
1220	17.7	592	0.81	6.17	82.1				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, YELLOW TINT, NO ODOR, NO SHEEN, DARK AND LIGHT SOLIDS
SLIGHTLY EFFERVESCENT

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	17.7	592	0.84	6.18	81.8				
2	17.7	593	0.84	6.18	81.6				
3	17.7	593	0.84	6.18	81.4				
4	17.7	593	0.84	6.18	81.2				
Average:	17.7	593	0.84	6.18	81.5				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.12.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 12 /2020@ 935

Sample Number: RGW178S- 2008 | Weather: OVERCAST, 60S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 8.07 Time: 905 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 12 /2020 @ 909 End Purge: Date/Time: 8/ 12 /2020 @ 931 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
912	15.5	361.2	0.57	6.00	98.7		8.07		
915	16.0	402.3	0.49	5.99	92.5		8.08		
918	16.1	415.7	0.53	6.01	89.5		8.08		
921	16.2	423.6	0.57	6.03	86.7				
924	16.2	425.8	0.62	6.05	84.7				
927	16.2	425.2	0.65	6.06	83.6				
930	16.1	422.3	0.71	6.07	82.4				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, DARK FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	16.1	422.1	0.71	6.07	82.3				
2	16.1	421.7	0.71	6.07	82.2				
3	16.1	421.1	0.72	6.07	82.1				
4	16.1	420.9	0.71	6.07	82.0				
Average:	16.1	421.5	0.71	6.07	82.2				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.12.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 12 /2020@ 1025

Sample Number: RGW189S- 200812 | Weather: OVERCAST, 60S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 6.83 Time: 956 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 12 /2020 1000 End Purge: Date/Time: 8/ 12 /2020 @ 1022 Gallons Purged: <

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
1003	15.9	229.3	1.55	5.84	122.8		7.02		
1006	16.1	248.0	1.49	5.83	116.5		6.96		
1009	16.2	256.3	1.35	5.85	113.5		6.95		
1012	16.3	261.9	1.42	5.88	110.4				
1015	16.7	266.2	1.40	5.93	105.6				
1018	16.8	272.8	1.31	5.97	101.9				
1021	16.8	274.9	1.48	5.99	100.6				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, DARK FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	16.8	274.9	1.51	5.99	100.4				
2	16.8	275.5	1.46	5.99	100.2				
3	16.8	277.3	1.40	5.99	100.0				
4	16.9	276.2	1.26	5.99	99.8				
Average:	16.8	276.0	1.41	5.99	100.1				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)		
7	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐	OR ☐
2	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐	OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)		
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)		
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)		
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)		
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic		
	VOC (Boeing short list)		
	Methane Ethane Ethene Acetylene		
	others		

Duplicate Sample No(s): MSMSD Location

Comments: REPLACED SOAK SOCK

Signature: BXM Date: 8.12.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 12 /2020@ 1145

Sample Number: RGW207S- 200812 | Weather: OVERCAST, 60S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 6.96 Time: Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 12 /2020 @ 1121 End Purge: Date/Time: 8/ 12 /2020 @ 1143 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits	**+/- 3%**	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**	**>/= 1 flow through cell**	
1124	15.7	368.3	0.42	6.07	113.5		6.45		
1127	15.7	377.2	0.46	6.07	107.7		6.41		
1130	15.9	380.9	0.50	6.08	105.0		6.40		
1133	16.4	379.6	0.52	6.08	101.6				
1136	16.5	380.8	0.66	6.08	100.7				
1139	16.6	388.2	0.54	6.09	99.2				
1142	16.6	395.6	0.56	6.10	97.6				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, YELLOW TINT, NO ODOR, NO SHEEN, DARK FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	16.6	396.2	0.56	6.10	97.4				
2	16.6	369.9	0.56	6.10	97.3				
3	16.6	399.4	0.54	6.10	97.1				
4	16.6	399.9	0.54	6.10	96.9				
Average:	16.6	391.4	0.55	6.10	97.2				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.12.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 12 /2020@ 855

Sample Number: RGW208S- 200812 | Weather: PARTLY CLOUDY, 60S

Landau Representative: BXM

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: FLUSH

DTW Before Purging (ft) 7.89 Time: 828 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 12 /2020 @ 830 End Purge: Date/Time: 8/ 12 /2020 @ 852 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							**>/= 1 flow through cell**	
	+/- 3%	**+/- 3%**	**+/- 10%**	**+/- 0.1 units**	**+/- 10 mV**	**+/- 10%**	**< 0.3 ft**		
833	16.9	466.7	0.70	6.57	46.4		7.94		
836	17.3	470.3	0.93	6.25	61.4		7.92		
839	17.4	476.1	0.80	6.12	67.9		7.91		
842	17.6	475.8	0.89	6.08	69.5				
845	17.6	471.9	0.88	6.08	69.0				
848	17.7	468.5	0.87	6.09	68.9				

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type BLADDER

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, DARK FINES

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	17.8	467.0	0.95	6.09	69.1				
2	17.8	467.0	0.93	6.09	69.0				
3	17.8	467.1	0.93	6.09	68.9				
4	17.8	466.0	0.94	6.09	68.8				
Average:	17.8	466.8	0.94	6.09	69.0				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
3	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.12.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ NA

Sample Number: RGW263S- 200810 | Weather: sunny, 60s

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: Flush Mount

DTW Before Purging (ft) 6.18 Time: 918 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 NA End Purge: Date/Time: 8/ 10 /2020 @ NA Gallons Purged: NA

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
Purge Goals: Stablization of Parameters for three consecutive readings within the following limits								>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		

WATER LEVEL ONLY

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ☐ Pump/Pump Type

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ☐ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ☐ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.):

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1									
2									
3									
4									
Average:	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!			

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

LANDAU ASSOCIATES

Groundwater Low-Flow Sample Collection Form

Project Name: Boeing Renton | Project Number: 0025217.099.099

Event: Aug-20 | Date/Time: 8/ 10 /2020@ 910

Sample Number: RGW264S- 200810 | Weather: SUNNY, 60S

Landau Representative:

WATER LEVEL/WELL/PURGE DATA

Well Condition: Secure (YES) Damaged (NO) Describe: Flush Mount

DTW Before Purging (ft) 5.67 Time: 843 Flow through cell vol. GW Meter No.(s SLOPE 10

Begin Purge: Date/Time: 8/ 10 /2020 845 End Purge: Date/Time: 8/ 10 /2020 @ 907 Gallons Purged: < 1

Purge water disposed to: ☐ 55-gal Drum ☐ Storage Tank ☐ Ground ■ Other SITE TREATMENT SYSTEM

Time	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Internal Purge Volume (gal)	Comments/ Observations
	Purge Goals: Stablization of Parameters for three consecutive readings within the following limits							>/= 1 flow through cell	
	+/- 3%	+/- 3%	+/- 10%	+/- 0.1 units	+/- 10 mV	+/- 10%	< 0.3 ft		
848	20.2	407.3	0.4	6.31	106.6		6.69		PERI ON
851	20.3	420.6	0.39	5.99	116.7		6.90		LOWEST SPEED
854	20.4	466.3	0.47	5.94	111.5		7.03		
857	20.5	474.2	0.67	5.93	106.8		7.11		
900	20.3	510	0.80	5.93	101.0		7.18		
903	20.1	549	0.84	5.94	97.0		7.22		
906	20.0	575	0.87	5.96	92.7		7.25		

SAMPLE COLLECTION DATA

Sample Collected With: ☐ Bailer ■ Pump/Pump Type PERI

Made of: ☐ Stainless Steel ☐ PVC ☐ Teflon ☐ Polyethylene ☐ Other ■ Dedicated

Decon Procedure: ☐ Alconox Wash ☐ Tap Rinse ☐ DI Water ■ Dedicated

(By Numerical Order) ☐ Other

Sample Description (color, turbidity, odor, sheen, etc.): CLEAR, COLORLESS, NO ODOR, NO SHEEN, EFFERVESCENT

Replicate	Temp (°F/°C)	Cond. (uS/cm)	D.O. (mg/L)	pH	ORP (mV)	Turbidity (NTU)	DTW (ft)	Ferrous iron (Fe II)	Comments/ Observations
1	20.0	585	0.9	5.96	91.2				
2	19.9	588	0.9	5.97	90.6				
3	19.9	592	0.9	5.96	90.0				
4	19.9	596	0.9	5.96	89.5				
Average:	19.9	590	0.9	5.96	90.3				

QUANTITY	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)	
7	(8260) (8010) (8020) (NWTPH-G) (NWTPH-Gx) (BTEX)	WA ☐ OR ☐
2	(8270D) (PAH) (NWTPH-D) (NWTPH-Dx) (TPH-HCID) (8081) (8141) (Oil & Grease)	WA ☐ OR ☐
	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO3/CO3) (Cl) (SO4) (NO3) (NO2) (F)	
	(COD) (TOC) (Total PO4) (Total Kiedahl Nitrogen) (NH3) (NO3/NO2)	
	(Total Cyanide) (WAD Cyanide) (Free Cyanide)	
	(Total Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
	(Dissolved Metals) (As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na) (Hardness) (Silic	
	VOC (Boeing short list)	
	Methane Ethane Ethene Acetylene	
	others	

Duplicate Sample No(s):

Comments:

Signature: BXM Date: 8.10.2020

Appendix C

Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
SWMU-168
ARI Work Order Number: 20H0100

This memo presents the summary data quality review of one primary groundwater sample and one trip blank sample collected on August 10, 2020. The samples were submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were analyzed for volatile organic compounds (vinyl chloride) by U.S. Environmental Protection Agency (EPA) Method 8260D with selected ion monitoring.

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW230I-200810	20H0100-01	vinyl chloride
Trip Blanks	20H0100-02	vinyl chloride

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014).

ARI received the samples on August 10, 2020. The temperature of the cooler was recorded upon receipt and was below the maximum acceptable temperature of 6 degrees Celsius (ºC).

Organic analyses

Samples were analyzed for vinyl chloride. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable

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3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable

   Extra volume was not submitted for analysis of MS/MSD samples. The project frequency requirement was achieved with MS/MSD analysis conducted at other sites included in this sampling event.

6. Field Duplicates – Acceptable

   Field duplicates were not collected at this site during this sampling event. The project frequency requirement of one field duplicate for every 20 samples was achieved with field duplicate samples collected at other sites included in this sampling event.

7. Reporting Limits and Laboratory Flags – Acceptable.

Overall assessment of data

The table below summarizes the data assessment. The completeness of ARI work order number 20H0100 is 100 percent. The usefulness of these data was evaluated based on EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits.

Sample ID	Qualified Analyte
RGW230I-200810	none
Trip Blanks	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
SWMU-172/174
ARI Group Number: 20H0103

This memo presents the summary data quality review of nine primary groundwater samples, one groundwater field duplicate, and one trip blank sample collected on August 10, 2020. The samples were submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were analyzed for the following:

- Volatile organic compounds (VOCs) (cis-1,2-dichloroethene, tetrachloroethene, trichloroethene, and vinyl chloride) by U.S. Environmental Protection Agency (EPA) Method 8260D with selected ion monitoring;
- Total organic carbon (TOC) by Standard Method 5310B; and
- Total metals (arsenic, copper, and lead) by EPA Method 6020A.

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW232S-200810	20H0103-01	all
RGW236S-200810	20H0103-02	all
RGW235I-200810	20H0103-03	all
RGW234S-200810	20H0103-04	all
RGW172S-200810	20H0103-05	all
RGWDUP1-200810	20H0103-06	all
RGW152S-200810	20H0103-07	all
RGW173S-200810	20H0103-08	all
RGW226S-200810	20H0103-09	all
RGW153S-200810	20H0103-10	all
Trip Blanks	20H0103-11	VOCs

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Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014a and b).

ARI received the samples on August 10, 2020. The temperatures of the coolers were recorded upon receipt and were below the maximum acceptable temperature of 6 degrees Celsius.

Organic analyses

Samples were analyzed for VOCs. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable
6. Field Duplicates – Acceptable except as noted

   One field duplicate was submitted for each analysis during this sampling event, meeting the project frequency requirement of five percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate relative percent differences (RPDs) is 30 percent for concentrations greater than five times the reporting limit. The field duplicate RPDs were within the control limits.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (ng/L)	Duplicate Result (ng/L)	Reporting Limit (ng/L)	RPD (%)
RGW152S-200810/ RGWDUP1-200810	vinyl chloride	284	299	20	5
	cis-1,2-dichloroethene	1,660	1,740	20	5
	trichloroethene	579	575	20	1
	tetrachloroethene	319	296	20	7

Abbreviations
ng/L = nanograms per liter
NC = not calculated
RPD = relative percent difference

7. Reporting Limits and Laboratory Flags – Acceptable

Inorganic analyses

Samples were analyzed for total metals and TOC. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. LCS– Acceptable
4. MS/MSD – Acceptable as noted:

   The MS/MSD sample for total metals was diluted for analysis. The results are not qualified for use.
5. Laboratory Duplicates – Acceptable except as noted:

   The laboratory duplicate for total copper was diluted for analysis, and was above the RPD control limit of 20. The results are flagged as listed below.
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during this sampling event, meeting the project frequency requirement of five percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate RPDs is 30 percent for concentrations greater than five times the reporting limit. The field duplicate RPDs were within control limits, except for total copper. Both the laboratory duplicate and field duplicate for total copper results were above RPD control limits; primary and duplicate results for total copper will be flagged with a "J".

Sample ID/ Field Duplicate ID	Analyte	Primary Result	Duplicate Result	Reporting Limit	RPD (%)
RGW152S-200810/ RGWDUP1-200810	TOC	6.76 mg/L	5.59 mg/L	0.50 mg/L	19
	total arsenic	6.72 µg/L	7.07 µg/L	0.400 µg/L	5
	total copper	7.45 µg/L	10.3 µg/L	1.00 µg/L	32
	total lead	3.89 µg/L	4.77 µg/L	0.200 µg/L	20

Abbreviations:
µg/L = micrograms per liter
mg/L = milligrams per liter
RPD = relative percent difference
TOC = total organic carbon

7. Reporting Limits and Laboratory Flags – Acceptable

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order number 20H0103 is 100 percent. The usefulness of these data was evaluated based on EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte	Reason for Qualifier	Qualified Result (µg/L)
RGW232S-200810	none	NA	NA
RGW236S-200810	none	NA	NA
RGW235I-200810	none	NA	NA
RGW234S-200810	none	NA	NA
RGW172S-200810	none	NA	NA
RGWDUP1-200810	Total copper	Lab and field duplicate RPD	10.3 J
RGW152S-200810	Total copper	Lab and field duplicate RPD	7.45 J
RGW173S-200810	none	NA	NA
RGW226S-200810	none	NA	NA
RGW153S-200810	none	NA	NA
Trip Blanks	none	NA	NA

Abbreviations
µg/L = micrograms per liter
J = the value is an estimate
NA = not applicable
RPD = relative percent difference

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014a, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2014b, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
Building 4-78/79 SWMU/AOC Group
ARI Work Order Number: 20H0115

This memo presents the summary data quality review of seven primary groundwater samples, one field duplicate groundwater sample, and one trip blank sample collected on August 11, 2020. The samples were submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology (Ecology). The samples were analyzed for the following:

- Volatile organic compounds (VOCs) (limited suite: benzene, vinyl chloride, cis-1,2-dichloroethene, and trichloroethene) by U.S. Environmental Protection Agency (EPA) Method 8260D;
- Total petroleum hydrocarbons as gasoline (TPH-G) by Ecology Method NWTPH-G; and
- Total organic carbon (TOC) by Standard Method 5310B-00.

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
Trip Blanks	20H0115-01	VOCs and TPH-G
RGW240D-200811	20H0115-02	all
RGW143S-200811	20H0115-03	all
RGW237S-200811	20H0115-04	all
RGW034S-200811	20H0115-05	all
RGW033S-200811	20H0115-06	all
RGW244S-200811	20H0115-07	all
RGW031S-200811	20H0115-08	all
RGWDUP2-200811	20H0115-09	all

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used

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to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in EPA guidelines (EPA, 2014a and b).

ARI received the samples on August 11, 2020. The temperatures of the coolers were recorded upon receipt and were below the maximum acceptable temperature of 6 degrees Celsius.

Organic analyses

Samples were analyzed for VOCs and TPH-G. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable as noted:

   Samples RGW031S-200811 and RGWDUP2-200512 each had one surrogate above control limits in the initial analysis. The sample was rerun and the same surrogate remained above control limits. It is recommended that the initial analysis results for RGW031S-200811 and RGWDUP2-200811 be used and flagged with a "J."
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable except as noted:

   The percent recovery in the MS sample was below control limits for cis-1,2 dichloroethene and TPH-G. Calibration did not meet acceptance criteria for vinyl chloride in the MS and MSD sample. The data is not qualified for use.
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during this sampling event, meeting the project frequency requirement of five percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The relative percent differences (RPDs) for the field duplicate are within the project-specific control limit of 30 percent for concentrations greater than five times the reporting limit. The RPD is not calculated for results that are less than five times the reporting limit, as indicated on the table below by "NC." In these cases, the absolute value of the difference between the primary and duplicate result should not exceed the value of the reporting limit. As shown in the table below, the field duplicate results are acceptable.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (µg/L)	Duplicate Result (µg/L)	Reporting Limit (µg/L)	RPD (%)
RGW031S-200811/ RGWDUP2-200811	vinyl chloride	0.32	0.25	0.20	NC
	cis-1,2-dichloroethene	0.67	0.52	0.20	NC
	benzene	1.72	2.05	0.20	18
	trichloroethene	0.20 U	0.20 U	0.20	NC
	TPH-G	1,160	1,180	100	2

Abbreviations
µg/L = micrograms per liter
NC = not calculated
RPD = relative percent difference
U = analyte was not detected above the reporting limit
TPH-G = total petroleum hydrocarbons as gasoline

7. Reporting Limits and Laboratory Flags – Acceptable as noted:

   The analytes vinyl chloride and cis-1,2 dichloroethene were flagged with an "E" in sample RGW033S-200811, indicating the analyte concentration exceeds the upper limit of calibration. The sample was reanlyzed with analytes within calibration range; the results from reanalysis should be used and are not qualified.The analyte cis-1,2 dichloroethene was flagged with "Y1" in samples RGW031S-200811 and RGWDUP2-200811, indicating an increased reporting limit due to interference. The reporting limit is still below the associated cleanup level and is acceptable.

Inorganic analyses

Samples were analyzed for TOC. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. LCS/LCSD – Acceptable
4. MS/MSD – Acceptable
5. Laboratory Duplicates – Acceptable
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during this sampling event, meeting the project frequency requirement of five percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The RPDs are acceptable.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (mg/L)	Duplicate Result (mg /L)	Reporting Limit (mg /L)	RPD (%)
RGW031S-200811/ RGWDUP2-200811	TOC	12.05	13.30	0.50	10

Abbreviations:
mg/L = milligrams per liter
RPD = relative percent difference
TOC = total organic carbon

7. Reporting Limits and Laboratory Flags – Acceptable as noted:

   The TOC in sample RGWDUP2-200811 was diluted at a factor of 10; the data is not qualified for use.

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order number 20H0115 is 100 percent. Evaluation of the usefulness of these data is based on EPA guidance documents identified in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte	Qualified Result (µg/L)	Qualifier Reason
Trip Blanks	none	none	NA
RGW240D-200811	none	none	NA
RGW143S-200811	none	none	NA
RGW237S-200811	none	none	NA
RGW034S-200811	none	none	NA
RGW033S-200811	none	none	NA
RGW244S-200811	none	none	NA
RGW031S-200811	vinyl chloride cis-1,2-dichloroethene benzene trichloroethene	0.32 J 0.67 J 1.72 J 0.20 UJ	Surrogate recoveries
RGWDUP2-200811	vinyl chloride cis-1,2-dichloroethene benzene trichloroethene	0.25 J 0.52 J 2.05 J 0.20 UJ	Surrogate recoveries

Abbreviations:
µg/L = micrograms per liter
J = the value is an estimate
NA = not applicable
UJ = the analyte was not detected at the estimated reporting limit indicated

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014a, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2014b, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

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Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
Former Fuel Farm AOC Group
ARI Work Order Number: 20H0099

This memo presents the summary data quality review of three primary groundwater samples and one field duplicate collected on August 10, 2020. The samples were submitted to Analytical Resources Inc. (ARI), a Washington State Department of Ecology (Ecology)-accredited laboratory located in Tukwila, Washington. The samples were analyzed for total petroleum hydrocarbons as diesel (TPH-D), plus motor oil (TPH-O) and Jet A (TPH-Jet A) ranges by Ecology Method NWTPH-Dx.

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW211S-200810	20H0099-01	all
RGW224S-200810	20H0099-02	all
RGW221S-200810	20H0099-03	all
RGWDUP3-200810	20H0099-04	all

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in EPA guidelines (EPA, 2014).

ARI received the samples on August 10, 2020. The temperatures of the coolers were recorded upon receipt and were less than the maximum acceptable temperature of 6 degrees Celsius.

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Organic analyses

Samples were analyzed for TPH-D plus TPH-O and TPH-Jet A ranges. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS – Acceptable
5. MS/MSD – Acceptable
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during this sampling event, meeting the project frequency requirement of 5 percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate relative percent differences (RPDs) is 30 percent for concentrations greater than five times the reporting limit. The RPD is not calculated for results that are less than five times the reporting limit, as indicated on the table below by "NC." In these cases, the absolute value of the difference between the primary and duplicate result should not exceed the value of the reporting limit. The field duplicate RPDs were within control limits.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (mg/L)	Duplicate Result (mg/L)	Reporting Limit (mg/L)	RPD (%)
RGW224S-200810/ RGWDUP3-200810	TPH-D (C12–C24)	1.08	0.948	0.100	13
	TPH-O (C24–C38)	ND	ND	0.200	NC
	TPH-Jet A (C10–C18)	1.42	1.30	0.100	9

Abbreviations
mg/L = milligrams per liter
NC = not calculated
ND = not detected
RPD = relative percent difference
TPH-D = total petroleum hydrocarbons as diesel
TPH-Jet A = total petroleum hydrocarbons in the Jet A range
TPH-O = total petroleum hydrocarbons as motor oil

7. Reporting Limits and Laboratory Flags – Acceptable

   Analytes diesel and Jet-A in GW221S were flagged with an "E" indicating the concentration exceeded the upper limit of the calibration range. The sample was rerun at a dilution factor of 5, and flagged with a "D" to indicate dilution. The diluted sample results shall be used for reporting purposes.

Overall assessment of data

The table below summarizes the data review. The completeness of ARI work order number 20H0099 is 100 percent. Evaluation of the usefulness of these data is based on EPA guidance documents listed in the

introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte
RGW211S-200810	none
RGW224S-200810	none
RGW221S-200810	none
RGWDUP3-200810	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014, U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
AOC-003
ARI Work Order Number: 20H0101

This memo presents the summary data quality review of four primary groundwater samples and one trip blank sample collected on August 10, 2020. The samples were submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were analyzed for vinyl chloride (a volatile organic compound) by U.S. Environmental Protection Agency (EPA) Method 8260D with selected ion monitoring.The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW247S-200810	20H0101-01	vinyl chloride
RGW248I-200810	20H0101-02	vinyl chloride
RGW249S-200810	20H0101-03	vinyl chloride
RGW188S-200810	20H0101-04	vinyl chloride
Trip Blanks	20H0101-05	vinyl chloride

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014).

ARI received the samples on August 10, 2020. The temperature of the cooler was recorded upon receipt and was below the maximum acceptable temperature of 6 degrees Celsius.

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Organic analyses

Samples were analyzed for vinyl chlorise. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable except as noted:

   Five sampling vials contained a bubble upon arrival at ARI. The samples were able to be analyzed normally with acceptable results. The data is not qualified for use.

2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable

   Extra volume was not submitted for analysis of MS/MSD samples. The project frequency requirement was achieved with MS/MSD analysis conducted at other sites included in this sampling event.

6. Field Duplicates – Acceptable

   Field duplicates were not collected at this site during this sampling event. The project frequency requirement of one field duplicate for every 20 samples was achieved with field duplicate samples collected at other sites included in this sampling event

7. Reporting Limits and Laboratory Flags – Acceptable

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order number 20H0101 is 100 percent. The usefulness of these data was evaluated based on EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits.

Sample ID	Qualified Analyte
RGW247S-200810	none
RGW248I-200810	none
RGW249S-200810	none
RGW188S-200810	none
Trip Blanks	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

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Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
AOC-004
ARI Work Order Number: 20H0126

This memo presents the summary data quality review of one primary groundwater sample collected on August 12, 2020. The sample was submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology. The sample was analyzed for total lead by U.S. Environmental Protection Agency (EPA) Method 6020A.

The sample and the analyses conducted on the sample are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW250S-200812	20H0126-01	total lead

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014).

ARI received the samples on August 12, 2020. The temperature of the cooler was recorded upon receipt and was below the maximum acceptable temperature of 6 degrees Celsius (°C).

Inorganic analyses

Samples were analyzed for total lead. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. LCS – Acceptable

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4. MS/MSD – Acceptable

   Additional sample volume for MS/MSD analyses was not submitted with samples collected from this site. MS/MSD results were reported with samples not associated with project samples; therefore, sample results are evaluated based on LCS/LCSD results. Project-specific MS/MSD requirements were met with samples collected at other sites included in this sampling event. The laboratory reported MS/MSD results; but project samples are not evaluated using this data since the spiked sample was not a project sample.

5. Field Duplicates – Acceptable

   Field duplicates were not collected at this site during this sampling event. The project frequency requirement of one field duplicate for every 20 samples was achieved with field duplicate samples collected at other sites included in this sampling event.

6. Reporting Limits and Laboratory Flags – Acceptable

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order number 20H0126 is 100 percent. The usefulness of these data was evaluated based on EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits.

Sample ID	Qualified Analyte
RGW250S-200812	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
AOC-060
ARI Work Order Numbers: 20H0118

This memo presents the summary data quality review of six primary groundwater samples, one field duplicate, and one trip blank sample collected on August 11, 2020. The samples were submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were selectively analyzed for the following:

- Volatile organic compounds (VOCs) (cis-1,2-dichloroethene, trichloroethene, and vinyl chloride) by U.S. Environmental Protection Agency (EPA) Method 8260D with selected ion monitoring; and
- Total organic carbon (TOC) by Standard Method 5310B-00.

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGWDUP4-200811	20H0118-01	all
RGW014S-200811	20H0118-02	all
RGW012S-200811	20H0118-03	all
RGW009S-200811	20H0118-04	all
RGW147S-200811	20H0118-05	all
RGW150S-200811	20H0118-06	all
RGW253I-200811	20H0118-07	all
Trip Blanks-200811	20H0118-08	VOCs

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Hold times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and

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reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in EPA guidelines (EPA, 2014a and b).

Samples were received by ARI on August 11, 2020. The temperatures of the coolers were recorded upon receipt and were below the maximum acceptable temperature of 6º Celsius.

Organic analyses

Samples were analyzed for VOCs. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable
6. Field Duplicates – Acceptable

   One field duplicate was submitted for each analysis during this sampling event, meeting the project frequency requirement of five percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate relative percent differences (RPDs) is 30 percent for concentrations greater than five times the reporting limit. The RPD is not calculated for results that are less than five times the reporting limit, as indicated on the table below by "NC." In these cases, the absolute value of the difference between the primary and duplicate result should not exceed the value of the reporting limit. The field duplicate RPDs were within the control limits.

Sample ID/ Field Duplicate ID	Analyte	Primary Result (ng/L)	Duplicate Result (ng/L)	Reporting Limit (ng/L)	RPD (%)
RGW014S-200811/ RGWDUP4-200811	vinyl chloride	190	191	20.0	<1
	cis-1,2-dichloroethene	93.2	90.8	20.0	3
	trichloroethene	ND	ND	20.0	NC

Abbreviations
ng/L = nanograms per liter
NC = not calculated
ND = not detected
RPD = relative percent difference

7. Reporting Limits and Laboratory Flags – Acceptable

Inorganic analyses

Samples were analyzed for TOC. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable

2. Blanks – Acceptable
3. LCS – Acceptable
4. MS – Acceptable
5. Laboratory Duplicates – Acceptable
6. Field Duplicates – Acceptable

   One field duplicate was submitted for TOC analysis during this sampling event, meeting the project frequency requirement of five percent, or one for every 20 samples. Primary and duplicate results are summarized in the table below. The project-specific control limit for field duplicate RPDs is 30 percent for concentrations greater than five times the reporting limit. The field duplicate RPD was within the control limits

Sample ID/ Field Duplicate ID	Analyte	Primary Result (mg/L)	Duplicate Result (mg/L)	Reporting Limit (mg/L)	RPD (%)
RGW014S-200811/ RGWDUP4-200811	TOC	4.39	4.43	0.50	<1

Abbreviations
mg/L = milligrams per liter
RPD= relative percent difference
TOC = total organic carbon

7. Reporting Limits – Acceptable

Overall assessment of data

A summary of the data assessment is presented in the table below. The completeness of work order number 20H0118 is 100 percent. Evaluation of the usefulness of these data is based on the EPA guidance document listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte
RGWDUP4-200811	none
RGW014S-200811	none
RGW012S-200811	none
RGW009S-200811	none
RGW147S-200811	none
RGW150S-200811	none
RGW253I-200811	none
Trip Blanks-200811	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014a, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2014b, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

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Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
Fax:	(206) 342-1761		
Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
AOC-090
ARI Work Order Number: 20H0127

This memo summarizes the data quality review of five primary groundwater samples and a trip blank sample collected on August 12, 2020. The samples were submitted to Analytical Resources, Inc. (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology (Ecology). The samples were selectively analyzed for the following:

- Volatile organic compounds (VOCs) (acetone, methylene chloride, trans-1,2-dichlorethene, cis-1,2-dichloroethene, chloroform, carbon tetrachloride, benzene, toluene, and 1,1,2-trichloroethane) by U.S. Environmental Protection Agency (EPA) Method 8260D;
- VOCs (vinyl chloride, 1,1-dichloroethene, trichloroethene, tetrachloroethene, and 1,1,2,2-tetrachloroethane) by EPA Method 8260D with selected ion monitoring (SIM);
- Total petroleum hydrocarbons in the gasoline range (TPH-G) by Ecology Method NWTPH Gx;
- Total petroleum hydrocarbons in the diesel and motor oil ranges (TPH-D and TPH O) by Ecology Method NWTPH-Dx (with silica gel cleanup).

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW208S-200812	20H0127-01	Vinyl chloride w/ SIM
RGW178S-200812	20H0127-02	Vinyl chloride w/ SIM
RGW189S-200812	20H0127-03	VOCs and TPH
RGW207S-200812	20H0127-04	Vinyl chloride w/ SIM
RGW176S-200812	20H0127-05	Vinyl chloride w/ SIM
TripBlanks-200812	20H0127-06	All

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan Addendum (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the

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laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS), laboratory duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in EPA guidelines (EPA, 2014).

ARI received the samples on March 12, 2020. The temperatures of the coolers were recorded upon receipt and were less than the maximum acceptable temperature of 6 degrees Celsius (ºC).

Organic analyses

Samples were analyzed for VOCs and TPH. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable except as noted:

   The MS/MSD sample had one surrogate above control limits for percent recovery, indicating a slight positive bias for the VOCs in this analysis. The data is not qualified for use.
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable except as noted:

   The percent recovery in the MS/MSD sample was above control limits for multiple VOC analytes. The LCS/LCSD samples were within control limits for the same analytes, therefore the variation is likely due to matrix effect. The data is not qualified for use.
6. Field Duplicates – Acceptable

   Field duplicates were not collected at this site during this sampling event. The project frequency requirement of one field duplicate for every 20 samples was achieved with field duplicate samples collected at other sites included in this sampling event.
7. Reporting Limits and Laboratory Flags – Acceptable

Overall assessment of data

The completeness of ARI work order numbers 20H0127 is 100 percent. Evaluation of the usefulness of these data was evaluated based on EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data, as qualified, meet the project's data quality objectives.

A summary of the data quality review is presented in the table below.

Sample ID	Qualified Analyte
RGW208S-200812	none
RGW178S-200812	none

Sample ID	Qualified Analyte
RGW189S-200812	none
RGW207S-200812	none
RGW176S-200812	none
TripBlanks-200812	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

Memo

To:	Kathleen Goodman, Project Manager	Project:	PS20203450.2020
From:	Chelsea Foster	c:	Project File
Tel:	(206) 342-1760		
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Date:	September 25, 2020		

Subject: Summary Data Quality Review
August 2020 Boeing Renton Groundwater Sampling
Apron A
ARI Work Order Number: 20H0102

This memo presents the summary data quality review of one primary groundwater sample and one trip blank sample collected on August 10, 2020. The samples were submitted to Analytical Resources, Inc., (ARI), located in Tukwila, Washington, a laboratory accredited by the Washington State Department of Ecology. The samples were analyzed for the following:

- Volatile organic compounds (VOCs) (vinyl chloride and cis-1,2-dichloroethene) by U.S. Environmental Protection Agency (EPA) Method 8260D; and
- Total organic carbon (TOC) by Standard Method 5310B.

The samples and the analyses conducted on the samples are listed below.

Sample ID	Laboratory Sample ID	Requested Analyses
RGW264S-200810	20E0102-01	all
Trip Blanks-200810	20E0102-02	VOCs

Data were reviewed in accordance with the appropriate method procedures and criteria documented in the Quality Assurance Project Plan (QAPP) (Amec Foster Wheeler, 2016). The control limits provided in the QAPP are advisory limits; therefore, the most current control limits provided by the laboratory were used to evaluate the quality control data. In cases where the laboratory did not track limits for an analyte, the limits in the QAPP were used.

Holding times, method/trip blanks, surrogate recoveries, laboratory control samples (LCS) and laboratory control sample duplicates (LCSD), matrix spike/matrix spike duplicates (MS/MSD), field duplicates, and reporting limits were reviewed where available to assess compliance with applicable methods. If qualification was required, data were qualified based on the definitions and use of qualifying flags outlined in the EPA guidance documents (EPA, 2014a and b).

ARI received the samples on August 10, 2020. The temperature of the coolers were recorded upon receipt and was below the maximum acceptable temperature of 6 degrees Celsius. The laboratory logged the samples with the time on the chain-of-custody and proceeded with analysis.

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Organic analyses

Samples were analyzed for VOCs. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. Surrogates – Acceptable
4. LCS/LCSD – Acceptable
5. MS/MSD – Acceptable

   Extra volume was not submitted for project specific MS/MSD analyses. Sample precision is evaluated based on LCS and LCSD recoveries. The MS/MSD project frequency requirement of one MS/MSD for every 20 samples was achieved with extra volume submitted at other sites included in this sampling event.
6. Field Duplicates – Acceptable

   Field duplicates were not collected at this site during this sampling event. The project frequency requirement of one field duplicate for every 20 samples was achieved with field duplicate samples collected at other sites included in this sampling event
7. Reporting Limits and Laboratory Flags – Acceptable.

Inorganic analyses

Samples were analyzed for TOC. Laboratory data were evaluated for the following parameters:

1. Preservation and Holding Times – Acceptable
2. Blanks – Acceptable
3. LCS – Acceptable
4. MS/MSD – Acceptable

   Extra volume was not submitted for project specific MS/MSD analyses. Sample precision is evaluated based on LCS and LCSD recoveries. The MS/MSD project frequency requirement of one MS/MSD for every 20 samples was achieved with extra volume submitted at other sites included in this sampling event.
5. Laboratory Duplicates – Acceptable
6. Field Duplicates – Acceptable

   Field duplicates were not collected at this site during this sampling event. The project frequency requirement of one field duplicate for every 20 samples was achieved with field duplicate samples collected at other sites included in this sampling event
7. Reporting Limits and Laboratory Flags – Acceptable.

Overall assessment of data

The table below summarizes the data assessment. The completeness of work order number 20H0102 is 100 percent. The usefulness of these data was evaluated based on EPA guidance documents listed in the introduction to this report. Few problems were identified, and analytical performance was generally within specified limits. The data meet the project's data quality objectives.

Sample ID	Qualified Analyte
RGW264S-200810	none
Trip Blanks-200810	none

References

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington: Prepared for the Boeing Company, February.

U.S. Environmental Protection Agency (EPA), 2014a, U.S. EPA National Functional Guidelines for Superfund Organic Methods Data Review: EPA 540-R-014-002, August.

EPA, 2014b, U.S. EPA National Functional Guidelines for Inorganic Superfund Data Review: EPA 540-R-013-001, August.

Appendix D

TABLE D-1: SWMU-168 HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1]
Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level [3]	Well ID [2]																								
		CPOC Area																								
		GW229S								GW230I									GW231S							
		11/7/2016	3/1/2017	8/14/2017	3/5/2018	8/13/2018	3/4/2019	8/12/2019	3/9/2020	11/7/2016	3/1/2017	8/14/2017	3/5/2018	8/13/2018	3/4/2019	8/12/2019	3/9/2020	8/10/2020	11/7/2016	3/1/2017	8/14/2017	3/5/2018	8/13/2018	3/4/2019	8/12/2019	3/9/2020
Volatile Organic Compounds (µg/L)																										
Vinyl Chloride	0.11	0.020 U	0.020 U	0.021	0.0273	0.020 U	0.0211	0.020 U	0.020 U	0.032	0.020 U	**0.20**	0.0873	**0.14**	0.0566	**0.336**	0.087	**0.162**	0.020 U	0.020 U	0.020 U	0.0393	0.0326	0.0327	0.026	0.020 U

Notes:
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations:
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
SWMU = solid waste management unit

TABLE D-2: SWMU-172 AND SWMU-174 GROUP HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID[3]																			
		Source Area																			
		GW152S										GW153S									
		5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020	5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020
Volatile Organic Compounds (µg/L)																					
cis-1,2-Dichloroethene	0.03	**0.348**	**0.981**	**1.7**	**0.678**	**0.655**	**0.627**	**0.530**	**0.892**	**0.719**	**1.66**	**0.0649**	**0.171**	**0.238**	**0.107**	**0.108**	**0.278**	**0.204**	**0.0736**	**0.0789**	**0.0551**
Tetrachloroethene	0.02	**1.39**	**1.09**	**0.846**	**0.086**	**0.0594**	**0.176**	**0.384**	**1.12**	**2.38**	**0.319**	0.020 U	**0.0845**	**0.370**	0.020 U	0.020 U	**0.0544**	**0.164**	**0.024**	0.020 U	0.020 U
Trichloroethene	0.02	**0.226**	**0.833**	**0.223**	**0.152**	**0.157**	**0.203**	**0.145**	**0.278**	**0.412**	**0.579**	0.020 U	**0.241**	**0.394**	0.020 U	**0.0212**	**0.0326**	**0.131**	0.02 U	0.020 U	0.020 U
Vinyl Chloride	0.11	0.0972	**0.187 J**	**0.246**	**0.128**	**0.173**	0.0705	0.0366	**0.15**	0.0463	**0.284**	**0.313 J**	**0.248**	**0.289**	**0.333**	**0.242**	**0.153**	0.0859	**0.249**	**0.266**	**0.135**
Total Metals (µg/L)																					
Arsenic	1.0	**2.99 J**	**75.7**	**22.6**	**7.54**	**4.49**	**23.4**	**7.48**	**3.84**	**1.95**	**6.72**	**3.51**	**5.67**	**7.84**	**4.49**	**5.97**	**4.72**	**11.9**	**5.48**	**3.85**	**4.05**
Copper	3.5	2.86	**24.1**	**4.76**	**5.12**	2.35	**21.8**	**16.6**	**8.03**	**2.76**	**7.45 J**	1.01	2.55	**16.2**	2.00	1.25	1.58	**10.2**	3.09	1.73	1.68
Lead	1.0	**1.52 J**	**12.7**	**2.48 J**	**3.33**	**1.26**	**14.8**	**12.1**	**6.13**	**1.09**	**3.89**	0.207	**3.06**	0.381	0.352	0.198	0.351	**2.76**	0.712	0.372	0.326

Analyte	Current Cleanup Level[4]	Well ID[3]																			
		Downgradient Plume Area																			
		GW081S										GW172S									
		5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020	
Volatile Organic Compounds (µg/L)																					
cis-1,2-Dichloroethene	0.03	**0.0311**	0.0243	**0.0327**	**0.0355**	0.025	0.0282	**0.0311**	**0.0357**	**0.041**	**0.641**	**0.129**	**0.116**	**0.111**	**0.0581**	0.027	**0.0561**	**0.305**	**0.214**	**0.0561**	
Tetrachloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.0663**	0.020 U	0.020 U	0.020 U	0.020 U	**0.0376**	0.020 U	0.020 U	**0.0451**	**0.0287**	**0.976**	**0.0625**	**0.0603**	
Trichloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.0872**	**0.0370**	0.020 U	0.020 U	0.020 U	0.020 U	**0.384**	**0.028**	0.020 U	
Vinyl Chloride	0.11	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**1.41**	**1.24**	0.0742	**0.167**	0.0808	0.0376	0.0905	**0.209**	**0.369**	0.0628	
Total Metals (µg/L)																					
Arsenic	1.0	**1.63**	**2.30**	**2.20**	**2.33**	**2.49**	**2.49**	**2.69**	**1.87**	**2.03**	**5.52**	**8.84**	**7.24**	**6.52**	**7.71**	**10.6**	**20.5**	**32.8**	**7.03**	**10.8**	
Copper	3.5	0.534	0.811	0.561	0.536	0.546	1.38	1.96	0.791	1.24	0.989	2.50 U	1.77	2.07	2.13	**3.86**	**9.25**	**27.6**	**2.2**	**6.12**	
Lead	1.0	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.116	0.210	0.100 U	0.147	0.772	**1.02**	**1.13**	0.774	0.991	**1.02**	**7.44**	**15.1**	**1.07**	**2.58**	

Analyte	Current Cleanup Level[4]	Well ID[3]																			
		Downgradient Plume Area																			
		GW173S										GW226S									
		5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020	3/5/2018	5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020
Volatile Organic Compounds (µg/L)																						
cis-1,2-Dichloroethene	0.03	0.020 U	**0.111**	**0.0753**	**0.0756**	**0.037**	0.022	**0.0378**	**0.0504**	**0.0488**	**0.0313**	**0.0408**	**0.0401**	0.0262	0.020 U	**0.0387**	0.0223	0.0259	0.0235	**0.0396**	**0.0305**	0.0218
Tetrachloroethene	0.02	**0.061**	**0.0301**	**0.218**	**0.0842**	**0.0416**	**0.0561**	**0.0246**	**0.0224**	0.020 U	0.020 U	0.020 U	0.020 U	**0.0733**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.0279**
Trichloroethene	0.02	**0.0344**	**0.0681**	**0.206**	**0.149**	**0.0742**	**0.0256**	**0.0379**	**0.0305**	**0.0215**	**0.0239**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.11	0.046	0.0969 J	0.0448 J	0.0312	0.0486	0.0613	0.072	0.144	0.126	0.0455	0.0428	0.026	0.0409 J	0.0655	0.0432	0.0459	0.029	0.0615	0.038	0.0594	0.0415
Total Metals (µg/L)																						
Arsenic	1.0	**1.80**	**13.0**	**4.59**	**6.72**	**7.38**	**12.2**	**15.6**	**11.8**	**6.72**	**7.00**	**4.14**	**3.27**	**2.78**	**3.44**	**5.07**	**2.97**	**2.85**	**12.0**	**4.88**	**3.33**	**4.93**
Copper	3.5	3.48	**6.95**	**3.85**	**4.38**	1.11	1.39	**4.68**	1.51	0.875	3.19	2.60	1.05	1.19	2.28	**4.55**	0.500 U	0.626	**15.6**	**5.00**	0.704	1.48
Lead	1.0	0.314	**2.88**	0.706	0.712	0.251	0.290	**1.36**	0.442	0.215	0.470	0.297	0.129	0.141	0.422	0.413	0.100 U	0.100 U	**2.43**	0.500	0.190	0.136

TABLE D-2: SWMU-172 AND SWMU-174 GROUP HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1, 2]
Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID[3]																		
		CPOC Area																		
		GW232S										GW233I								
		5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020	5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020
Volatile Organic Compounds (µg/L)																				
cis-1,2-Dichloroethene	0.03	**0.367**	**0.489**	**0.426**	**0.250**	**0.319**	**0.378**	**0.659**	**0.221**	**0.352**	**0.482**	**0.0598**	**0.0587**	**0.0692**	**0.075**	**0.054**	**0.0697**	**0.0546**	**0.0552**	**0.0646**
Tetrachloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Trichloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	**0.0331**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.0225**	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.11	**0.419**	**0.544 J**	**0.564**	**0.242**	**0.348**	**0.412**	**0.860**	**0.264**	**0.337**	**0.425**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total Metals (µg/L)																				
Arsenic	1.0	**5.36**	**6.52**	**8.01**	**5.12**	**3.96**	**6.29**	**8.09**	**2.73**	**4.71**	**3.83**	0.532	0.421	0.481	0.529	0.428	0.397	0.594	0.467	0.527
Copper	3.5	0.500 U	0.628	**13.3**	1.70	1.15	0.878	**3.85**	2.22	0.539	0.627	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.774	0.500 U	0.597
Lead	1.0	0.100 U	0.275	0.338	0.167	0.167	0.102	0.378	0.354	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.102	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U

Analyte	Current Cleanup Level[4]	Well ID[3]																			
		CPOC Area																			
		GW234S										GW235I									
		5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020	5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020
Volatile Organic Compounds (µg/L)																					
cis-1,2-Dichloroethene	0.03	**0.0672**	**0.0758**	**0.112**	**0.0869**	**0.0630**	**0.0738**	**0.0850**	**0.0984**	**0.092**	**0.0914**	**0.166**	**0.121**	**0.158**	**0.135**	**0.109**	**0.0638**	**0.109**	**0.127**	**0.156**	**0.104**
Tetrachloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Trichloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.0297**	0.020 U	0.020 U	**0.0253**	**0.0305**	**0.0338**	**0.0353**	**0.0342**	0.020 U	**0.0287**	**0.0336**	**0.031**	**0.0227**
Vinyl Chloride	0.11	0.020 U	0.0282 J	0.0488	0.0273	0.0235	0.0252	0.0309	0.0302	0.032	0.0279	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total Metals (µg/L)																					
Arsenic	1.0	0.820	**2.07**	**1.72**	**2.11**	**2.22**	**1.31**	**10.1**	**27.4**	**5.31**	**3.26**	0.200 U	0.200 U	0.230	0.200 U	0.403	0.292	0.237	0.251	0.289	0.288
Copper	3.5	NA	0.748	1.27	1.75	1.93	0.869	**33.2**	**32.9**	2.43	3.21	0.500 U	0.500 U	0.500 U	0.500 U	1.58	0.714	0.573	0.935	1.08	1.30
Lead	1.0	NA	0.425	0.781	0.701	0.843	0.280	**15.5**	**11.8**	0.671	**1.25**	0.100 U	0.100 U	0.104	0.322	0.405	0.182	0.127	0.235	0.223	0.304

Analyte	Current Cleanup Level[4]	Well ID[3]									
		CPOC Area									
		GW236S									
		5/7/2018	8/13/2018	11/12/2018	3/4/2019	5/6/2019	8/12/2019	11/11/2019	3/9/2020	5/11/2020	8/10/2020
Volatile Organic Compounds (µg/L)											
cis-1,2-Dichloroethene	0.03	0.0297	**0.0427**	**0.0690**	**0.0443**	0.0281	**0.0468**	**0.108**	0.0241	**0.036**	**0.0881**
Tetrachloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Trichloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	**0.0206**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.11	0.020 U	0.020 U	0.0323	0.020 U	0.020 U	0.020 U	0.0437	0.020 U	0.020 U	0.020 U
Total Metals (µg/L)											
Arsenic	1.0	**1.80**	**2.69**	**3.35**	**2.81**	**2.10**	**3.70**	**36.5**	**6.29**	**2.10**	**10.1**
Copper	3.5	2.05	0.500 U	0.924	0.919	2.17	0.893	**66.9**	**21.2**	**4.24**	**10.8**
Lead	1.0	**2.49**	0.874	**1.48**	**1.94**	**1.90**	**1.53**	**117**	**18.7**	**2.61**	**10.8**

Notes
1. Data qualifiers are as follows:
U = The analyte was not detected at the reporting limit indicated.
J = The value is an estimate.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
SWMU = solid waste management unit

TABLE D-3: BUILDING 4-78/79 SWMU/AOC GROUP HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]
Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID[3]																													
		Source Area																													
		GW031S										GW033S										GW034S									
		5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/11/2020	5/11/2020	8/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/11/2020	5/11/2020	8/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/11/2020	5/11/2020	8/11/2020
Volatile Organic Compounds (µg/L)																															
Benzene	0.80	**8.95**	**3.21**	**28.3 J**	**55.9**	**7.13**	**3.47**	**4.77**	**37.1**	**17.6**	**1.72 J**	**12.8**	**13.3**	**13.6**	**11.7**	**12.5**	**10.4**	**11.5**	**10.2**	**9.75**	**12.5**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	0.70	0.20 U	0.56 J	0.63 J	0.20 U	0.43	0.47	0.40	0.61	0.40 J	0.67 J	**40.7**	**1.94**	**9.35**	**0.79**	0.41	**0.78**	**2.78**	**21.4**	**39.5**	**188**	0.20 U	0.21	0.25	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	0.23	**1.13**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 UJ	**0.40 U**	0.20 U	**1.00 U**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.25**	**0.29**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Vinyl Chloride	0.20	0.20 U	**0.28**	**0.31 J**	0.20 U	**0.29**	**0.21**	**0.25**	0.20 U	0.20 U	**0.32 J**	**110**	**6.46**	**36.7**	**3.26**	**0.53**	**1.16**	**13.0**	**52.2**	**87.3**	**310**	**0.24**	**0.53**	**0.54**	0.20	0.20 U	**0.39**	**0.39**	0.20 U	**0.21**	**0.41**
Total Petroleum Hydrocarbons (µg/L)																															
TPH-G (C7-C12)	800	**917**	**1,640**	**2,010**	**4200**	**1020**	**1390**	**1540**	**2,980**	**1,880**	**1,160**	239	258	500 U	395	297	277	347	296	301	255	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U

Analyte	Current Cleanup Level[4]	Well ID[3]																													
		Source Area																													
		GW039S									GW243I									GW244S											
		5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/11/2020	5/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/11/2020	5/11/2020	8/11/2020		
Volatile Organic Compounds (µg/L)																															
Benzene	0.80	0.20 U	0.20 U	0.20 U	0.20 U	0.21	0.20 U	0.20 U	0.20 U	0.20 U	**1.66**	0.34	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**3.63**	**4.64**	**2.95**	**1.73**	**1.47**	**1.77**	**0.87**	0.52	0.46	0.43		
cis-1,2-Dichloroethene	0.70	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.80**	0.44	0.26	0.82	**2.03**	0.37	0.20 U	0.68	**1.06**	**1.12**		
Trichloroethene	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.92**	0.20 U	0.20 U	0.22	0.20 U	0.20 U	0.20 U	0.23	0.20 U	0.20 U		
Vinyl Chloride	0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.06**	**0.62**	**0.55**	**0.86**	**1.45**	**0.71**	**0.35**	**0.7**	**0.85**	**0.98**		
Total Petroleum Hydrocarbons (µg/L)																															
TPH-G (C7-C12)	800	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	132	100 U	106	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U		

Analyte	Current Cleanup Level[4]	Well ID[3]																													
		Downgradient Plume Area																													
		GW038S									GW209S									GW210S											
		5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/11/2020	5/11/2020			
Volatile Organic Compounds (µg/L)																															
Benzene	0.80	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.28	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U			
cis-1,2-Dichloroethene	0.70	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U			
Trichloroethene	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U			
Vinyl Chloride	0.20	0.20 U	0.20 U	0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.21**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U			
Total Petroleum Hydrocarbons (µg/L)																															
TPH-G (C7-C12)	800	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U			

Analyte	Current Cleanup Level[4]	Well ID[3]																													
		CPOC Area																													
		GW143S										GW237S										GW238I									
		5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	8/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	8/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	
Volatile Organic Compounds (µg/L)																															
Benzene	0.80	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**8.57**	0.43	**0.93**	**9.58**	**2.20**	0.43	0.66	**3.48**	**1.03**	0.24	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
cis-1,2-Dichloroethene	0.70	0.33	**1.82**	0.20 U	0.20 U	0.20 U	**2.20**	0.20 U	0.21	0.20 U	**1.17**	0.20 U	0.20 U	0.20 U	0.21	0.20 U	0.25	0.22	**1.00 U**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
Trichloroethene	0.23	0.20 U	**0.60**	0.20 U	0.20 U	0.20 U	**1.05**	0.20 U	0.20 U	0.20 U	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1.00 U**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
Vinyl Chloride	0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**1,740**	499	100 U	**1,680**	100 U	329	100 U	**961**	729	100 U	100 U	100 U	100 U	**0.21**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Total Petroleum Hydrocarbons (µg/L)																															
TPH-G (C7-C12)	800	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U

Analyte	Current Cleanup Level[4]	Well ID[3]																													
		CPOC Area																													
		GW239I									GW240D										GW241S										
		5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	5/7/2018	8/14/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	8/11/2020	5/7/2018	8/13/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020		
Volatile Organic Compounds (µg/L)																															
Benzene	0.80	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		
cis-1,2-Dichloroethene	0.70	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		
Trichloroethene	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		
Vinyl Chloride	0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.23**	**0.23**	**0.24**	**0.23**	**0.27**	**0.26**	**0.24**	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U		
Total Petroleum Hydrocarbons (µg/L)																															
TPH-G (C7-C12)	800	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U		

Analyte	Current Cleanup Level[4]	Well ID[3]									
		CPOC Area									
		GW242I									
		5/7/2018	8/13/2018	11/13/2018	3/5/2019	5/7/2019	8/13/2019	11/12/2019	3/10/2020	5/11/2020	
Volatile Organic Compounds (µg/L)											
Benzene	0.80	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
cis-1,2-Dichloroethene	0.70	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
Trichloroethene	0.23	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
Vinyl Chloride	0.20	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	
Total Petroleum Hydrocarbons (µg/L)											
TPH-G (C7-C12)	800	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	

Notes
1. Data qualifiers are as follows:
U = The analyte was not detected at the reporting limit indicated.
UJ = The result is estimated and was not detected at the reporting limit indicated.
J = The value is an estimate.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well; D = deep well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
SWMU = solid waste management unit
TPH-G = total petroleum hydrocarbons as gasoline

TABLE D-4: FORMER FUEL FARM HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID[3]																	
		Source Area									CPOC Area								
		GW255S									GW183S								
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020	5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020
Total Petroleum Hydrocarbons (mg/L)																			
TPH-D (C12-C24)	0.5	0.094 U	0.095 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.095 U	0.096 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.110 U
Jet A	0.5	0.094 U	0.095 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.095 U	0.096 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.110 U

Analyte	Current Cleanup Level[4]	Well ID[3]																	
		CPOC Area																	
		GW211S										GW212S							
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020	8/10/2020	5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020
Total Petroleum Hydrocarbons (mg/L)																				
TPH-D (C12-C24)	0.5	0.32	**0.75**	0.22	**0.903**	0.272	0.341	0.124	0.120	0.282	0.192	0.12 U	0.095 U	0.094 U	0.100 U	0.100 U	0.109	0.100 U	0.100 U	0.100 U
Jet A	0.5	0.37	**0.58**	0.24	0.245	0.214	0.191	0.117	0.117	0.267	0.155	0.12 U	0.095 U	0.094 U	0.100 U	0.100 U	0.108 U	0.100 U	0.100 U	0.100 U

Analyte	Current Cleanup Level[4]	Well ID[3]																	
		CPOC Area																	
		GW224S										GW256S							
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020	8/10/2020	5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020
Total Petroleum Hydrocarbons (mg/L)																				
TPH-D (C12-C24)	0.5	**1.2**	**1.4**	**0.73**	**1.84**	**0.560**	**1.56**	**0.256**	**1.46**	**0.675**	**1.08**	0.094 U	0.095 U	0.096 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Jet A	0.5	**2.3**	**2.2**	**1.4**	**1.97**	**0.933**	**1.64**	**0.388**	**1.80**	**0.918 J**	**1.42**	0.11	0.095 U	0.096 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U

Analyte	Current Cleanup Level[4]	Well ID[3]								
		CPOC Area								
		GW258S								
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020
Total Petroleum Hydrocarbons (mg/L)										
TPH-D (C12-C24)	0.5	0.095 U	0.095 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Jet A	0.5	0.095 U	0.095 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U

TABLE D-4: FORMER FUEL FARM HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]
Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID[3] (continued)								
		CPOC Area (continued)								
		GW184S								
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020
Total Petroleum Hydrocarbons (mg/L)										
TPH-D (C12-C24)	0.5	0.095 U	0.096 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Jet A	0.5	0.095 U	0.096 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U

Analyte	Current Cleanup Level[4]	Well ID[3] (continued)									
		CPOC Area (continued)									
		GW221S									
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020	8/10/2020
Total Petroleum Hydrocarbons (mg/L)											
TPH-D (C12-C24)	0.5	**0.64**	**0.63**	**0.55**	**3.63**	**0.746**	**1.50**	**0.630**	**1.65**	**1.58**	**7.67**
Jet A	0.5	**0.58**	**0.52**	0.48	**2.12**	**0.635**	**0.863**	**0.397**	**1.09**	**1.09**	**5.70**

Analyte	Current Cleanup Level[4]	Well ID[3] (continued)								
		CPOC Area (continued)								
		GW257S								
		5/5/2016	11/7/2016	5/10/2017	11/14/2017	5/7/2018	11/12/2018	5/7/2019	11/11/2019	5/11/2020
Total Petroleum Hydrocarbons (mg/L)										
TPH-D (C12-C24)	0.5	0.095 U	0.095 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Jet A	0.5	0.095 U	0.095 U	0.095 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U

Notes
1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = The value is an estimate.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations
AOC = area of concern
CPOC = conditional point of compliance
mg/L = milligrams per liter
SWMU = solid waste management unit
TPH-D = total petroleum hydrocarbons as diesel

TABLE D-5: AOC-003 HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[4]	Well ID [3]															
		Source Area								Downgradient Plume Area							
		GW249S								GW188S							
		3/7/2018	5/8/2018	8/15/2018	#########	3/5/2019	8/14/2019	3/12/2020	8/10/2020	3/7/2018	5/8/2018	8/15/2018	11/13/2018	3/5/2019	8/14/2019	3/12/2020	8/10/2020
Volatile Organic Compounds (µg/L)																	
cis-1,2-Dichloroethene	0.78	0.102	0.0757	0.0524	0.0829	0.079	0.0526	0.0604	NA	0.0606	0.0531	0.0386	0.0636	0.0493	0.0361	0.0362	NA
Tetrachloroethene	0.02	0.0496	0.020 U	0.020 U	0.020 U	0.0105	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.0107	0.020 U	0.0244	NA
Trichloroethene	0.16	0.0475	0.0211	0.020 U	0.020 U	0.0157	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.0125	0.020 U	0.020 U	NA
Vinyl Chloride	0.24	0.114	**0.428**	**0.413**	**0.629**	**0.424**	**0.367**	**0.334**	**0.261**	**0.443**	**0.505**	**0.404**	**0.813**	**0.537**	**0.545**	**0.235**	**0.288**

Analyte	Current Cleanup Level[4]	Well ID [3]																			
		CPOC Area																			
		GW247S										GW248I									
		5/8/2018	8/15/2018	11/13/2018	3/5/2019	5/8/2019	8/14/2019	11/12/2019	3/12/2020	5/13/2020	8/10/2020	5/8/2018	8/15/2018	11/13/2018	3/5/2019	5/8/2019	8/14/2019	11/12/2019	3/12/2020	5/13/2020	8/10/2020
Volatile Organic Compounds (µg/L)																					
cis-1,2-Dichloroethene	0.78	0.0949	0.081	0.102	0.0728	0.0584	0.065	0.0635	0.039	0.584	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.02 U	0.020 U	NA
Tetrachloroethene	0.02	0.020 U	0.020 U	0.020 U	0.126	0.020 U	0.020 U	0.020 U	0.02 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
Trichloroethene	0.16	0.0257	0.0291	0.0208	0.018	0.020 U	0.020 U	0.148	0.02 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0514	0.020 U	0.020 U	NA
Vinyl Chloride	0.24	**0.46**	**0.453**	**0.679**	**0.392**	**0.497**	**0.613**	**0.504**	**0.305**	**0.409**	**0.392**	**0.573**	**0.526**	**0.987**	**0.707**	**0.551**	**0.541**	**0.62**	**0.499**	**0.546**	**0.383**

Notes

1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations

µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
NA = not analyzed
NS = not sampled
SWMU = solid waste management unit

TABLE D-6: AOC-004 HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Level[3]	Well ID [3]								
		Source Area								
		GW250S								
		11/10/2016	3/1/2017	8/17/2017	3/6/2018	8/15/2018	3/5/2019	8/14/2019	3/9/2020	8/12/2020
Metals (mg/L)										
Lead	0.001	**0.0020**	**0.0030**	0.00026	0.000941	**0.00107**	**0.00154**	0.000714	**0.00119**	**0.000611**

Analyte	Current Cleanup Level[3]	Well ID [3]							
		CPOC Area							
		GW174S							
		11/10/2016	3/1/2017	8/17/2017	3/6/2018	8/15/2018	3/5/2019	8/14/2019	3/9/2020
Metals (mg/L)									
Lead	0.001	**0.0013 J**	**0.0016 J**	0.0010	0.000449	0.000762	0.000815	0.000549	0.000974

Notes

1. Data qualifiers are as follows:
   J = The value is an estimate.
2. S = shallow well
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations

mg/L = milligrams per liter
AOC = area of concern
CPOC = conditional point of compliance
SWMU = solid waste management unit

TABLE D-7: AOC-060 HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]
Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Levels [4]	Well ID [3]								
		Source Area								
		GW009S								
		8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/11/2020
Volatile Organic Compounds (µg/L)										
cis -1,2-Dichloroethene	0.08	**0.16**	**0.093**	**0.15**	**0.0948**	**0.126**	**0.107**	**0.127**	**0.093**	**0.124**
Trichloroethene	0.02	**0.032**	**0.022**	**0.033**	**0.0252**	**0.0238**	**0.0239**	0.020 U	**0.0242**	**0.0324**
Vinyl Chloride	0.26	**0.40**	0.26	**0.39**	0.241 J	**0.318**	**0.285**	**0.300**	0.183	0.219

Analyte	Current Cleanup Levels [4]	Well ID [3]																										
		Downgradient Plume Area																										
		GW012S									GW014S									GW147S								
		8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/11/2020	8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/11/2020	8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/11/2020
Volatile Organic Compounds (µg/L)																												
cis -1,2-Dichloroethene	0.08	**5.2**	**1.6**	**0.95**	**0.609**	**1.29**	**1.23**	**0.798**	**0.482**	**0.508**	**0.17**	**0.13**	**0.18**	**0.134**	**0.122**	**0.119**	**0.143**	**0.151**	**0.0932**	**16**	**0.16**	**3.0**	**0.211**	**4.63**	**0.955**	**4.11**	**0.287**	**0.931**
Trichloroethene	0.02	**3.0**	**0.11**	**0.098**	**0.0568**	**0.656**	**0.0546**	**0.0471**	**0.0505**	**0.0518**	**0.025**	**0.043**	**0.039**	**0.0347**	**0.0273**	**0.0254**	0.020 U	**0.0419**	0.020 U	**3.6**	**1.5**	**2.6**	**1.91**	**4.23**	**0.475**	**1.46**	**1.20**	**3.37**
Vinyl Chloride	0.26	**2.5**	**2.0**	**1.4**	**0.586**	**0.605**	**1.35**	**0.893**	**0.603**	**0.387**	**0.30**	**0.30**	**0.31**	**0.266**	0.232 J	0.214	**0.365**	0.195	0.190	**3.1**	0.020 U	0.21	0.020 U	**1.07 J**	0.0514	0.215	0.020 U	0.0643

Analyte	Current Cleanup Levels [4]	Well ID [3]																										
		CPOC Area																										
		GW149S									GW150S									GW252S								
		8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/11/2020	8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020
Volatile Organic Compounds (µg/L)																												
cis -1,2-Dichloroethene	0.08	0.076	0.067	0.070	0.0565	0.0441	0.0623	0.0427	0.0574	**0.10**	0.055	**0.091**	0.0388	0.0506	0.0737	**0.0824**	0.0525	**0.0935**	0.034	0.024	0.039	0.0215	0.0266	0.020 U	0.0342	0.0259
Trichloroethene	0.02	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	**0.022**	0.020 U	**0.026**	0.020 U	**0.0305**	0.020 U	**0.0228**	0.02 U	**0.0291**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.26	0.080	0.11	0.068	0.0854	0.0399	0.0843	0.0482	0.085	0.20	0.092	0.096	0.0596	0.0203	0.103	0.020 U	0.0541	0.0619	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U

Analyte	Current Cleanup Levels [4]	Well ID [3]																
		CPOC Area																
		GW253I									GW254S							
		8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020	8/11/2020	8/23/2016	3/6/2017	8/16/2017	3/6/2018	8/14/2018	3/5/2019	8/14/2019	3/10/2020
Volatile Organic Compounds (µg/L)																		
cis -1,2-Dichloroethene	0.08	**0.089**	**0.10**	**0.11**	**0.0991**	0.0796	**0.127**	**0.0917**	**0.0915**	**0.0879**	**0.11**	0.062	**0.11**	0.0589	**0.0926**	**0.0983**	**0.116**	0.0736
Trichloroethene	0.02	**0.023**	**0.024**	**0.029**	0.020 U	**0.0204**	**0.0221**	0.020 U	**0.0212**	**0.0211**	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.26	0.13	0.13	0.14	0.132	0.113	0.143	0.131	0.184	0.100	0.067	0.038	0.043	0.0303	0.0418	0.0749	0.0465	0.0405

Notes:
1. Data qualifiers are as follows:
U = The analyte was not detected at the reporting limit indicated.
J = The value is an estimate.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.

Abbreviations:
µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
SWMU = solid waste management unit

TABLE D-8: AOC-090 HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Levels [4]	Well ID [3]																								
		Source Area									Downgradient Plume Area															
		GW189S [5]									GW175I								GW176S							
		11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	8/12/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	8/12/2020
Volatile Organic Compounds (µg/L)																										
1,1,2,2-Tetrachloroethane	0.17	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
1,1,2-Trichloroethane	0.2	**1.00 U**	**0.40 U**	0.20 U	0.20 U	**2.00 U**	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
1,1-Dichloroethene	0.057	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.0529	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
Acetone	300	25.1	10.0 U	5.0 U	5.00 U	70	5.00 U	5.0 U	5.0 U	5.00 U	NA	5.00 U	5.0 U	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U	NA	5.00 U	5.38	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U	NA
Benzene	0.8	**1.00 U**	0.41	**1.69**	0.55	**2.42**	0.20	0.49	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Carbon Tetrachloride	0.23	**1.00 U**	**0.40 U**	0.20 U	0.20 U	**2.00 U**	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Chloroform	2	1.00 U	0.40 U	0.20 U	0.20 U	**2.23**	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
cis-1,2-Dichloroethene	2.4	1.16	1.18	2.23	1.74	**22.3**	0.92	**6.87**	0.20 U	1.93	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.25	0.34	0.26	0.27	0.25	0.27	0.25	NA
Methylene Chloride	2	**5.00 U**	2.00 U	1.0 U	1.00 U	**10.9 UJ**	1.00 U	1.0 U	1.0 U	1.00 U	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U	NA
Tetrachloroethene	0.05	**0.0549**	0.020 U	0.020 U	0.020 U	**0.20 U**	0.028	0.020 U	0.0263	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
Toluene	75	13.1	18.7	2.84	6.34	21.7	4.96	3.11	0.20 U	1.05	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.42	0.20 U	0.20 U	0.20 U	0.20 U	NA
trans-1,2-Dichloroethene	53.9	1.00 U	0.56	0.40	0.48	2.00 U	0.20 U	0.39	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Trichloroethene	0.08	**0.19**	**0.156**	**0.279**	**0.224**	**2.38**	**0.156**	**0.414**	0.0745	**0.324**	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
Vinyl Chloride	0.13	0.020 U	**0.48**	**1.00**	**0.508 J**	**2.09 J**	**0.50**	**1.20**	0.020 U	**0.369**	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	**0.260**	**0.286**	**0.208**	**0.230**	**0.294**	**0.301**	**0.207**	**0.232**
Total Petroleum Hydrocarbons (µg/L)																										
TPH-G (C7-C12)	800	**2,290**	**2,260**	**2,010**	**1,860**	**9,440**	**1,070**	**943**	189	699	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA
TPH-D (C12-C24)	500	146	398	**689**	200	**4,120**	362	432	100 U	150	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA
TPH-O (C24-C40)	500	200 U	**582**	**949**	298	**2,000 U**	**522**	**853**	200 U	379	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA

Analyte	Current Cleanup Levels [4]	Well ID [3]																								
		Shallow Zone CPOC Area																								
		GW178S									GW180S								GW207S							
		11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	8/12/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	8/12/2020
Volatile Organic Compounds (µg/L)																										
1,1,2,2-Tetrachloroethane	0.17	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
1,1,2-Trichloroethane	0.2	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
1,1-Dichloroethene	0.057	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.023	0.020 U	0.020 U	0.020 U	NA
Acetone	300	NA	5.00 U	5.0 U	5.00 U	5.00 U	5.54	5.0 U	5.0 U	NA	NA	5.00 U	5.0 U	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U	NA	5.00 U	5.0 U	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U	NA
Benzene	0.8	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.23	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Carbon Tetrachloride	0.23	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Chloroform	2	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
cis-1,2-Dichloroethene	2.4	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.29	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Methylene Chloride	2	NA	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	NA	NA	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	NA	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	1.00 U	NA
Tetrachloroethene	0.05	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA
Toluene	75	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
trans-1,2-Dichloroethene	53.9	NA	0.20 U	0.26	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA
Trichloroethene	0.08	NA	0.020 U	0.0277	0.0214	0.0213	0.0213	0.020 U	0.021	NA	NA	0.020 U	0.026	0.020 U	0.020 U	0.020 U	0.0239	0.020 U	NA	0.020 U	0.0412	0.020 U	0.0388	0.020 U	0.0305	0.020 U	NA
Vinyl Chloride	0.13	NA	**0.699**	**0.191**	**0.409**	**0.378**	**0.392**	**0.3840**	**0.1840**	**0.141**	NA	0.020 U	0.0395	0.020 U	0.020 U	0.020 U	0.0485	0.020 U	NA	0.0758	**0.2380**	0.0300	**0.311 J**	0.0692	0.020 U	0.020 U	**0.377**
Total Petroleum Hydrocarbons (µg/L)																										
TPH-G (C7-C12)	800	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA
TPH-D (C12-C24)	500	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA
TPH-O (C24-C40)	500	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA

TABLE D-8: AOC-090 HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN[1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Current Cleanup Levels [4]	Well ID [3]																								
		Shallow Zone CPOC Area									Intermediate Zone CPOC Area															
		GW208S									GW163I								GW165I							
		11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	8/12/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020
Volatile Organic Compounds (µg/L)																										
1,1,2,2-Tetrachloroethane	0.17	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,1,2-Trichloroethane	0.2	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	0.057	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Acetone	300	NA	5.00 U	5.0 U	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U	NA	NA	5.00 U	5.0 U	5.00 U	5.00 U	6.90	5.0 U	5.0 U	NA	5.00 U	5.0 U	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U
Benzene	0.8	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Carbon Tetrachloride	0.23	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chloroform	2	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	2.4	NA	0.20 U	0.23	0.20	0.20 U	0.21	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Methylene Chloride	2	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U	NA	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U
Tetrachloroethene	0.05	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Toluene	75	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	53.9	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	0.08	NA	0.020 U	0.0281	0.020 U	0.0234	0.020 U	0.0293	0.020 U	NA	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.13	NA	**0.565**	**0.330**	**0.388**	0.097	**0.437**	**0.245**	**0.419**	**0.343**	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Total Petroleum Hydrocarbons (µg/L)																										
TPH-G (C7-C12)	800	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U
TPH-D (C12-C24)	500	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U
TPH-O (C24-C40)	500	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U

Analyte	Current Cleanup Levels [4]	Well ID [3]																
		Intermediate Zone CPOC Area																
		GW177I								GW179I								
		11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020	11/8/2016	3/2/2017	8/15/2017	3/5/2018	8/13/2018	3/5/2019	8/12/2019	3/11/2020
Volatile Organic Compounds (µg/L)																		
1,1,2,2-Tetrachloroethane	0.17	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
1,1,2-Trichloroethane	0.2	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	0.057	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Acetone	300	NA	5.00 U	7.08	5.00 U	5.00 U	5.00 U	5.0 U	5.0 U	NA	5.00 U	5.0 U	5.00 U	5.00 U	7.16	5.0 U	5.0 U
Benzene	0.8	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Carbon Tetrachloride	0.23	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Chloroform	2	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
cis-1,2-Dichloroethene	2.4	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Methylene Chloride	2	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U	NA	1.00 U	1.0 U	1.00 U	1.00 U	1.00 U	1.0 U	1.0 U
Tetrachloroethene	0.05	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Toluene	75	NA	0.20 U	0.20 U	0.25	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
trans-1,2-Dichloroethene	53.9	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NA	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethene	0.08	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	NA	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U	0.020 U
Vinyl Chloride	0.13	NA	**0.1820**	0.0871	0.0454	0.0303	0.0573	0.0339	0.020 U	NA	0.0632	0.020 U	0.0332	0.020 U	**0.1330**	0.0368	0.020 U
Total Petroleum Hydrocarbons (µg/L)																		
TPH-G (C7-C12)	800	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 U	100 U	100 U
TPH-D (C12-C24)	500	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U	NA	100 U	100 U	100 U	100 U	100 UJ	100 U	100 U
TPH-O (C24-C40)	500	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U	NA	200 U	200 U	200 U	200 U	200 UJ	200 U	200 U

Notes:

1. Data qualifiers are as follows:
   U = The analyte was not detected at the reporting limit indicated.
   J = The value is an estimate.
   UJ = The analyte was not detected at the estimated reporting limit indicated.
2. **Bolded** values exceed the cleanup levels.
3. S = shallow well; I = intermediate well.
4. Current cleanup levels obtained from Table 2 of the Cleanup Action Plan and are based on each individual SWMU or AOC.
5. GW189S is the replacement well for GW168S.

Abbreviations:

µg/L = micrograms per liter
AOC = area of concern
CPOC = conditional point of compliance
NA = well not available for sampling
SWMU = solid waste management unit
TPH-D = total petroleum hydrocarbons as diesel
TPH-G = total petroleum hydrocarbons as gasoline
TPH-O = total petroleum hydrocarbons as oil

TABLE D-9: APRON A HISTORICAL CONCENTRATIONS OF CONSTITUENTS OF CONCERN [1, 2]

Boeing Renton Facility, Renton, Washington

Analyte	Well ID [3]							
	GW262S							
	11/17/2016	5/9/2017	11/14/2017	5/7/2018	11/13/2018	5/7/2019	11/11/2019	5/12/2020
Volatile Organic Compounds (µg/L)								
cis-1,2-Dichloroethene	0.2 U	0.20 U	0.21	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Vinyl Chloride	0.2 U	0.3	0.29	0.25	0.20 U	0.20 U	0.20 U	0.20 U

Analyte	Well ID 3								
	GW264S								
	11/17/2016	5/9/2017	11/14/2017	5/7/2018	11/13/2018	5/7/2019	11/11/2019	5/12/2020	8/10/2020
Volatile Organic Compounds (µg/L)									
cis-1,2-Dichloroethene	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.52
Vinyl Chloride	0.2 U	3.4	0.97	1.63	0.55	1.39	0.38	1.48	0.20 U

Notes:

1. Data qualifiers are as follows:

U = The analyte was not detected at the reporting limit indicated.

3. S = shallow well

Abbreviations:

µg/L = micrograms per liter

Appendix E

APPENDIX E

Summary of Remedial Actions at the Boeing Renton Facility July - September 2020

Boeing Renton Site
Renton, Washington

Prepared for:
The Boeing Company
EHS Remediation

Prepared by:
CALIBRE Systems, Inc.
Project No. T0014323

November 15, 2020

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Acronyms

AOC	Area of Concern
Building 4-78/79	Building 4-78/4-79 SWMU/AOC Group
CALIBRE	CALIBRE Systems, Inc.
CMP	Compliance Monitoring Plan
EDR	Engineering Design Report
ERD	Enhanced Reductive Dechlorination
GAC	granular activated carbon
mg/L	milligrams per liter
PCE	Tetrachloroethene
PID	Photoionization detector
SVE	Soil Vapor Extraction
SWMU	Solid Waste Management Unit
TCE	Trichloroethene
Tech Memo	Technical Memorandum
VOCs	Volatile Organic Compounds
VPC	Vapor Phase Carbon

1.0 Introduction

CALIBRE Systems, Inc. (CALIBRE) prepared this Technical Memorandum (Tech Memo) for the Boeing Company to summarize remedial actions implemented at the Boeing Renton Facility in the third quarter of 2020 (between July 1 and September 30, 2020). The ongoing remedial actions include:

1. Operation of one soil vapor extraction (SVE) system located at Solid Waste Management Unit (SWMU) designated as SWMU-172/174;
2. Biological treatment to promote Enhanced Reductive Dechlorination (ERD) of volatile organic compounds (VOCs) in groundwater underway at several areas of concern (AOCs) located throughout the Renton Facility, and;
3. Anaerobic biodegradation of benzene by nitrate/sulfate injections at the 4-78/79 Building.

CALIBRE completed the work described in this Tech Memo to support remedial activities described in the Engineering Design Report (EDR), (AMEC, 2014) as supplemented by a Tech Memo describing the remedial approach for *in situ* biodegradation treatment of benzene in groundwater near the 4-78/79 Building (CALIBRE 2017).

1.1 Facility Location and Background

The Boeing Renton Facility is used for assembly of 737 airplanes and is located at the southern end of Lake Washington in Renton, Washington. The location of the Renton Facility and the location of SWMU-172/174 within the Facility is shown on Figure 1-1. The locations of the other AOCs and SWMUs where groundwater treatment is ongoing are also presented in Figure 1-1.

1.2 Objectives and Organization

The objective for this Tech Memo is to summarize work completed in accordance with the EDR in the third quarter of 2020. This includes operation and monitoring activities for the SVE system located at SWMU-172/174 and a summary of the ongoing biological treatment and monitoring of groundwater at the following areas:

SWMU-172/174
Building 4-78/4-79 SWMU/AOC Group (Building 4-78/79)
AOC-001/002
AOC-003
Lot 20/Former Building 10-71
AOC-060
AOC-090
Building 4-70, and
Apron A

This Tech Memo is organized as follows:
Section 1 – Introduction and Background

Section 2 – SVE System Operation and Monitoring
Section 3 – Groundwater Treatment
Section 4 – Conclusions and Recommendations
Section 5 – References
Attachment A – Field Data Sheets
Attachment B – Laboratory Data Packages

2.0 SVE Systems Operation and Monitoring

SVE systems were installed in the Building 4-78/79 and SWMU-172/174 areas and began operation in April 2015. During the last quarter of 2017 photoionization detector (PID) results from both systems had shown low-level VOC concentrations removed at asymptotically low levels. Rebound tests were conducted in early 2018 followed by collection of soil confirmation samples from both areas in June 2018. Ecology approved the recommended shutdown of the Building 4-78/79 SVE system on November 1, 2018 after review and evaluation of the soil confirmation results for that area (CALIBRE 2018a). Operational modifications have continued at the SWMU-172/174 SVE system to optimize VOC removal for that area. The following sections summarize the operating conditions, operational changes, and performance monitoring/evaluation for the SWMU-172/174 SVE system performed in the third quarter 2020 (July to September 2020).

2.1 SWMU-172/174 SVE System

The SWMU-172/174 SVE system consists of three vapor extraction wells and a SVE equipment trailer as shown in Figure 2-1. The SVE system is equipped with two vapor-phase granular activated carbon (GAC) vessels, each filled with 1,800 pounds of carbon. The GAC vapor treatment system is configured to run in a lead-lag configuration with vapor from the outlet of the lead vessel passing through the lag vessel. The system historically included two smaller vessels each containing 200 pounds of zeolite impregnated with permanganate for vinyl chloride treatment. Permanganate treatment was originally included in the design to treat potential vinyl chloride that would not be captured in GAC. Monitoring data has demonstrated that vinyl chloride is not present in the inlet air stream and permanganate treatment is not required or providing any benefit and may be discontinued in the future. The lag permanganate drum became plugged during the fourth quarter 2019 and was taken offline. The lead permanganate drum is still operating within the treatment system.

Routine maintenance including oil changes, drive-belt tensioning and inspection, inspection of the air filter, and inspection of the moisture separator was completed per the Operations Manual (CALIBRE, 2014). System monitoring includes regular monitoring of total organic vapor concentrations with a calibrated PID.

2.1.1 TO-15 Laboratory Analysis of Vapor Samples

A total of three samples for TO-15 analysis were collected during this operating period. The results showed tetrachloroethene (PCE) represented an average of approximately 83% of the total VOCs for the SWMU-172/174 SVE system influent, SVE-2 and SVE-3 samples collected in September 2020, similar in distribution to prior monitoring events. Table 2-1 summarizes the TO-15 detections for the SWMU-172/174 SVE system

for 17 TO-15 sampling events[1] that have been implemented since system startup. The samples were analyzed by EuroFins Air Toxics and the laboratory report is included in Attachment B.

2.1.2 Summary of Operations and Operational Changes

The soil confirmation samples collected in the second quarter of 2018 identified a location between SVE-2 and SVE-3 which still showed detectable PCE levels in soil. During subsequent reporting periods, the SVE system has been adjusted to alter the flushing pattern through this area by using SVE-3 as an inlet vent well with continued extraction through SVE-2 and SVE-1 or using SVE-1 as an inlet vent well with continued extraction through SVE-2 and SVE-3. Vapor concentrations, measured with a PID, are monitored following these adjustments and additional modifications to alter the flushing pattern are made when vapor concentrations reduce to previous low-level detections.

During this reporting period, third quarter 2020, the system operated with SVE-1 as an air inlet well with extraction at SVE-2 and SVE-3. PID vapor concentrations were elevated above prior low-level concentrations in July and August at the operating wells and system influent following the system down time during the prior quarter due to COVID-19 health and safety concerns. The subsequent monitoring events in September and October 2020 have shown the PID vapor concentrations begin to drop and level off. Operational changes will be completed in the fourth quarter 2020 in the event these concentrations remain at asymptotic levels. Table 2-2 shows the PID readings for the wells in the SWMU-172/174 SVE system and Table 2-3 shows an operational summary for the system. The operational logs are included in Attachment A.

2.1.3 Mass Removal Estimate

Between April 17, 2015 and September 23, 2020 the SWMU-172/174 SVE system has recovered an estimated 21.0 pounds of VOCs (primarily PCE), as shown in Table 2-3. Approximately 0.66 pounds of VOCs were removed during the current reporting period (third quarter 2020) based on the TO-15 measurements collected while the system was operating. It is likely the PID is picking up other vapors from the paint shop in the 5-09 building; the area around the 5-09 building can at times have a noticeable paint odor. The cumulative VOC mass removal for the SWMU-172/174 SVE system is shown in Figure 2-2.

2.2 Recommended Next Steps for the SVE Systems

Vapor concentrations measured with PID in September and October 2020 show SVE-2, SVE-3, and the system influent are reducing to prior low-level concentrations, following the system downtime/restart in the prior quarter. TO-15 results from September 2020 show total CVOCs are reduced at SVE-3 and the system influent compared to May 2020 rebound samples. If the PID measurements remain at asymptotic levels, the system will be modified to alternate flows between wells as has been done in the past (i.e. SVE-3 is extracting and will be changed to an inlet vent and vice versa for SVE-1). Summa can samples for TO-15

[1] Multiple changes to SVE system operations have been implemented over the period where data are shown. Changes to extraction flow rates by SVE wells are used to maximize the VOC mass removal and the corresponding SVE influent concentration is highly dependent on the flow rate from selected wells.

analysis will be planned for the fourth quarter 2020 to monitor changes in vapor concentrations if observed.

Additional modifications to the operation of this system should be considered to continue increased mass removal in the area between SVE-2 and SVE-3. These modifications may include opening SVE-1 and SVE-3 as an inlet vent or SVE-1 and SVE-2 as an inlet vent, to focus vapor removal in that area. It may also be beneficial to operate the SVE system in a pulsed mode in order to allow vapor concentrations to rebound followed by running the system for a period of time.

3.0 Ongoing Groundwater Treatment

Groundwater treatment is being implemented at several AOCs/SWMUs at the Renton Facility. The primary remedy being implemented is ERD of chlorinated solvents in targeted areas. The ERD treatment involves substrate injection using sucrose as a carbon source to stimulate biological degradation of the chlorinated solvents. Substrate injections were completed at selected wells during this reporting period in August 2020 at SWMU-172/174, Building 4-78/79, AOC-60, AOC-90, Apron A, and AOC-003. The list of wells by area including substrate volume and mass are summarized in Table 3-1.

Beginning in late 2017, anaerobic biodegradation of benzene using nitrate and sulfate injections was implemented for a small area at the 4-78/79 Building. Boeing has continued additional nitrate/sulfate injections in the area; the most recent injection was completed in August 2020 (eighth event) with a target concentration of 1,600 mg/L for nitrate and 800 mg/L for sulfate per well (similar to what was injected in January 2020) to provide additional nitrate and sulfate to the impacted area, see Table 3-2. Performance monitoring was completed at the injection and monitoring wells at this area in September 2020 and those results are summarized in Table 3-3. The results show benzene is below baseline concentrations in seven of the nine wells monitored in this area with reductions ranging from 73% to 97%.

Site-wide groundwater sampling was conducted as part of the quarterly monitoring program during this reporting period and the results are discussed in the main text of the quarterly report. Table 3-4 presents a summary of those groundwater monitoring results, by area, related to groundwater treatment/ERD implementation.

4.0 Conclusions and Recommendations

SVE operations at the SWMU-172/174 were restarted during the prior reporting period following the planned shut down in response to the on-going COVID-19 virus and the Governor's Stay-at-Home Order. Increased vapor concentrations were observed at the system influent following the system restart in May 2020 and were sustained into August 2020 at which point they began to drop to prior low-level concentrations. Samples for TO-15 analysis collected in September 2020 show total CVOCs have reduced below the May 2020 rebound samples at the system influent and SVE-3. Additional modifications to increase flushing between extraction wells SVE-2 and SVE-3, based on the elevated PCE detections observed during the soil confirmation sampling event in the second quarter of 2018, may be considered.

Groundwater monitoring will continue in accordance with the EDR and approved updates to the Compliance Monitoring Plan (CMP), with supplemental VOC and TOC sampling at selected wells.

Substrate injections for ERD treatment were completed at SWMU-172/174, Building 4-78/79, AOC-60, AOC-90, Apron A, and AOC-003 in this third quarter of 2020 following the site-wide groundwater sampling. In addition, an eighth round of nitrate/sulfate injections for benzene treatment at the Building 4-78/79 area was completed in August 2020 with collection of performance monitoring data in September 2020. Additional substrate and/or nitrate/sulfate injections will be recommended following the review of the fourth quarter 2020 monitoring results.

5.0 References

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CALIBRE 2018a. Recommendation to shut down SVE system at Building 4-78/4-79 SWMU/AOC Group; Boeing Renton Site. Prepared by CALIBRE Systems, Inc. for The Boeing Company, EHS Remediation. October 2018.

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Ecology 2015. Washington State Water Quality Standards: Human Health Criteria and Implementation Tools. Prepared by the Washington Department of Ecology. Publication no. 14-10-058. January 2015.

USACE 2002. Engineering and Design - Soil Vapor Extraction and Bioventing. Prepared by US Army Corps of Engineers. EM 1110-1-4001. June 2002.

Wood 2019. Quarterly report, third quarter 2019. RCRA Corrective Action Program Boeing Renton Facility. Prepared by Wood and CALIBRE Systems, Inc. for the Boeing Company, EHS Remediation. November 2019.

TABLES

Table 2-1 TO-15 Analytical Results - SWMU-172/174 SVE System Project History

SVE System Inlet

Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	1,1-DCA	Acetone	Toluene	m,p-Xylene	Chloroform	o-Xylene	Pentane	Hexane	Total Chlorinated	Total VOCs
4/17/2015	1,500	130	120	ND	ND	13	ND	ND	ND	ND	ND	ND	ND	ND	1,763	1,763
10/13/2015	400	31	13	ND	ND	3.3	ND	ND	ND	ND	ND	ND	ND	ND	447	447
3/8/2016	82	5.4	3.1	ND	ND	ND	ND	ND	1.1	2.2	ND	ND	ND	ND	91	94
6/30/2016	230	18	10	ND	ND	1.8	ND	11	ND	ND	2.4	ND	ND	ND	260	273
9/12/2016	230	16	8.3	ND	ND	1.9	ND	ND	ND	ND	1.2	ND	ND	ND	256	257
12/14/2016	100	6.2	3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110	110
5/30/2017 - 30 min	520	220	17	ND	ND	13	2.7	ND	ND	ND	ND	ND	ND	ND	773	773
5/30/2017 - 100 min	530	200	17	ND	ND	14	ND	ND	ND	ND	ND	ND	ND	ND	761	761
5/30/2017 - 225 min	510	130	16	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	668	668
8/16/2017	180	16	7.8	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	206	206
12/8/2017 - Rebound Start	99	7.6	3.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	110	110
5/22/2018	430	43	13	ND	ND	12	ND	ND	ND	ND	ND	ND	ND	ND	498	498
6/7/2018	160	13	5.4	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	180	180
6/20/2018	170	14	5.7	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	192	192
8/30/2018	110	8.6	3.7	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	122	122
2/13/2019	32	2.2	1.6	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	36	36
6/20/2019	74	6.2	3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	84	84
5/19/20 - Rebound Start	150	17	5.7	ND	ND	4	ND	ND	ND	ND	ND	ND	ND	ND	177	177
5/21/20 - Rebound 48 Hrs	120	230	5	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	358	358
9/23/2020	110	11	3.7	ND	ND	1.8	ND	ND	ND	ND	ND	ND	ND	ND	127	127

SVE-1

Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	1,1-DCA	Acetone	Toluene	m,p-Xylene	Chloroform	o-Xylene	Pentane	Hexane	Total Chlorinated	Total VOCs
6/20/2019	10	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11	11

SVE-2

Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	1,1-DCA	Acetone	Toluene	m,p-Xylene	Chloroform	o-Xylene	Pentane	Hexane	Total Chlorinated	Total VOCs
8/30/2018	180	14	6.1	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	200
2/13/2019	48	3.3	2.8	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	54	54
6/20/2019	100	9.6	5.1	ND	ND	1.4	ND	ND	1.4	ND	ND	ND	ND	ND	116	118
5/19/20 - Rebound Start	28	3.8	1.4	ND	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	35	35
5/21/20 - Rebound 48 Hrs	20	3.4	2.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	26	26
9/23/2020	42	6.7	5.6	ND	ND	ND	ND	ND	ND	ND	1.9	ND	ND	ND	54	56

Table 2-1 TO-15 Analytical Results - SWMU-172/174 SVE System Project History

SVE-3

Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	1,1-DCA	Acetone	Toluene	m,p-Xylene	Chloroform	o-Xylene	Pentane	Hexane	Total Chlorinated	Total VOCs
5/30/2017 - 30 min	540	51	18	ND	ND	14	2.6	ND	2.2	ND	ND	ND	ND	ND	626	628
5/30/2017 - 100 min	200	16	6.5	ND	ND	5.5	ND	ND	ND	ND	ND	ND	ND	ND	228	228
8/16/2017	350	30	15	ND	ND	3.5	ND	ND	ND	ND	1.3	ND	ND	ND	399	400
12/8/2017 - Rebound Start	170	13	5.8	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	191	191
1/19/2018 - 35-Day 60 Minute Sample	310	30	13	ND	ND	6.9	1.3	ND	ND	ND	1.1	ND	ND	ND	361	362
1/19/2018 - 35-Day 180 Minute Sample	310	28	12	ND	ND	7.9	1.1	ND	ND	ND	1.1	ND	ND	ND	359	360
3/6/2018 - 80-Day 60 Min Sample	440	41	15	ND	ND	14	2.2	ND	ND	ND	ND	ND	ND	ND	512	512
3/6/2018 - 80-Day 180 Min Sample	410	33	13	ND	ND	13	1.6	ND	ND	ND	ND	ND	ND	ND	471	471
5/22/2018	790	66	22	ND	ND	22	ND	ND	ND	ND	ND	ND	ND	ND	900	900
6/7/2018	280	23	9.6	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	ND	316	316
6/20/2018	310	24	11	ND	ND	3.4	ND	ND	ND	ND	ND	ND	ND	ND	348	348
5/19/20 - Rebound Start	350	49	14	ND	ND	10	2.0	ND	ND	ND	ND	ND	ND	ND	425	425
5/21/20 - Rebound 48 Hrs	290	240	9.8	ND	ND	5.9	ND	ND	ND	ND	ND	ND	ND	ND	546	546
9/23/2020	410	37	11	ND	ND	6.0	ND	ND	3.8	ND	ND	ND	ND	ND	464	468

VPC Outlet

Date	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1,1-TCA	1,1-DCA	Acetone	Toluene	m,p-Xylene	Chloroform	o-Xylene	Pentane	Hexane	Total Chlorinated	Total VOCs
4/17/2015	5.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.1	5.1
10/13/2015	ND	ND	ND	ND	ND	ND	ND	11	ND	ND	ND	ND	ND	ND	ND	11
3/8/2016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
6/30/2016	ND	ND	ND	ND	ND	ND	ND	ND	15	1.6	ND	1.2	6.2	1.2	ND	25
9/12/2016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
12/14/2016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
8/16/2017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

All results are in parts per billion by volume (ppbv).

ND = non-detect

NA = not analyzed

DCE = Dichloroethene

PCE = tetrachloroethene

TCE = trichloroethene

Total Chlorinated = the sum of PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, 1,1,1-TCA, and 1,1-DCA.

Shaded cells are results from 3rd Quarter 2020.

Table 2-2 PID Monitoring - SWMU-172/174 SVE System

Date	Days in Operation Since Startup [1]	SVE-01	SVE-02	SVE-03	VPC Inlet	VPC Mid	VPC Outlet	Notes
7/2/2020	1,673	Vent	742	2,414	1,720		0	Changed blower oil
7/9/2020	1,680	Vent	964	1,860	1,682			Background PID @ 550 ppb
7/16/2020	1,687	Vent	486	992	566			
7/30/2020	1,701	Vent	661	4,928	1,170			SVE system was off at arrival, most likely due to high heat.
8/6/2020	1,708	Vent	9,925	15,000	14,300			
8/14/2020	1,716	Vent	2,160	9,057	5,848		0	
8/20/2020	1,722	Vent	1,567	1,502	2,057			
8/26/2020	1,728	Vent	851	14,380	6,651		0	
9/2/2020	1,735	Vent	71	1,752	1,106		0	
9/23/2020	1,756	Vent	380	1,312	583			System off at arrival, restarted system, collected GW samples at 4-78/79, then came back to screen system and collect TO-15 samples.

Notes:

[1] Days in operation since system startup on April 17, 2015.

Operational change was made on 6/20/19. Due to reduced concentrations observed at SVE-1 and the influent, SVE-01 was opened as a vent well to promote focused flow towards SVE-02 and SVE-03.

Blank cells - Not all wells were measured with the PID during each sampling event.

Table 2-3 VOC Mass Removal Estimate - SWMU 172/174 SVE System

Date	Average TO-15 Total CVOCs September 2020 (ppbv)[1]	System Flow (cfm)	Cumulative Runtime Hours	VOCs removed in Operating Period Between Monitoring Events (lbs)	Cumulative VOC Mass Removed Since Start of SVE Operations in April, 2015 (lbs)
7/2/2020	127	100	32,335	0.155	20.45
7/9/2020	127	105	32,509	0.057	20.51
7/16/2020	127	105	32,669	0.052	20.56
7/30/2020	127	105	32,743	0.024	20.59
8/6/2020	127	100	32,913	0.053	20.64
8/14/2020	127	100	33,102	0.058	20.70
8/20/2020	127	100	33,248	0.045	20.74
8/26/2020	127	100	33,388	0.043	20.78
9/2/2020	127	100	33,557	0.052	20.84
9/23/2020	127	90	33,989	0.120	20.96

Notes:

PID = photoionization detector

ppbv = parts per billion by volume

cfm = cubic feet per minute

lbs = pounds

[1] VOC mass calculated in 3rd Quarter 2020 is based on the average of the total VOCs detected in the September 2020 TO-15 samples from the system influent. The paired PID readings are significantly higher than the laboratory results and if used, would overestimate the mass removal.

Table 3-1 - August 2020 Injection Summary at Renton AOCs

Area	Injection Well	Volume of Solution - ERD (gallons)	Brix (°Bx)	Pounds Substrate in the Solution (lbs)
SWMU-172/174	B172-01	500	8.5	354
	B172-02	485	8.5	344
	B172-03	470	8.5	333
	B172-04	510	9.7	404
	B172-05	510	9.7	403
	B172-06	510	9.7	410
	B172-07	500	9.6	388
	B172-08	511	9.7	421
	B172-09	500	9.6	391
	B172-10	500	9.6	383
	B172-11	500	9.6	389
	B172-12	507	9.6	389
	B172-13	470	8.5	333
	B172-14	490	9.7	387
Building 4-78/79	B78-12	512	7.4	318
	B78-14	507	7.4	314
	B78-15	523	7.4	324
	B78-16	520	7.4	323
AOC-060	GW012S	743	8.2	508
	GW147S	742	8.2	507
AOC-090	IPR3	489	12.0	489
	IPR4	483	12.0	483
	GW 189S	517	12.0	517
Apron A	GW 263S	750	9.1	569
	GW 264S	Would not accept substrate		
	GW 265S	750	9.1	569
AOC-003	B003-01	553	8.5	392
	B003-02	496	8.5	352
	B003-03	479	8.5	340
	B003-04	511	8.5	362
	Total (gal)	15,538	Total (lbs)	11,699

Notes:

°Bx (degrees brix) is a measure of the sugar content in an aqueous solution. One degree Brix is 1 gram of sucrose in 100 grams of solution and represents the strength of the solution as percantage by mass

Table 3-2 - August 2020 Injection Volumes at 4-78/79 Benzene Treatment Wells

Area	Injection Well	Volume Total (gal)	NaNO3 (lbs)	MgSO4 (lbs)	DAP (lbs)	Concentration NO3 Injected (mg/L)	Concentration SO4 Injected (mg/L)
Building 4-78/79	B78-11	500	9.12	4.18	5.36	1,599	803
	B78-13	479	9.12	4.18	5.36	1,669	838
	B78-17	486	9.12	4.18	5.36	1,645	826
	B78-18	500	9.12	4.18	5.36	1,599	803
	B78-19	500	9.12	4.18	5.36	1,599	803
	B78-20	527	9.12	4.18	5.36	1,517	762
	B78-21	500	9.12	4.18	5.36	1,599	803

Notes:
NaNO3 - Sodium Nitrate
MgSO4 - Magnesium Sulfate
DAP - Diammonium Phosphate

Table 3-3 - Baseline and Performance Monitoring Groundwater Data; 4-78/79 Benzene Treatment Area

Sample ID	Date	Sample Depth (ft bgs)	TCE (ug/L)		cis-1,2-DCE (ug/L)		VC (ug/L)		Benzene (ug/L)		Nitrate (mg-N/L)		Nitrite (mg-N/L)		Sulfate (mg/L)	
B78-11-8-113017	11/30/2017	8	0.42		0.98		1.11		9.66		<0.100	U	<0.100	U	1.94	
B78-11-021418	2/14/2018	8	1.16		0.84		1.09		14.8		<0.100	U	<0.100	U	9.22	D
B78-11-051518	5/15/2018	8	1.86		0.78		1.06		12.6		<0.100	U	<0.100	U	34.1	D
B78-11-180917	9/17/2018	8	5.01		7.90		3.62		9.20		<0.100	U	<0.100	U	23.4	D
B78-11-020719	2/7/2019	8	3.13		2.47		1.81		4.88		<0.100	U	<0.100	U	25.0	D
B78-11-050719	5/7/2019	8	8.60		6.55		3.56		2.15		<0.100	U	<0.100	U	47.0	D
B78-11-112019	11/20/2019	8	4.56		4.75		3.06		0.97		<0.100	U	<0.100	U	5.65	D
B78-11-021120	2/11/2020	8	7.21		6.00		3.10		1.20		<0.100	U	<0.100	U	118	D
B78-11-092320	**9/23/2020**	**8**	**<0.2**	**U**	**3.14**		**3.52**		**2.64**		**0.205**		**<0.100**	**U**	**2.38**	
B78-13-15-112917	11/29/2017	15	0.24		1.29		2.02		9.92		0.135		<0.100	U	0.652	
B78-13-021418	2/14/2018	15	<0.2	U	1.78		8.49		4.11		<0.100	U	<0.100	U	1.31	
B78-13-051518	5/15/2018	15	<0.2	U	0.85		0.87		4.94		0.182		<0.100	U	4.32	D
B78-13-180917	9/17/2018	15	<0.2	U	0.61		0.38		3.29		<0.100	U	<0.100	U	0.812	
B78-13-020719	2/7/2019	15	<0.2	U	0.37		0.29		0.74		<0.100	U	<0.100	U	0.189	
B78-13-050719	5/7/2019	15	<0.2	U	0.57		0.45		1.16		<0.100	U	<0.100	U	<0.100	U
B78-13-112019	11/20/2019	15	<0.2	U	0.40		0.30	M	1.81		<0.100	U	<0.100	U	0.354	
B78-13-021120	2/11/2020	15	<0.2	U	0.37		0.43		1.42		<0.100	U	<0.100	U	2.87	D
B78-13-092320	**9/23/2020**	**15**	**<0.2**	**U**	**0.44**		**0.41**		**1.00**		**0.396**		**<0.100**	**U**	**13.9**	**D**
B78-17-9-100617	10/6/2017	9	<0.2	U	0.17	J	0.33		4.84		-		-		-	
B78-17-15-112917	11/29/2017	15	1.25		0.81		1.31		6.52		<0.100	U	<0.100	U	17.1	D
B78-17-021418	2/14/2018	15	2.57		1.78		1.47		4.61		<0.100	U	<0.100	U	7.35	D
B78-17-051518	5/15/2018	15	0.91		1.63		0.53		2.60		<0.100	U	<0.100	U	8.66	D
B78-17-180917	9/17/2018	15	<0.2	U	0.39		<0.2	U	1.37		<0.100	U	<0.100	U	9.63	D
B78-17-020719	2/7/2019	15	<0.2	U	0.68		0.47		0.56		0.101		<0.100	U	2.32	
B78-17-050719	5/7/2019	15	5.00		5.72		1.79		1.07		0.101		<0.100	U	4.92	D
B78-17-112019	11/20/2019	15	<0.2	U	0.69		0.26	M	0.28		<0.100	U	<0.100	U	1.32	
B78-17-021120	2/11/2020	15	7.03		4.33		3.34		0.61		<0.100	U	<0.100	U	17.5	D
B78-17-092320	**9/23/2020**	**15**	**0.65**		**0.86**		**0.37**		**0.40**		**1.63**		**<0.100**	**U**	**44.9**	**D**
B78-18-8-100617	10/6/2017	8	<0.2	U	0.07	J	0.29		0.72		-		-		-	
B78-18-15-112917	11/29/2017	15	<0.2	U	<0.2	U	0.35	M	3.10		<0.100	U	<0.100	U	0.343	
DUP-01-112917	11/29/2017	15	<0.2	U	<0.2	U	0.36		2.96		<0.100	U	<0.100	U	1.68	
B78-18-021418	2/14/2018	15	<0.2	U	<0.2	U	0.24		1.28		<0.100	U	<0.100	U	1.47	
B78-18-051518	5/15/2018	15	<0.2	U	<0.2	U	0.23		1.68		<0.100	U	<0.100	U	27.6	D
B78-18-180917	9/17/2018	15	<0.2	U	<0.2	U	<0.2	U	0.89		<0.100	U	<0.100	U	7.28	D
B78-18-020719	2/7/2019	15	<0.2	U	<0.2	U	0.22		1.32		<0.100	U	<0.100	U	2.41	D
B78-18-050719	5/7/2019	15	<0.2	U	0.31		0.24		1.66		<0.100	U	<0.100	U	2.44	D
B78-18-112019	11/20/2019	15	<0.2	U	<0.2	U	0.21	M	1.18		<0.100	U	<0.100	U	2.64	D
B78-18-021120	2/11/2020	15	0.38		0.43		0.56		1.20		<0.100	U	<0.100	U	23.7	D
B78-18-092320	**9/23/2020**	**15**	**<0.2**	**U**	**0.27**		**<0.2**	**U**	**1.05**		**<0.100**	**U**	**<0.100**	**U**	**70.2**	**D**
B78-19-9-100617	10/6/2017	9	<0.2	U	0.06	J	0.22		0.69		-		-		-	
B78-19-15-112917	11/29/2017	15	<0.2	U	<0.2	U	0.27	M	0.36		<0.100	U	<0.100	U	0.255	
B78-19-021418	2/14/2018	15	<0.2	U	<0.2	U	0.21		0.23		<0.100	U	<0.100	U	1.22	
B78-19-051518	5/15/2018	15	<0.2	U	<0.2	U	0.21		0.34		<0.100	U	<0.100	U	22.4	D
B78-19-180917	9/17/2018	15	<0.2	U	<0.2	U	<0.2	U	<0.2	U	<0.100	U	<0.100	U	1.91	
B78-19-020719	2/7/2019	15	<0.2	U	<0.2	U	<0.2	U	<0.2	U	<0.100	U	<0.100	U	2.16	
B78-19-050719	5/7/2019	15	<0.2	U	<0.2	U	<0.2	U	0.50		<0.100	U	<0.100	U	14.2	D
B78-19-112019	11/20/2019	15	<0.2	U	<0.2	U	0.2	M	0.21		<0.100	U	<0.100	U	0.454	
B78-19-021120	2/11/2020	15	<0.2	U	<0.2	U	<0.2	U	0.26		0.395		<0.100	U	28.3	D
B78-19-092320	**9/23/2020**	**15**	**<0.2**	**U**	**<0.2**	**U**	**<0.2**	**U**	**<0.2**	**U**	**<0.100**	**U**	**0.11**		**1.97**	
B78-20-8-100617	10/6/2017	8	<0.2	U	<0.2	U	0.14	J	8.81		-		-		-	
B78-20-15-113017	11/30/2017	15	0.41		<0.2	U	<0.2	U	25.9		2.93	D	<0.100	U	53.9	D
B78-20-021418	2/14/2018	15	0.25		0.49	M	<0.2	U	40.0		<0.100	U	<0.100	U	21.1	D
B78-20-051518	5/15/2018	15	<0.2	U	0.39		0.22		54.2		<0.100	U	<0.100	U	15.5	D
B78-20-180917	9/17/2018	15	0.24		0.27		0.29		0.98		<0.100	U	<0.100	U	2.39	
B78-20-020719	2/7/2019	15	<0.2	U	0.41	M	0.25		16.5		<0.100	U	<0.100	U	1.89	
B78-20-050719	5/7/2019	15	<0.2	U	0.32		0.28		16.3		<0.100	U	<0.100	U	4.93	D
B78-20-112019	11/20/2019	15	<0.2	U	0.25		0.31	M	5.04		0.129		<0.100	U	2.47	

Table 3-3 - Baseline and Performance Monitoring Groundwater Data; 4-78/79 Benzene Treatment Area

Sample ID	Date	Sample Depth (ft bgs)	TCE (ug/L)		cis-1,2-DCE (ug/L)		VC (ug/L)		Benzene (ug/L)		Nitrate (mg-N/L)		Nitrite (mg-N/L)		Sulfate (mg/L)	
B78-20-021120	2/11/2020	15	<0.2	U	0.29		<0.2	U	6.62		<0.100	U	<0.100	U	11.1	D
B78-20-092320	**9/23/2020**	**15**	**<0.2**	**U**	**0.37**		**<0.2**	**U**	**9.07**		**<0.100**	**U**	**<0.100**	**U**	**40.3**	**D**
B78-21-8-100617	10/6/2017	8	<0.2	U	0.13	J	0.21		1.42		-		-		-	
Dup01-100617	10/6/2017	15	<0.2	U	0.15	J	0.20	J	2.01		-		-		-	
B78-21-15-112917	11/29/2017	15	<0.2	U	0.31	M	0.26		2.27		0.101		<0.100	U	4.43	D
B78-21-021418	2/14/2018	15	<0.2	U	0.24		0.30		0.86		<0.100	U	<0.100	U	1.60	
B78-21-051518	5/15/2018	15	<0.2	U	0.27		0.27		1.08		<0.100	U	<0.100	U	4.59	D
B78-21-180917	9/17/2018	15	0.22		0.29		<0.2	U	0.59		<0.100	U	<0.100	U	3.62	D
B78-21-020719	2/7/2019	15	<0.2	U	0.28		0.32		0.43		0.170		0.161		3.78	D
B78-21-050719	5/7/2019	15	<0.2	U	0.42		<0.2	U	0.80		<0.100	U	<0.100	U	5.73	D
B78-21-112019	11/20/2019	15	<0.2	U	0.30		<0.2	U	<0.2	U	<0.100	U	<0.100	U	5.92	D
B78-21-021120	2/11/2020	15	<0.2	U	0.30		0.31		<0.2	U	<0.100	U	<0.100	U	20.4	D
B78-21-092320	**9/23/2020**	**15**	**<0.2**	**U**	**0.32**		**0.25**		**0.39**		**<0.100**	**U**	**<0.100**	**U**	**26.3**	**D**
GW-244S-13-112917	11/29/2017	13	3.48		8.06		5.68		7.97		<0.100	U	<0.100	U	0.753	
GW-244S-021418	2/14/2018	13	1.01		1.25		1.22		5.34		<0.100	U	<0.100	U	1.25	
GW-244S	3/6/2018	13	1.26		2.00		1.56		6.86		-		-		-	
GW-244S-051518	5/15/2018	13	<0.2	U	0.30		0.41		3.89		<0.100	U	<0.100	U	<0.100	U
GW-244S-180917	9/17/2018	13	<0.2	U	0.25		0.38		3.74		<0.100	U	<0.100	U	0.113	
GW-244S	*11/13/2018*	*13*	*<0.2*	*U*	*0.26*		*0.55*		*2.95*		-		-		-	
GW-244S-020719	2/7/2019	13	<0.2	U	0.26		0.47		1.14		0.101		<0.100	U	0.337	
GW-244S	*3/4/2019*	*13*	*0.22*		*0.82*		*0.86*		*1.73*		-		-		-	
GW-244S-050719	5/7/2019	13	<0.2	U	1.22		1.18		1.13		<0.100	U	<0.100	U	1.45	
GW-244S	*5/7/2019*	*13*	*<0.2*	*U*	*2.03*		*1.45*		*1.47*		-		-		-	
GW-244S	*8/13/2019*	*13*	*<0.2*	*U*	*0.37*		*0.71*		*1.77*		-		-		-	
GW-244S	*11/11/2019*	*13*	*<0.2*	*U*	*<0.2*	*U*	*0.35*		*0.87*		-		-		-	
GW-244S-112019	11/20/2019	13	<0.2	U	<0.2	U	0.50	M	0.41		<0.100	U	<0.100	U	0.160	
GW-244S-021120	2/11/2020	13	0.22		0.56		0.67		0.25		0.145		<0.100	U	2.69	D
GW-244S	*3/10/2020*	*13*	*0.23*		*0.68*		*0.70*		*0.52*		-		-		-	
GW-244S-092320	**9/23/2020**	**13**	**<0.2**	**U**	**0.26**		**0.39**		**0.20**		**<0.100**	**U**	**<0.100**	**U**	**3.96**	
GW-031S-23-113017	11/30/2017	23	<0.2	U	<0.2	U	<0.2	U	17.6		<0.100	U	<0.100	U	2.54	D
GW-031S-021418	2/14/2018	23	<0.2	U	0.45	M	0.49		21.9		<0.100	U	<0.100	U	3.67	D
DUP-01-021418	2/14/2018	23	<0.2	U	0.46		0.42		21.4		-		-		-	
GW-031S	3/6/2018	23	<0.2	U	1.18		<0.2	U	60.3		-		-		-	
GW-031S-051518	5/15/2018	23	0.36		0.40		0.21		2.68		<0.100	U	<0.100	U	2.95	D
Dup-01-051518	5/15/2018	23	0.32		0.34		0.20		2.64		<0.100	U	<0.100	U	2.87	D
GW-031S-180917	9/17/2018	23	<0.2	U	<0.2	U	0.28		<0.2	U	<0.100	U	<0.100	U	0.499	
Dup-01-180917	9/17/2018	23	<0.2	U	0.21		0.30		<0.2	U	<0.100	U	<0.100	U	0.441	
GW-031S	*11/13/2018*	*23*	*<0.2*	*U*	*0.63*		*0.31*		*28.3*		-		-		-	
Dup-01	*11/13/2018*	*23*	*<0.2*	*U*	*0.58*		*0.30*		*23.8*		-		-		-	
GW-031S-020719	2/7/2019	23	<0.2	U	0.51	M	<0.2	U	21.6		<0.100	U	<0.100	U	0.170	
Dup-01-020719	2/7/2019	23	<0.2	U	0.57	M	0.24		22.7		<0.100	U	<0.100	U	0.202	
GW-031S	*3/4/2019*	*23*	*<0.2*	*U*	*<0.2*	*U*	*<0.2*	*U*	*55.9*		-		-		-	
Dup-01	*3/4/2019*	*23*	*<0.2*	*U*	*<0.2*	*U*	*<0.2*	*U*	*58.6*		-		-		-	
GW-031S-050719	5/7/2019	23	<0.2	U	0.22		0.30		1.90		<0.100	U	<0.100	U	1.86	
Dup-01-050719	5/7/2019	23	<0.2	U	0.27		<0.2	U	2.16		<0.100	U	<0.100	U	0.689	
GW-031S	*5/7/2019*	*23*	*<0.2*	*U*	*0.43*		*0.29*		*7.13*		-		-		-	
Dup-01	*5/7/2019*	*23*	*<0.2*	*U*	*0.38*		*0.27*		*6.69*		-		-		-	
GW-031S	*8/13/2019*	*23*	*<0.2*	*U*	*0.47*		*0.21*		*3.47*		-		-		-	
Dup-01	*8/13/2019*	*23*	*<0.2*	*U*	*0.48*		*0.22*		*4.37*		-		-		-	
GW-031S	*11/11/2019*	*23*	*<0.2*	*U*	*0.40*		*0.25*		*4.77*		-		-		-	
Dup-01	*11/11/2019*	*23*	*<0.2*	*U*	*0.39*		*0.27*		*4.75*		-		-		-	
GW-031S-112019	11/20/2019	23	<0.2	U	<0.2	U	<0.2	U	1.90		<0.100	U	<0.100	U	1.26	
Dup-01-112019	11/20/2019	23	<0.2	U	<0.2	U	0.27	M	2.31		<0.100	U	<0.100	U	1.16	
GW-031S-021120	2/11/2020	23	<0.2	U	<0.2	U	0.25		3.47		<0.100	U	<0.100	U	3.29	D
Dup-01-021120	2/11/2020	23	<0.2	U	<0.2	U	0.27		3.69		<0.100	U	<0.100	U	3.11	D
GW-031S	*3/10/2020*	*23*	*<0.2*	*U*	*0.61*		*<0.2*	*U*	*37.1*		-		-		-	
Dup-01	*3/10/2020*	*23*	*<0.2*	*U*	*0.56*		*<0.2*	*U*	*38.5*		-		-		-	
GW-031S-092320	**9/23/2020**	**23**	**<0.2**	**U**	**0.21**		**0.26**		**0.45**		**<0.100**	**U**	**<0.100**	**U**	**2.39**	
Dup-01-092320	**9/23/2020**	**23**	**<0.2**	**U**	**0.22**		**<0.2**	**U**	**0.45**		**<0.100**	**U**	**<0.100**	**U**	**2.52**	

Table 3-3 - Baseline and Performance Monitoring Groundwater Data; 4-78/79 Benzene Treatment Area

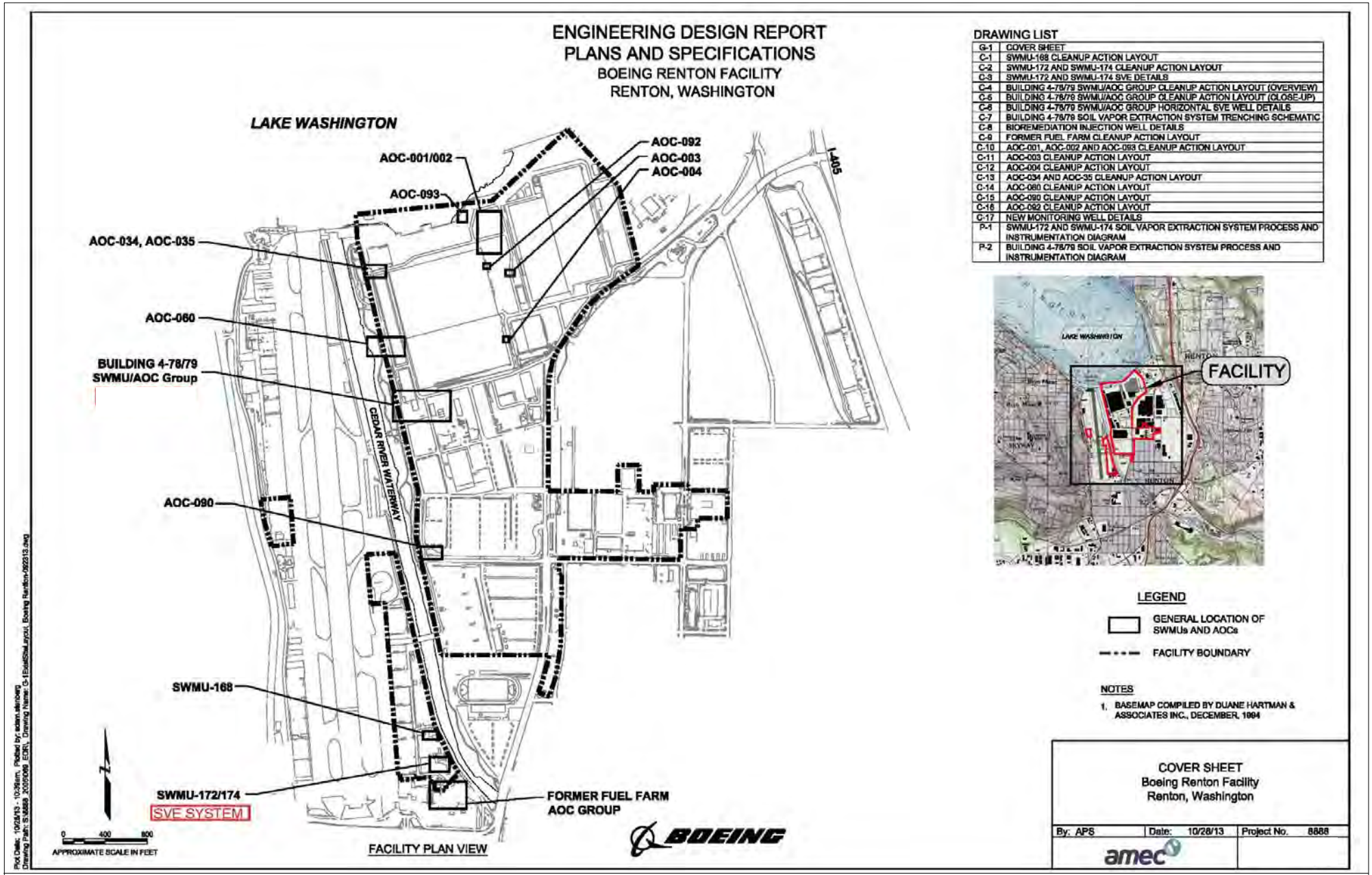
Sample ID	Date	Sample Depth (ft bgs)	TCE (ug/L)	cis-1,2-DCE (ug/L)	VC (ug/L)	Benzene (ug/L)	Nitrate (mg-N/L)	Nitrite (mg-N/L)	Sulfate (mg/L)

Notes:
U = non-detect
D = dilution
M = Estimated value for a GC/MS analyte detected and confirmed by an analyst but with low spectral match parameters.
Samples in italics collected as part of the Renton quarterly groundwater monitoring program.

Table 3-4 Groundwater Monitoring Results Summary August 2020 and Recommended ERD Treatment

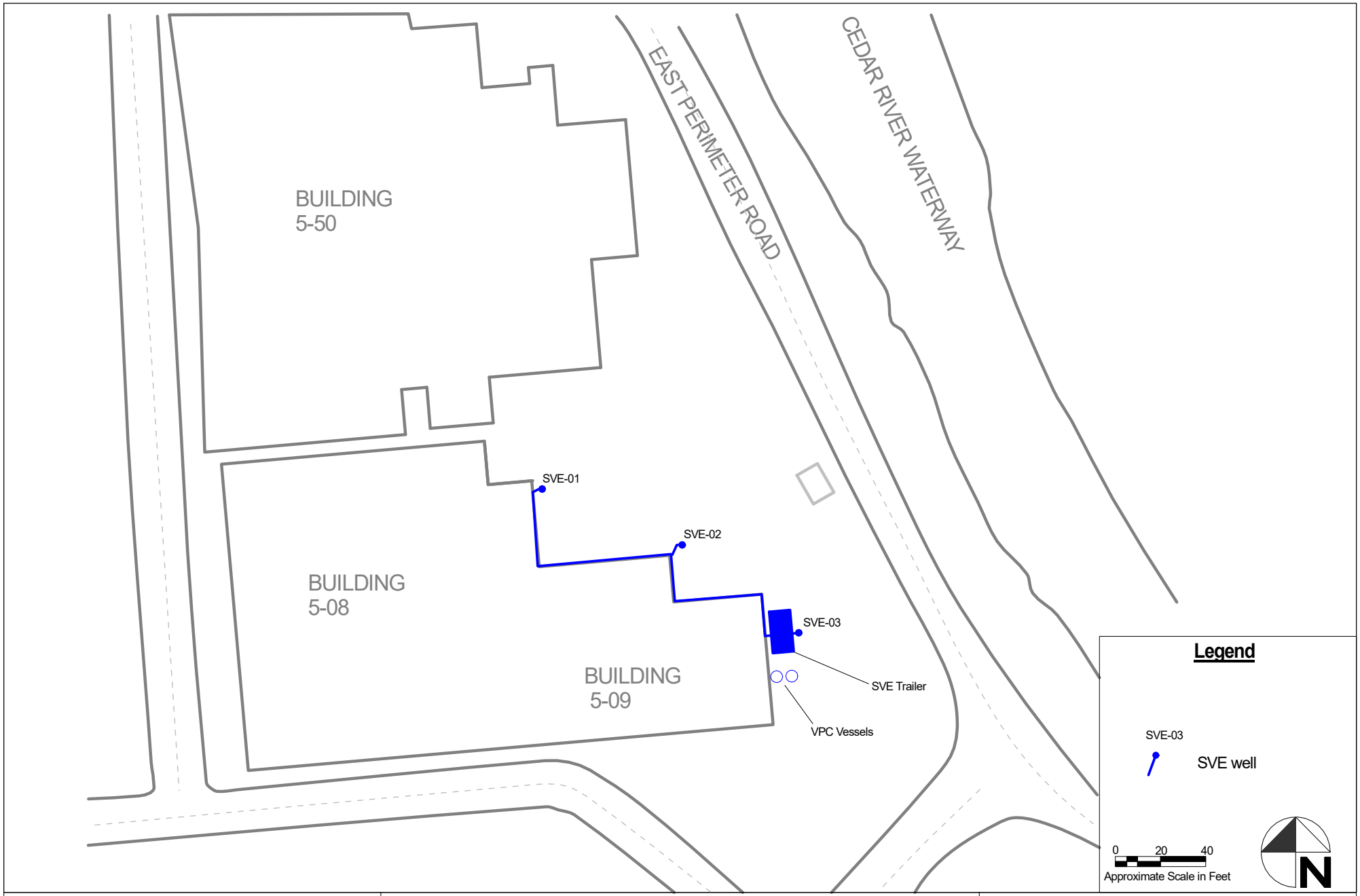
GW Treatment Area	Source and down gradient MWs	CPOC wells	Treatment IWs	ERD Treatment Recommendation
SWMU-172/174	PCE at or less than 0.32 ug/L; TCE less than 0.60 ug/L; cisDCE less than 1.75 ug/L and VC less than 0.30 ug/L.	All detections are at or below 0.50 ug/L	*Prior data Mar 2018, North and South IWS showed total CVOCs range from 0.03 ug/L to 6.90 ug/L. TOC near background.*	**Additional injections completed after August 2020 monitoring. Will consider additional injections if beneficial after review of future sampling results.**
Building 4-78/4-79 SWMU/AOC Group	TCE is nondetect, cisDCE is less than 1.12 ug/L and VC is less than 1.0 ug/L at all but GW033S with cisDCE at 188 ug/L and VC at 310 ug/L. One central well (GW033S) continues to show total CVOCs remain reduced from Nov 2017 results of 1,430 ug/L but have increased from prior quarter. Recent data show 73.4 ug/L in Mar 2020 and 127 ug/L in May 2020. Substrate was applied to this area after Aug 2020 sampling. Benzene decreased at source well GW031S (17.6 ug/L in May 2020 to 2.1 ug/L in Aug 2020). Nitrate/sulfate injections completed in Aug 2020.	Majority of detections are ND; Northern well GW237S showed benzene decrease from 1.03 ug/L in May 2020 to 0.24 ug/L in Aug 2020.	*Prior data May 2017, 4 of 5 wells with low detections where sum of CVOCs are less than 3 ug/L*	**Additional injections completed after August 2020 monitoring. Will consider additional injections if beneficial after review of future sampling results.**
AOC-001/002	*Prior data Mar 2020: Source MW: TCE is 0.03 ug/L, cisDCE is 0.49 ug/L and VC is 0.27 ug/L.*	*Prior data Aug 2019: All detections below 0.30 ug/L.*	*Prior data Mar 2018, detections at or below 0.30 ug/L.*	**Detections are very low throughout the site. Will consider additional injections if beneficial. Site still not accessible due to construction**
AOC-003	VC less than 0.30 ug/L.	VC less than 0.40 ug/L.	*Prior data May 2017 one of four IWs sampled – VC detection less than 0.30 ug/L*	**Additional injections completed after August 2020 monitoring. Will consider additional injections if beneficial after review of suture sampling results.**
Lot 20 / former 10-71	*Prior data May 2020 - All wells are ND.*	-	-	**No action at this time.**
AOC-60	Treatment MWs with total CVOCs less than 4.5 ug/L, other MWs with total CVOCs less than 0.40 ug/L.	MW's with total CVOCs less than 0.21 ug/L.	-	**Additional injections completed after August 2020 monitoring. Will consider additional injections if beneficial after review of future sampling results.**
AOC – 90	Source with total CVOCs less than 2.7 ug/L; down gradient wells with VC at 0.23 ug/L.	VC detections less than 0.38 ug/L.	-	**Additional injections completed after August 2020 monitoring. Will consider additional injections if beneficial after review of future sampling results.**
Apron A	cisDCE at 0.52 ug/L and VC is nondetect.	-	-	**Additional injections completed after August 2020 monitoring. Will consider additional injections if beneficial after review of future sampling results.**
Building 4-70	-	*Prior data March 2020, total CVOCs less than 0.63 ug/L.*	-	**Detections are very low throughout the site. Will consider additional injections if beneficial.**

FIGURES



CALIBRE Systems, Inc.

Figure 1-1 Site Location/ AOC Outlines



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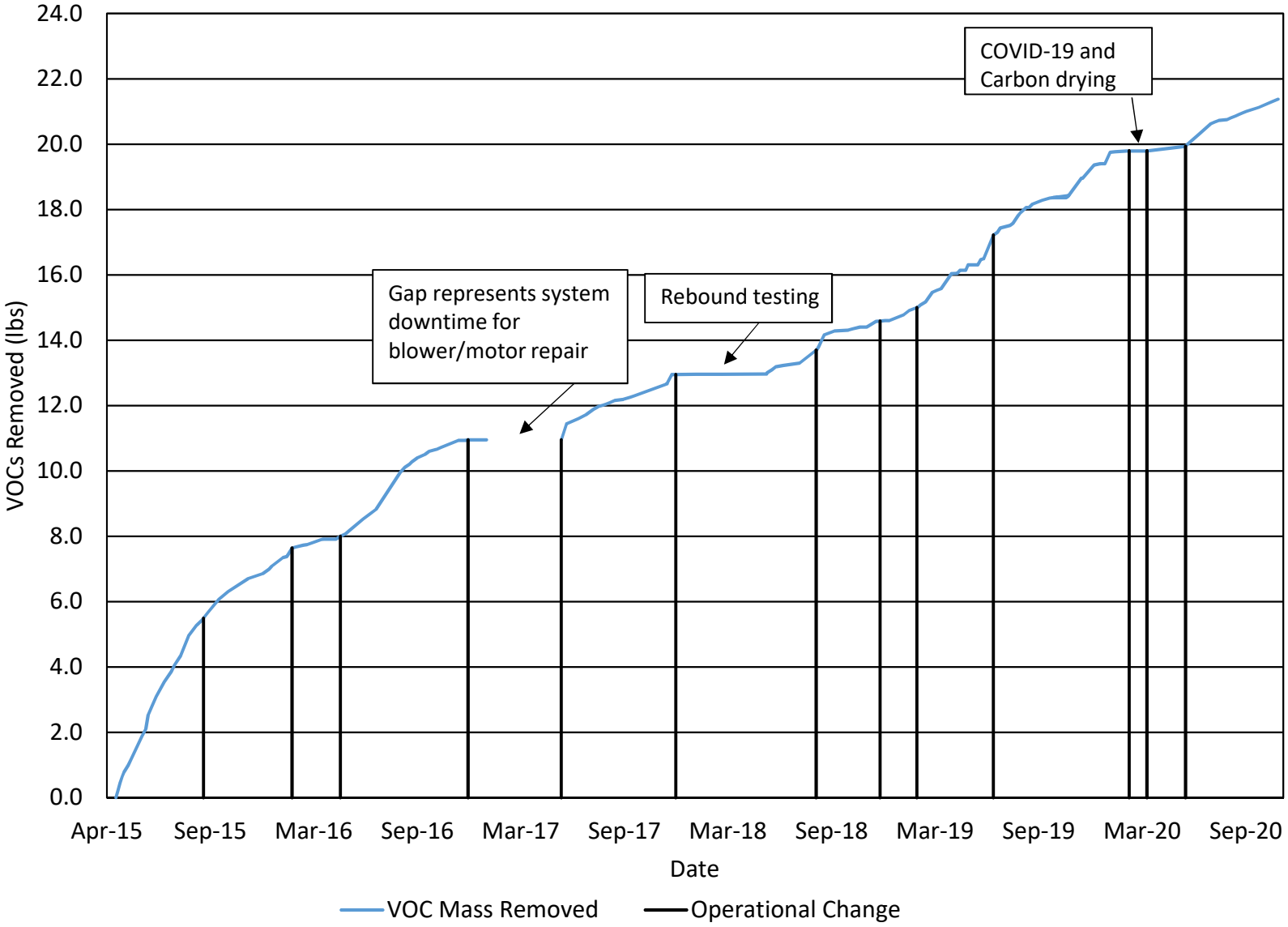
Boeing Renton
Spring 2017 SVE Quarterly Summary Report

Figure 2-1 SWMU-172/174 Area
SVE System Layout

Figure 2-2 Cumulative VOC Mass Removed - SWMU-172/174 SVE System



*SWMU 172/174 SVE system did not run Winter 2017 due to equipment failure.

Attachment A: Field Log Forms

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 7/2/20 Date of last inspection: 6/11/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.		
Inspection Time: 0830		Motor Hours: 1,867.5
Blower	**Current Value**	**Other Notes**
Vacuum gauge	65" H20	Changed Blower Oil.
Pressure gauge	10" H20	
System flow rate	100 SCFM	
Blower Temperature	123° F	
Temp.at lag VPC discharge		
Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration		

PID Model: PPB RAE 300			Details: 0.0 / 9,999 ppb				
Calibration time/ date: 7/2/20 0830			PID check after monitoring:				
Sampling Point	**Time**	**PID Reading (1)**	**PID Reading (2)**	**Vacuum**	**Flow Rate (gauge)**	**Differential Pressure**	**Flow Rate Calculated[1]**
SVE-01	Vent						
SVE-02		742 ppb	689 ppb				
SVE-03		2,320 ppb	2,414 ppb				
VPC Inlet		1,690 ppb	1,720 ppb				
VPC Midpoint							
VPC Outlet		0 ppb	0 ppb				
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature Justin Neste (Printed Name) _____ (Signature) 7/2/20 (Date)

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 7/9/20 Date of last inspection: 7/2/20

Periodic systems check:

1) Check flowrate, vacuum, pressure, moisture separator, water storage drums

2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.

Inspection Time: 1330 Motor Hours: 2041.9

Blower	Current Value
Vacuum gauge	25" H_2O
Pressure gauge	5" H_2O
System flow rate	105 SCFM
Blower Temperature	122°F
Temp.at lag VPC discharge	

Other Notes

Background PID @ 550 ppb

DTW @ 478/79

B78-17 = 4.15'

B78-20 = 4.88'

Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration

PID Model: PPBRAE 3000 Details: 0 / 10 PPM

Calibration time/ date: 7/9/20 1330 PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	VENT						
SVE-02		958 ppb	970 ppb				
SVE-03		2,018 ppb	1,702 ppb				
VPC Inlet		1,762 ppb	1,801 ppb				
VPC Midpoint							
VPC Outlet							
Other vapor point ____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606

At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature _____ Printed Name _____ Signature _____ Date

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 7/16/20 Date of last inspection: 7/9/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.

Inspection Time: 0500 Motor Hours: 2201.7

Blower	Current Value	Other Notes
Vacuum gauge	25" H20	Background PID 299 ppb
Pressure gauge	10" H20	
System flow rate	105 SCFM	
Blower Temperature	122°F	DTW @ 478/79
Temp.at lag VPC discharge		B78-17 = 4.20
		B78-20 = 4.45

Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration

PID Model: PPB RAE 3000 Details: 0 / 10 PPM

Calibration time/ date: 7/16/20 0500 PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		479 PPB	493 ppb				
SVE-03		904 ppb	1080 ppb				
VPC Inlet		547 ppb	584 ppb				
VPC Midpoint							
VPC Outlet							
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature _____ Printed Name _____ Signature _____ Date

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 7/30/20 Date of last inspection: 7/16/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.

Inspection Time: 0933 Motor Hours: 2275.2

Blower	Current Value	Other Notes
Vacuum gauge	22" H_2O	SVE off @ arrival
Pressure gauge	5" H_2O	
System flow rate	105 SCFM	
Blower Temperature	95°F	
Temp.at lag VPC discharge		DTW @ 478/79 B78-17 = 4.33' B78-20 = 4.70'

Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration

PID Model: PPB RAE 3000 Details: 0 / 9,997 ppb

Calibration time/ date: 7/30/20 PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		752 ppb	569 ppb				
SVE-03		4,461 ppb	3,395 ppb				
VPC Inlet		1,139 ppb	1,201 ppb				
VPC Midpoint							
VPC Outlet							
Other vapor point							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature _____ Printed Name _____ Signature _____ Date

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 8/6/20 Date of last inspection: 7/30/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.		
Inspection Time: 1140		Motor Hours: 2445.3
Blower	**Current Value**	**Other Notes**
Vacuum gauge	25" H_2O	
Pressure gauge	8" H_2O	
System flow rate	100 SCFM	
Blower Temperature	113°F	DTW @ 478/79 B78-17 = 4.62' B78-20 = 4.83'
Temp.at lag VPC discharge		
Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration		

PID Model: PPB RAE 3000	Details: 0 / 9996 PPB
Calibration time/ date: 8/6/20 1140	PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		9,900 PPB	9950 PPB				
SVE-03		15,500 PPB	14,500 PPB				
VPC Inlet		16,400 PPB	17,200 PPB				
VPC Midpoint							
VPC Outlet							
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature _____ Printed Name _____ Signature _____ Date

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 8/14/20 Date of last inspection: 8/6/20

Periodic systems check:

1) Check flowrate, vacuum, pressure, moisture separator, water storage drums

2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.		
Inspection Time: 0830		Motor Hours: 2634.0
Blower	**Current Value**	**Other Notes**
Vacuum gauge	30" H_2O	DTW@ 478/74 ~ 24 HRS after injection @ site B78-17 = 4.67' B78-20 = 4.93'
Pressure gauge	2" H_2O	
System flow rate	100 SCFM	
Blower Temperature	117°F	
Temp.at lag VPC discharge		
Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration		

PID Model: PPBRAE 3000		Details: 0.0 / 10.00 ppm	
Calibration time/ date: 8/14/20 0835		PID check after monitoring:	

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		2,370 ppb	1950 ppb				
SVE-03		8,853 ppb	9,260 ppb				
VPC Inlet		5,720 ppb	5,975 ppb				
VPC Midpoint							
VPC Outlet		0 ppb	0 ppb				
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606

At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature Justin Neste (Printed Name) _____ (Signature) 8/14/20 (Date)

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 8/20/20 Date of last inspection: 8/14/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.		
Inspection Time: 1053		Motor Hours: 2780.5
Blower	**Current Value**	**Other Notes**
Vacuum gauge	28" H20	
Pressure gauge	5" H20	
System flow rate	100 SCFM	PTW @ 4:78/79
Blower Temperature	129°F	B-17 = 4.72'
Temp.at lag VPC discharge		B-20 = 4.99'
Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration		

PID Model: PPBRAE 3000	Details:
Calibration time/ date:	PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		1,793 ppb	1,341 ppb				
SVE-03		1,517 ppb	1,456 ppb				
VPC Inlet		2,312 ppb	1,801 ppb				
VPC Midpoint							
VPC Outlet							
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature _____ Printed Name _____ Signature _____ Date

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 8/26/20 Date of last inspection: 8/20/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.		
Inspection Time: 0630		Motor Hours: 2920.1
Blower	**Current Value**	**Other Notes**
Vacuum gauge	32" H20	
Pressure gauge	2" H20	
System flow rate	100 SCFM	DTW - 478/79
Blower Temperature	121°F	B17 = 4.76'
Temp.at lag VPC discharge		B20 = 5.07'
Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration		

PID Model: PPB RAE 3000	Details: 0 ppb / 10.00 ppm
Calibration time/ date: 8/26/20 0630	PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		976 ppb	726 ppb				
SVE-03		13.52 ppm	15.24 ppm				
VPC Inlet		6,525 ppb	6,776 ppb				
VPC Midpoint							
VPC Outlet		0 ppb	0 ppb				
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature Justin Neste (Printed Name) [signature] (Signature) 8/26/20 (Date)

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 9/2/20 Date of last inspection: 8/26/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.

Inspection Time: 0800 Motor Hours: 3089.5

Blower	Current Value
Vacuum gauge	32" H20
Pressure gauge	2" H20
System flow rate	100 SCFM
Blower Temperature	125°F
Temp.at lag VPC discharge	

Other Notes

DTW @ 478/79
B-17 = 4.82'
B-20 = 5.14'

Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration

PID Model: PPB RAE 3000 Details: 0.0 ppb / 10.00 ppm

Calibration time/ date: 9/2/20 0800 PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02		76 ppb	65 ppb				
SVE-03		1,699 ppb	1,805 ppb				
VPC Inlet		1,052 ppb	1,160 ppb				
VPC Midpoint							
VPC Outlet		0 ppb	0 ppb				
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature Justin Neste (Printed Name) (Signature) 9/2/20 (Date)

Renton Cleanup Action SVE System – SWMU 172/174
Field Operations Log Form

Inspection Date: 9/23/20 Date of last inspection: 9/2/20

Periodic systems check:
1) Check flowrate, vacuum, pressure, moisture separator, water storage drums
2) Check each SVE well, VPC inlet, and VPC outlet with PID.

Operational Parameters - Monitoring interval is variable.

Inspection Time: 0656 / 1230

Motor Hours: 3519.9 / 3521.0

Blower	Current Value
Vacuum gauge	43"H20 / 43"H20
Pressure gauge	2"H20 / 2"H20
System flow rate	98 SCFM / 100 SCFM
Blower Temperature	95°F / 125°F
Temp.at lag VPC discharge	

Other Notes

Restart System @ 0700 (was down @ arrival). Will sample @ 478/79 then return to screen A sample.

Returned @ 1230

Collected TO15 samples from SVE 2, SVE 3, SVEIN

Other notes: check oil level, drive belts, TEFC motor fan, any unusual noise/vibration

PID Model: PPBRAE 3000

Details: 0 ppb / 10.01 ppm

Calibration time/ date: 9/23/20 0700

PID check after monitoring:

Sampling Point	Time	PID Reading (1)	PID Reading (2)	Vacuum	Flow Rate (gauge)	Differential Pressure	Flow Rate Calculated[1]
SVE-01	Vent						
SVE-02	1250	402 ppb	358 ppb				
SVE-03	1255	1,307 ppb	1,317 ppb				
VPC Inlet	1300	604 ppb	562 ppb				
VPC Midpoint							
VPC Outlet							
Other vapor point _____							

1. Flow rate calculated from the equation $Flow\ Rate\ (cfm) = 12.24 \times \sqrt{differential\ pressure}$.

Questions? Call Justin Neste @ (360) 981-5606
At the Completion of a monitoring event scan monitoring forms and email to Justin Neste: Justin.Neste@calibresys.com

Signature: Justin Neste (Printed Name) _____ (Signature) 9/23/20 (Date)

Attachment B: Laboratory Data Packages

Analytical Resources, Incorporated
Analytical Chemists and Consultants

15 October 2020

Nick Garson
The Boeing Company
PO Box 3707 M/S 1W-12
Seattle, WA 98124

RE: Boeing Renton Regional GW Building 4-78/79

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
20I0337	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 20I0337	Turn-around Requested: Standard	Page: 1 of 2	
ARI Client Company: Boeing	Phone: 425-269-7866	Date:	Ice Present? Yes
Client Contact: Nick Garson		No. of Coolers: 1	Cooler Temps: 4.4
Client Project Name: Renton 4-78/79			
Client Project #:	Samplers: RLassen JNeste		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOCs	Nitrite NO2 / Nitrate NO3	SO4 Sulfate						Notes/Comments
													VOCs - TCE cisDCE, VC Benzene
B78-21-092320	9/23/20	0815	Aq	5	X	X	X						
B78-17-092320		0830											
GW-031S-092320		0900											
B78-18-092320		0910											
DUP01-092320		0800											
B78-13-092320		0947											
B78-19-092320		1005											
GW-244S-092320		1030											
B78-20-092320		1055											
B78-11-092320		1110											

Comments/Special Instructions
CC Tom McLean
Justin Neste
Rune Lassen

Relinquished by: (Signature)		Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Printed Name:	Rune Lassen	Printed Name:	Printed Name:	Printed Name:
Company:	Calibre	Company: ARI	Company:	Company:
Date & Time:	9/23/20 1327	Date & Time: 09/23/2020 1327	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 20I0337	Turn-around Requested: Standard	Page: 2 of 2	
ARI Client Company: Boeing	Phone: 425-269-7866	Date: 9/23/20	Ice Present? Yes
Client Contact: ~~Boeing~~ Nick Garson		No. of Coolers: 1	Cooler Temps: 4.9
Client Project Name: Renton 4-78179			
Client Project #:	Samplers: R Lassen J Neske		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOC								Notes/Comments
TRIP Blank	9/23/20	—		2	x								VOC, TCE, cis DCE, VC, Benzene

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
CC Tom McKeon Justin Neske Rune Lassen	Printed Name: Rene Lassen	Printed Name: Jen Blatt	Printed Name:	Printed Name:
	Company: Calibre	Company: ARI	Company:	Company:
	Date & Time: 9/23/20 1327	Date & Time: 09/23/2020 1327	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B78-21-092320	20I0337-01	Water	23-Sep-2020 08:15	23-Sep-2020 13:27
B78-17-092320	20I0337-02	Water	23-Sep-2020 08:30	23-Sep-2020 13:27
GW-031S-092320	20I0337-03	Water	23-Sep-2020 09:00	23-Sep-2020 13:27
B78-18-092320	20I0337-04	Water	23-Sep-2020 09:10	23-Sep-2020 13:27
DUP01-092320	20I0337-05	Water	23-Sep-2020 08:00	23-Sep-2020 13:27
B78-13-092320	20I0337-06	Water	23-Sep-2020 09:47	23-Sep-2020 13:27
B78-19-092320	20I0337-07	Water	23-Sep-2020 10:05	23-Sep-2020 13:27
GW-244S-092320	20I0337-08	Water	23-Sep-2020 10:30	23-Sep-2020 13:27
B78-20-092320	20I0337-09	Water	23-Sep-2020 10:55	23-Sep-2020 13:27
B78-11-092320	20I0337-10	Water	23-Sep-2020 11:10	23-Sep-2020 13:27
Trip Blanks	20I0337-11	Water	23-Sep-2020 08:15	23-Sep-2020 13:27

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

Work Order Case Narrative

Volatiles - EPA Method SW8260D

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The reference material (SRM) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

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WORK ORDER

20I0337

Client: The Boeing Company	**Project Manager:** Kelly Bottem
Project: Boeing Renton Regional GW Building 4-78/79	**Project Number:** Boeing Renton Regional GW Building 4-78/79

Preservation Confirmation

Container ID	Container Type	pH
20I0337-01 A	Small OJ, 500 mL	
20I0337-01 B	Small OJ, 500 mL	
20I0337-01 C	VOA Vial, Clear, 40 mL, HCL	
20I0337-01 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-01 E	VOA Vial, Clear, 40 mL, HCL	
20I0337-02 A	Small OJ, 500 mL	
20I0337-02 B	Small OJ, 500 mL	
20I0337-02 C	VOA Vial, Clear, 40 mL, HCL	Bubble
20I0337-02 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-02 E	VOA Vial, Clear, 40 mL, HCL	
20I0337-03 A	Small OJ, 500 mL	
20I0337-03 B	Small OJ, 500 mL	
20I0337-03 C	VOA Vial, Clear, 40 mL, HCL	
20I0337-03 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-03 E	VOA Vial, Clear, 40 mL, HCL	
20I0337-04 A	Small OJ, 500 mL	
20I0337-04 B	Small OJ, 500 mL	
20I0337-04 C	VOA Vial, Clear, 40 mL, HCL	Bubble
20I0337-04 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-04 E	VOA Vial, Clear, 40 mL, HCL	
20I0337-05 A	Small OJ, 500 mL	
20I0337-05 B	Small OJ, 500 mL	
20I0337-05 C	VOA Vial, Clear, 40 mL, HCL	
20I0337-05 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-05 E	VOA Vial, Clear, 40 mL, HCL	
20I0337-06 A	Small OJ, 500 mL	
20I0337-06 B	Small OJ, 500 mL	
20I0337-06 C	VOA Vial, Clear, 40 mL, HCL	
20I0337-06 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-06 E	VOA Vial, Clear, 40 mL, HCL	
20I0337-07 A	Small OJ, 500 mL	
20I0337-07 B	Small OJ, 500 mL	
20I0337-07 C	VOA Vial, Clear, 40 mL, HCL	
20I0337-07 D	VOA Vial, Clear, 40 mL, HCL	
20I0337-07 E	VOA Vial, Clear, 40 mL, HCL	

Reviewed By

Date

WORK ORDER

20I0337

Client: The Boeing Company | **Project Manager:** Kelly Bottem

Project: Boeing Renton Regional GW Building 4-78/79 | **Project Number:** Boeing Renton Regional GW Building 4-78/79

20I0337-08 A	Small OJ, 500 mL
20I0337-08 B	Small OJ, 500 mL
20I0337-08 C	VOA Vial, Clear, 40 mL, HCL
20I0337-08 D	VOA Vial, Clear, 40 mL, HCL
20I0337-08 E	VOA Vial, Clear, 40 mL, HCL
20I0337-09 A	Small OJ, 500 mL
20I0337-09 B	Small OJ, 500 mL
20I0337-09 C	VOA Vial, Clear, 40 mL, HCL Dbl e
20I0337-09 D	VOA Vial, Clear, 40 mL, HCL
20I0337-09 E	VOA Vial, Clear, 40 mL, HCL
20I0337-10 A	Small OJ, 500 mL
20I0337-10 B	Small OJ, 500 mL
20I0337-10 C	VOA Vial, Clear, 40 mL, HCL
20I0337-10 D	VOA Vial, Clear, 40 mL, HCL
20I0337-10 E	VOA Vial, Clear, 40 mL, HCL
20I0337-11 A	VOA Vial, Clear, 40 mL, HCL
20I0337-11 B	VOA Vial, Clear, 40 mL, HCL

JBm
Preservation Confirmed By

09/23/2020
Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Darby/Calibre Project Name: Renton 4-78/79

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 20I0337 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.7

Time 1307

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D00 5006

Cooler Accepted by: JG Date: 09/23/2020 Time: 1307

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	09/21/2020	

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JG Date: 09/23/2020 Time: 1722 Labels checked by: JG

** ***Notify Project Manager of discrepancies or concerns*** **

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

vials w/ air bubble marked on preservation sheet, lab to determine sizes.

By: JG Date: 09/23/2020

The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-21-092320

20I0337-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 08:15

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 15:21

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-01 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	0.25	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.32	ug/L	
Benzene	71-43-2	1	0.20	0.39	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*115*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*97.6*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*89.4*	*%*	

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-21-092320

20I0337-01 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 08:15

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 13:26

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-01 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-21-092320

20I0337-01RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 08:15

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 18:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-01RE1 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	8	0.800	0.800	26.3	mg/L	D

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-17-092320

20I0337-02 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 08:30

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 15:41

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-02 C

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	0.37	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.86	ug/L	
Benzene	71-43-2	1	0.20	0.40	ug/L	
Trichloroethene	79-01-6	1	0.20	0.65	ug/L	
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*114*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*95.9*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*88.5*	*%*	

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-17-092320

20I0337-02 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 08:30

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 14:26

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-02 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	1.63	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-17-092320

20I0337-02RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 08:30

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 19:26

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-02RE1 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	15	1.50	1.50	44.9	mg/L	D

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

GW-031S-092320

20I0337-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 09:00

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 16:02

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-03 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	0.26	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.21	ug/L	
Benzene	71-43-2	1	0.20	0.45	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*115*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*98.9*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*92.8*	*%*	

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

GW-031S-092320

20I0337-03 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 09:00

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 14:46

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-03 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	2.39	mg/L	

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-18-092320

20I0337-04 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 09:10

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 16:22

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-04 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.27	ug/L	
Benzene	71-43-2	1	0.20	1.05	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*114*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*98.8*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*94.4*	*%*	

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-18-092320

20I0337-04 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 09:10

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 15:06

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-04 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-18-092320

20I0337-04RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 09:10

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 19:46

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-04RE1 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	12	1.20	1.20	70.2	mg/L	D

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

DUP01-092320

20I0337-05 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 08:00

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 16:43

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-05 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.22	ug/L	
Benzene	71-43-2	1	0.20	0.45	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*113*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*99.1*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*92.9*	*%*	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

DUP01-092320

20I0337-05 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 08:00
Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 15:26

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-05 A
Preparation Batch: BII0679 — Sample Size: 10 mL
Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	2.52	mg/L	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-13-092320

20I0337-06 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 09:47

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 17:03

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-06 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	0.41	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.44	ug/L	
Benzene	71-43-2	1	0.20	1.00	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*113*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*97.1*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*89.9*	*%*	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-13-092320

20I0337-06 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 09:47

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 16:47

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-06 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	0.396	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-13-092320

20I0337-06RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 09:47

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 20:46

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-06RE1 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	12	1.20	1.20	13.9	mg/L	D

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-19-092320

20I0337-07 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 10:05

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 17:23

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-07 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*108*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*98.5*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*90.1*	*%*	

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Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-19-092320

20I0337-07 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 10:05

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 17:07

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-07 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	0.110	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	1.97	mg/L	

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Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

GW-244S-092320

20I0337-08 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 10:30

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 17:44

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-08 D

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	0.39	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.26	ug/L	
Benzene	71-43-2	1	0.20	0.20	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*111*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*97.7*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*90.0*	*%*	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

GW-244S-092320

20I0337-08 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 10:30

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 17:27

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-08 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	3.96	mg/L	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-20-092320

20I0337-09 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 10:55

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 18:04

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-09 C

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	0.37	ug/L	
Benzene	71-43-2	1	0.20	9.07	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*117*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*99.9*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*92.7*	*%*	

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B78-20-092320

20I0337-09 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 10:55

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 17:47

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-09 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-20-092320

20I0337-09RE1 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 10:55

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 21:25

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-09RE1 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	7	0.700	0.700	40.3	mg/L	D

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Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-11-092320

20I0337-10 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 11:10

Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 18:25

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-10 C

Preparation Batch: BII0762 — Sample Size: 10 mL

Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	3.52	ug/L	
cis-1,2-Dichloroethene	156-59-2	1	0.20	3.14	ug/L	
Benzene	71-43-2	1	0.20	2.64	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*113*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*98.7*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*90.3*	*%*	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

B78-11-092320

20I0337-10 (Water)

Wet Chemistry

Method: EPA 300.0 — Sampled: 09/23/2020 11:10

Instrument: IC930 Analyst: CDE — Analyzed: 09/24/2020 18:07

Sample Preparation: Preparation Method: No Prep Wet Chem — Extract ID: 20I0337-10 A

Preparation Batch: BII0679 — Sample Size: 10 mL

Prepared: 09/24/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrate-N	14797-55-8	1	0.100	0.100	0.205	mg/L	

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Nitrite-N	14797-65-0	1	0.100	0.100	ND	mg/L	U

Analyte	CAS Number	Dilution	Detection Limit	Reporting Limit	Result	Units	Notes
Sulfate	14808-79-8	1	0.100	0.100	2.38	mg/L	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

Trip Blanks

20I0337-11 (Water)

Volatile Organic Compounds

Method: EPA 8260D — Sampled: 09/23/2020 08:15
Instrument: NT2 Analyst: PKC — Analyzed: 09/26/2020 12:58

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap) — Extract ID: 20I0337-11 A
Preparation Batch: BII0762 — Sample Size: 10 mL
Prepared: 09/26/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl Chloride	75-01-4	1	0.20	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
Surrogate: 1,2-Dichloroethane-d4			*80-129 %*	*106*	*%*	
Surrogate: Toluene-d8			*80-120 %*	*96.4*	*%*	
Surrogate: 4-Bromofluorobenzene			*80-120 %*	*90.4*	*%*	

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PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

Volatile Organic Compounds - Quality Control

Batch BII0762 - EPA 5030C (Purge and Trap)

Instrument: NT2 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BII0762-BLK2)				Prepared: 26-Sep-2020 Analyzed: 26-Sep-2020 12:16						
Vinyl Chloride	ND	0.20	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	5.26		ug/L	*5.00*		*105*	*80-129*			
Surrogate: Toluene-d8	4.87		ug/L	*5.00*		*97.4*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.54		ug/L	*5.00*		*90.9*	*80-120*			
LCS (BII0762-BS2)				Prepared: 26-Sep-2020 Analyzed: 26-Sep-2020 11:14						
Vinyl Chloride	9.34	0.20	ug/L	10.0		93.4	66-133			
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121			
Benzene	10.4	0.20	ug/L	10.0		104	80-120			
Trichloroethene	10.1	0.20	ug/L	10.0		101	80-120			
Surrogate: 1,2-Dichloroethane-d4	5.03		ug/L	*5.00*		*101*	*80-129*			
Surrogate: Toluene-d8	5.02		ug/L	*5.00*		*100*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.84		ug/L	*5.00*		*96.7*	*80-120*			
LCS Dup (BII0762-BSD2)				Prepared: 26-Sep-2020 Analyzed: 26-Sep-2020 11:35						
Vinyl Chloride	9.27	0.20	ug/L	10.0		92.7	66-133	0.78	30	
cis-1,2-Dichloroethene	10.3	0.20	ug/L	10.0		103	80-121	0.93	30	
Benzene	10.6	0.20	ug/L	10.0		106	80-120	1.97	30	
Trichloroethene	10.3	0.20	ug/L	10.0		103	80-120	2.36	30	
Surrogate: 1,2-Dichloroethane-d4	5.00		ug/L	*5.00*		*100*	*80-129*			
Surrogate: Toluene-d8	4.94		ug/L	*5.00*		*98.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4.83		ug/L	*5.00*		*96.5*	*80-120*			

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

Wet Chemistry - Quality Control

Batch BII0679 - No Prep Wet Chem

Instrument: IC930 Analyst: CDE

QC Sample/Analyte	Result	Detection Limit	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BII0679-BLK1)				Prepared: 24-Sep-2020 Analyzed: 24-Sep-2020 12:46							
Nitrate-N	ND	0.100	0.100	mg/L							U
Nitrite-N	ND	0.100	0.100	mg/L							U
Sulfate	ND	0.100	0.100	mg/L							U
LCS (BII0679-BS1)				Prepared: 24-Sep-2020 Analyzed: 24-Sep-2020 13:06							
Nitrate-N	4.90	0.100	0.100	mg/L	5.00		98.0	90-110			
Nitrite-N	4.98	0.100	0.100	mg/L	5.00		99.7	90-110			
Sulfate	5.15	0.100	0.100	mg/L	5.00		103	90-110			
Duplicate (BII0679-DUP1)		**Source: 20I0337-01**		Prepared: 24-Sep-2020 Analyzed: 24-Sep-2020 13:46							
Nitrate-N	ND	0.100	0.100	mg/L		ND					U
Nitrite-N	ND	0.100	0.100	mg/L		ND					U
Duplicate (BII0679-DUP2)		**Source: 20I0337-01RE1**		Prepared: 24-Sep-2020 Analyzed: 24-Sep-2020 18:47							
Sulfate	26.7	0.800	0.800	mg/L		26.3			1.37	20	D
Matrix Spike (BII0679-MS1)		**Source: 20I0337-01**		Prepared: 24-Sep-2020 Analyzed: 24-Sep-2020 14:06							
Nitrate-N	1.97	0.100	0.100	mg/L	2.00	ND	98.3	75-125			
Nitrite-N	1.61	0.100	0.100	mg/L	2.00	ND	80.4	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Matrix Spike (BII0679-MS2)		**Source: 20I0337-01RE1**		Prepared: 24-Sep-2020 Analyzed: 24-Sep-2020 19:06							
Sulfate	45.7	0.900	0.900	mg/L	20.0	26.3	96.7	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Certified Analyses included in this Report

Analyte	Certifications
EPA 300.0 in Water	
Nitrate-N	DoD-ELAP,WADOE,WA-DW
Nitrate-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrate-N	DoD-ELAP,WA-DW,NELAP
Nitrate-N	DoD-ELAP,WADOE,NELAP
Nitrite-N	DoD-ELAP,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,WA-DW
Nitrite-N	DoD-ELAP,WADOE,WA-DW,NELAP
Nitrite-N	DoD-ELAP,WADOE,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,WA-DW
Sulfate	DoD-ELAP,WA-DW,NELAP
Sulfate	DoD-ELAP,WADOE,NELAP
EPA 8260D in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP
Chloromethane	DoD-ELAP,ADEC,CALAP,WADOE
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP
Vinyl Chloride	DoD-ELAP,ADEC,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP
Acrolein	DoD-ELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP

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Acrolein	DoD-ELAP,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP
Iodomethane	DoD-ELAP,NELAP,WADOE
Iodomethane	DoD-ELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP
Methylene Chloride	DoD-ELAP,ADEC,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP
Acrylonitrile	DoD-ELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP
Vinyl Acetate	DoD-ELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP

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1,1-Dichloroethane	DoD-ELAP,ADEC,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2-Butanone	DoD-ELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP
Bromochloromethane	DoD-ELAP,ADEC,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP
1,1-Dichloropropene	DoD-ELAP,ADEC,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE

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Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP
Benzene	DoD-ELAP,ADEC,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP
Dibromomethane	DoD-ELAP,ADEC,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,CALAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP

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trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP
2-Hexanone	DoD-ELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP
Tetrachloroethene	DoD-ELAP,ADEC,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,CALAP,WADOE

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m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP
o-Xylene	DoD-ELAP,ADEC,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP
Styrene	DoD-ELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP
n-Propylbenzene	DoD-ELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP
Bromobenzene	DoD-ELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP
Isopropyl Benzene	DoD-ELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE

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2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP
t-Butylbenzene	DoD-ELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP
1,3,5-Trimethylbenzene	DoD-ELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP
s-Butylbenzene	DoD-ELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP
n-Butylbenzene	DoD-ELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP
n-Butylbenzene	DoD-ELAP,NELAP,WADOE

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP
1,2-Dichlorobenzene	DoD-ELAP,ADEC,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP
Naphthalene	DoD-ELAP,ADEC,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP
Methyl tert-butyl Ether	DoD-ELAP,ADEC,CALAP,WADOE
n-Hexane	WADOE
n-Hexane	WADOE
n-Hexane	
n-Hexane	WADOE
2-Pentanone	WADOE
2-Pentanone	WADOE
2-Pentanone	

The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

2-Pentanone WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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The Boeing Company	Project: Boeing Renton Regional GW Building 4-78/79	
PO Box 3707 M/S 1W-12	Project Number: Boeing Renton Regional GW Building 4-78/79	**Reported:**
Seattle WA, 98124	Project Manager: Nick Garson	15-Oct-2020 18:05

Notes and Definitions

*	Flagged value is not within established control limits.
D	The reported value is from a dilution
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

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10/9/2020
Mr. Justin Neste
CALIBRE, Environmental Technology Solutions
20926 Pugh Rd NE

Poulsbo WA 98370

Project Name: Renton 5-09
Project #:
Workorder #: 2009744

Dear Mr. Justin Neste

The following report includes the data for the above referenced project for sample(s) received on 9/25/2020 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2009744

Work Order Summary

CLIENT:	Mr. Justin Neste CALIBRE, Environmental Technology Solutions 20926 Pugh Rd NE Poulsbo, WA 98370	**BILL TO:**	Accounts Payable Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	360-981-5606	**P.O. #**	
FAX:		**PROJECT #**	Renton 5-09
DATE RECEIVED:	09/25/2020	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	10/09/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVE-2-092320	TO-15	4.9 "Hg	14.9 psi
02A	SVE-3-092320	TO-15	4.5 "Hg	14.8 psi
03A	SVE-IN-092320	TO-15	3.7 "Hg	14.9 psi
04A	Lab Blank	TO-15	NA	NA
05A	CCV	TO-15	NA	NA
06A	LCS	TO-15	NA	NA
06AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 10/09/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
CALIBRE, Environmental Technology Solutions
Workorder# 2009744

Three 1 Liter Summa Canister samples were received on September 25, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Dilution was performed on sample SVE-3-092320 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SVE-2-092320

Lab ID#: 2009744-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	1.2	5.6	4.8	22
Chloroform	1.2	1.9	5.9	9.1
Trichloroethene	1.2	6.7	6.5	36
Tetrachloroethene	1.2	42	8.2	280

Client Sample ID: SVE-3-092320

Lab ID#: 2009744-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	2.4	11	9.4	43
1,1,1-Trichloroethane	2.4	6.0	13	33
Trichloroethene	2.4	37	13	200
Toluene	2.4	3.8	8.9	14
Tetrachloroethene	2.4	410	16	2800

Client Sample ID: SVE-IN-092320

Lab ID#: 2009744-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
cis-1,2-Dichloroethene	1.2	3.7	4.6	15
1,1,1-Trichloroethane	1.2	1.8	6.3	9.9
Trichloroethene	1.2	11	6.2	58
Tetrachloroethene	1.2	110	7.8	730

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Client Sample ID: SVE-2-092320

Lab ID#: 2009744-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100826**	**Date of Collection:**	**9/23/20 12:51:00**
Dil. Factor:	**2.41**	**Date of Analysis:**	**10/9/20 02:31 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloromethane	12	Not Detected	25	Not Detected
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
Freon 113	1.2	Not Detected	9.2	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Acetone	12	Not Detected	29	Not Detected
Carbon Disulfide	4.8	Not Detected	15	Not Detected
Methylene Chloride	12	Not Detected	42	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Hexane	1.2	Not Detected	4.2	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.9	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.8	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	5.6	4.8	22
Chloroform	1.2	1.9	5.9	9.1
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Benzene	1.2	Not Detected	3.8	Not Detected
Trichloroethene	1.2	6.7	6.5	36
Toluene	1.2	Not Detected	4.5	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.6	Not Detected
Tetrachloroethene	1.2	42	8.2	280
Chlorobenzene	1.2	Not Detected	5.5	Not Detected
Ethyl Benzene	1.2	Not Detected	5.2	Not Detected
m,p-Xylene	1.2	Not Detected	5.2	Not Detected
o-Xylene	1.2	Not Detected	5.2	Not Detected
Styrene	1.2	Not Detected	5.1	Not Detected
Cumene	1.2	Not Detected	5.9	Not Detected
Propylbenzene	1.2	Not Detected	5.9	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.9	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.9	Not Detected
TPH ref. to Gasoline (MW=100)	120	Not Detected	490	Not Detected
Acetonitrile	12	Not Detected	20	Not Detected
Vinyl Acetate	4.8	Not Detected	17	Not Detected
Octane	4.8	Not Detected	22	Not Detected
Pentane	4.8	Not Detected	14	Not Detected
Butylbenzene	4.8	Not Detected	26	Not Detected
Decane	4.8	Not Detected	28	Not Detected
Dodecane	12	Not Detected	84	Not Detected
sec-Butylbenzene	4.8	Not Detected	26	Not Detected
p-Cymene	4.8	Not Detected	26	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits

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Client Sample ID: SVE-2-092320

Lab ID#: 2009744-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100826**	**Date of Collection:**	**9/23/20 12:51:00**
Dil. Factor:	**2.41**	**Date of Analysis:**	**10/9/20 02:31 AM**

Surrogates	%Recovery	Method Limits
Toluene-d8	91	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: SVE-3-092320

Lab ID#: 2009744-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100827**	**Date of Collection:**	**9/23/20 12:56:00**
Dil. Factor:	**4.72**	**Date of Analysis:**	**10/9/20 02:58 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloromethane	24	Not Detected	49	Not Detected
Vinyl Chloride	2.4	Not Detected	6.0	Not Detected
Freon 113	2.4	Not Detected	18	Not Detected
1,1-Dichloroethene	2.4	Not Detected	9.4	Not Detected
Acetone	24	Not Detected	56	Not Detected
Carbon Disulfide	9.4	Not Detected	29	Not Detected
Methylene Chloride	24	Not Detected	82	Not Detected
trans-1,2-Dichloroethene	2.4	Not Detected	9.4	Not Detected
Hexane	2.4	Not Detected	8.3	Not Detected
1,1-Dichloroethane	2.4	Not Detected	9.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	9.4	Not Detected	28	Not Detected
cis-1,2-Dichloroethene	2.4	11	9.4	43
Chloroform	2.4	Not Detected	12	Not Detected
1,1,1-Trichloroethane	2.4	6.0	13	33
Benzene	2.4	Not Detected	7.5	Not Detected
Trichloroethene	2.4	37	13	200
Toluene	2.4	3.8	8.9	14
1,1,2-Trichloroethane	2.4	Not Detected	13	Not Detected
Tetrachloroethene	2.4	410	16	2800
Chlorobenzene	2.4	Not Detected	11	Not Detected
Ethyl Benzene	2.4	Not Detected	10	Not Detected
m,p-Xylene	2.4	Not Detected	10	Not Detected
o-Xylene	2.4	Not Detected	10	Not Detected
Styrene	2.4	Not Detected	10	Not Detected
Cumene	2.4	Not Detected	12	Not Detected
Propylbenzene	2.4	Not Detected	12	Not Detected
1,3,5-Trimethylbenzene	2.4	Not Detected	12	Not Detected
1,2,4-Trimethylbenzene	2.4	Not Detected	12	Not Detected
TPH ref. to Gasoline (MW=100)	240	Not Detected	960	Not Detected
Acetonitrile	24	Not Detected	40	Not Detected
Vinyl Acetate	9.4	Not Detected	33	Not Detected
Octane	9.4	Not Detected	44	Not Detected
Pentane	9.4	Not Detected	28	Not Detected
Butylbenzene	9.4	Not Detected	52	Not Detected
Decane	9.4	Not Detected	55	Not Detected
Dodecane	24	Not Detected	160	Not Detected
sec-Butylbenzene	9.4	Not Detected	52	Not Detected
p-Cymene	9.4	Not Detected	52	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits

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Client Sample ID: SVE-3-092320

Lab ID#: 2009744-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100827**	**Date of Collection:**	**9/23/20 12:56:00**
Dil. Factor:	**4.72**	**Date of Analysis:**	**10/9/20 02:58 AM**

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: SVE-IN-092320

Lab ID#: 2009744-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100828**	**Date of Collection:**	**9/23/20 13:01:00**
Dil. Factor:	**2.30**	**Date of Analysis:**	**10/9/20 03:28 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloromethane	12	Not Detected	24	Not Detected
Vinyl Chloride	1.2	Not Detected	2.9	Not Detected
Freon 113	1.2	Not Detected	8.8	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Acetone	12	Not Detected	27	Not Detected
Carbon Disulfide	4.6	Not Detected	14	Not Detected
Methylene Chloride	12	Not Detected	40	Not Detected
trans-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Hexane	1.2	Not Detected	4.0	Not Detected
1,1-Dichloroethane	1.2	Not Detected	4.6	Not Detected
2-Butanone (Methyl Ethyl Ketone)	4.6	Not Detected	14	Not Detected
cis-1,2-Dichloroethene	1.2	3.7	4.6	15
Chloroform	1.2	Not Detected	5.6	Not Detected
1,1,1-Trichloroethane	1.2	1.8	6.3	9.9
Benzene	1.2	Not Detected	3.7	Not Detected
Trichloroethene	1.2	11	6.2	58
Toluene	1.2	Not Detected	4.3	Not Detected
1,1,2-Trichloroethane	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	110	7.8	730
Chlorobenzene	1.2	Not Detected	5.3	Not Detected
Ethyl Benzene	1.2	Not Detected	5.0	Not Detected
m,p-Xylene	1.2	Not Detected	5.0	Not Detected
o-Xylene	1.2	Not Detected	5.0	Not Detected
Styrene	1.2	Not Detected	4.9	Not Detected
Cumene	1.2	Not Detected	5.6	Not Detected
Propylbenzene	1.2	Not Detected	5.6	Not Detected
1,3,5-Trimethylbenzene	1.2	Not Detected	5.6	Not Detected
1,2,4-Trimethylbenzene	1.2	Not Detected	5.6	Not Detected
TPH ref. to Gasoline (MW=100)	120	Not Detected	470	Not Detected
Acetonitrile	12	Not Detected	19	Not Detected
Vinyl Acetate	4.6	Not Detected	16	Not Detected
Octane	4.6	Not Detected	21	Not Detected
Pentane	4.6	Not Detected	14	Not Detected
Butylbenzene	4.6	Not Detected	25	Not Detected
Decane	4.6	Not Detected	27	Not Detected
Dodecane	12	Not Detected	80	Not Detected
sec-Butylbenzene	4.6	Not Detected	25	Not Detected
p-Cymene	4.6	Not Detected	25	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits

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Client Sample ID: SVE-IN-092320

Lab ID#: 2009744-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100828**	**Date of Collection:**	**9/23/20 13:01:00**
Dil. Factor:	**2.30**	**Date of Analysis:**	**10/9/20 03:28 AM**

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2009744-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100806e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 02:11 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Chloromethane	5.0	Not Detected	10	Not Detected
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
Freon 113	0.50	Not Detected	3.8	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Acetone	5.0	Not Detected	12	Not Detected
Carbon Disulfide	2.0	Not Detected	6.2	Not Detected
Methylene Chloride	5.0	Not Detected	17	Not Detected
trans-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Hexane	0.50	Not Detected	1.8	Not Detected
1,1-Dichloroethane	0.50	Not Detected	2.0	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.0	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Chloroform	0.50	Not Detected	2.4	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Benzene	0.50	Not Detected	1.6	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Toluene	0.50	Not Detected	1.9	Not Detected
1,1,2-Trichloroethane	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected
Chlorobenzene	0.50	Not Detected	2.3	Not Detected
Ethyl Benzene	0.50	Not Detected	2.2	Not Detected
m,p-Xylene	0.50	Not Detected	2.2	Not Detected
o-Xylene	0.50	Not Detected	2.2	Not Detected
Styrene	0.50	Not Detected	2.1	Not Detected
Cumene	0.50	Not Detected	2.4	Not Detected
Propylbenzene	0.50	Not Detected	2.4	Not Detected
1,3,5-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
1,2,4-Trimethylbenzene	0.50	Not Detected	2.4	Not Detected
TPH ref. to Gasoline (MW=100)	50	Not Detected	200	Not Detected
Acetonitrile	5.0	Not Detected	8.4	Not Detected
Vinyl Acetate	2.0	Not Detected	7.0	Not Detected
Octane	2.0	Not Detected	9.3	Not Detected
Pentane	2.0	Not Detected	5.9	Not Detected
Butylbenzene	2.0	Not Detected	11	Not Detected
Decane	2.0	Not Detected	12	Not Detected
Dodecane	5.0	Not Detected	35	Not Detected
sec-Butylbenzene	2.0	Not Detected	11	Not Detected
p-Cymene	2.0	Not Detected	11	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits

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Client Sample ID: Lab Blank

Lab ID#: 2009744-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100806e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 02:11 PM**	

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: CCV

Lab ID#: 2009744-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 11:00 AM**	

Compound	%Recovery
Chloromethane	82
Vinyl Chloride	73
Freon 113	84
1,1-Dichloroethene	88
Acetone	83
Carbon Disulfide	82
Methylene Chloride	86
trans-1,2-Dichloroethene	91
Hexane	89
1,1-Dichloroethane	90
2-Butanone (Methyl Ethyl Ketone)	94
cis-1,2-Dichloroethene	88
Chloroform	89
1,1,1-Trichloroethane	87
Benzene	91
Trichloroethene	93
Toluene	98
1,1,2-Trichloroethane	93
Tetrachloroethene	92
Chlorobenzene	92
Ethyl Benzene	98
m,p-Xylene	95
o-Xylene	99
Styrene	106
Cumene	99
Propylbenzene	99
1,3,5-Trimethylbenzene	99
1,2,4-Trimethylbenzene	100
TPH ref. to Gasoline (MW=100)	100
Acetonitrile	91
Vinyl Acetate	88
Octane	98
Pentane	86
Butylbenzene	103
Decane	101
Dodecane	105
sec-Butylbenzene	98
p-Cymene	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits

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Client Sample ID: CCV

Lab ID#: 2009744-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100802**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 11:00 AM**	

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: LCS

Lab ID#: 2009744-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100803c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 11:44 AM**	

Compound	%Recovery	Method Limits
Chloromethane	79	70-130
Vinyl Chloride	74	70-130
Freon 113	84	70-130
1,1-Dichloroethene	90	70-130
Acetone	82	70-130
Carbon Disulfide	82	70-130
Methylene Chloride	84	70-130
trans-1,2-Dichloroethene	91	70-130
Hexane	89	70-130
1,1-Dichloroethane	88	70-130
2-Butanone (Methyl Ethyl Ketone)	94	70-130
cis-1,2-Dichloroethene	92	70-130
Chloroform	88	70-130
1,1,1-Trichloroethane	87	70-130
Benzene	89	70-130
Trichloroethene	92	70-130
Toluene	96	70-130
1,1,2-Trichloroethane	94	70-130
Tetrachloroethene	92	70-130
Chlorobenzene	94	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	95	70-130
o-Xylene	98	70-130
Styrene	104	70-130
Cumene	97	70-130
Propylbenzene	98	70-130
1,3,5-Trimethylbenzene	97	70-130
1,2,4-Trimethylbenzene	100	70-130
TPH ref. to Gasoline (MW=100)	Not Spiked	
Acetonitrile	Not Spiked	0-0
Vinyl Acetate	91	70-130
Octane	Not Spiked	0-0
Pentane	Not Spiked	0-0
Butylbenzene	Not Spiked	0-0
Decane	Not Spiked	0-0
Dodecane	Not Spiked	0-0
sec-Butylbenzene	Not Spiked	0-0
p-Cymene	Not Spiked	0-0

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits

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Client Sample ID: LCS

Lab ID#: 2009744-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100803c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 11:44 AM**	

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCSD

Lab ID#: 2009744-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100804c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 12:29 PM**	

Compound	%Recovery	Method Limits
Chloromethane	81	70-130
Vinyl Chloride	75	70-130
Freon 113	86	70-130
1,1-Dichloroethene	90	70-130
Acetone	84	70-130
Carbon Disulfide	81	70-130
Methylene Chloride	85	70-130
trans-1,2-Dichloroethene	91	70-130
Hexane	90	70-130
1,1-Dichloroethane	90	70-130
2-Butanone (Methyl Ethyl Ketone)	96	70-130
cis-1,2-Dichloroethene	92	70-130
Chloroform	89	70-130
1,1,1-Trichloroethane	89	70-130
Benzene	91	70-130
Trichloroethene	94	70-130
Toluene	98	70-130
1,1,2-Trichloroethane	93	70-130
Tetrachloroethene	92	70-130
Chlorobenzene	93	70-130
Ethyl Benzene	99	70-130
m,p-Xylene	96	70-130
o-Xylene	98	70-130
Styrene	103	70-130
Cumene	97	70-130
Propylbenzene	98	70-130
1,3,5-Trimethylbenzene	96	70-130
1,2,4-Trimethylbenzene	101	70-130
TPH ref. to Gasoline (MW=100)	Not Spiked	
Acetonitrile	Not Spiked	0-0
Vinyl Acetate	91	70-130
Octane	Not Spiked	0-0
Pentane	Not Spiked	0-0
Butylbenzene	Not Spiked	0-0
Decane	Not Spiked	0-0
Dodecane	Not Spiked	0-0
sec-Butylbenzene	Not Spiked	0-0
p-Cymene	Not Spiked	0-0

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits

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Client Sample ID: LCSD

Lab ID#: 2009744-06AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3100804c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 10/8/20 12:29 PM**	

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	100	70-130