

**2017 Annual Report
SWMU-17 Remedial Action
Enhanced Anaerobic Bioremediation
Boeing Developmental Center
Tukwila, Washington**

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Prepared for

**The Boeing Company
Seattle, Washington**



130 2nd Avenue South
Edmonds, WA 98020
(425) 778-0907

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Boeing Developmental Center**

This document was prepared by, or under the direct supervision of, the technical professionals noted below.

Document prepared by:  Ken J. Reid, LEG
Senior Geologist; Project Manager

Document reviewed by:  Clinton L. Jacob, PE, LG
Principal; Quality Reviewer

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Project Coordinator: ljl

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LIST OF ABBREVIATIONS AND ACRONYMS

µg/L.....	micrograms per liter
µmoles/L.....	micromoles per liter
Addendum.....	Addendum No. 1, SWMU-17 Remedial Action Work Plan
Boeing.....	The Boeing Company
cDCE.....	cis-1,2-dichloroethene
CO ₂	carbon dioxide
CULs.....	cleanup levels
CVOCs.....	chlorinated volatile organic compounds
DC.....	Developmental Center
DHC.....	dehalococoides
DO.....	dissolved oxygen
Ecology.....	Washington State Department of Ecology
EPA.....	US Environmental Protection Agency
FeCl ₂	ferrous chloride
ft.....	feet
gpm.....	gallons per minute
IWs.....	injection wells
lbs.....	pounds
MEEA.....	methane/ethane/ethene/acetylene
mg/L.....	milligrams per liter
MTCA.....	Model Toxics Control Act
MWs.....	monitoring wells
ORP.....	oxidation-reduction potential
PCE.....	tetrachloroethene
RCRA.....	Resource Conservation and Recovery Act
SWMU.....	Solid Waste Management Unit
TCE.....	trichloroethene
TOC.....	total organic carbon
UST.....	underground storage tank
VC.....	vinyl chloride
VCP.....	voluntary cleanup program
VOC.....	volatile organic compound
Work Plan.....	SWMU-17 Remedial Action Work Plan

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1.0 INTRODUCTION

This document presents a 2017 annual report for the anaerobic bioremediation remedial action performed at Solid Waste Management Unit (SWMU)-17 of The Boeing Company's (Boeing) Developmental Center (DC) in Tukwila, Washington (Figure 1). The DC is a regulated facility under the Resource Conservation and Recovery Act (RCRA) with a facility identification number of WAD-09363-9946. The Washington State Department of Ecology (Ecology) is authorized by the US Environmental Protection Agency (EPA) to implement RCRA corrective action through its Model Toxics Control Act (MTCA) regulations. Boeing is performing remedial actions at the DC under Ecology's voluntary cleanup program (VCP).

Remedial action at SWMU-17 is performed to enhance reductive dechlorination of tetrachloroethene (PCE), trichloroethene (TCE), and their breakdown products present in groundwater. The primary reductive dechlorination breakdown products of PCE and TCE are cis-1,2-dichloroethene (cDCE) and vinyl chloride (VC). SWMU-17 wells and site features are shown on Figure 2. Anaerobic bioremediation remedial action was performed in general accordance with the SWMU-17 Remedial Action Work Plan (Work Plan; LAI 2011) and the Addendum No. 1, SWMU-17 Remedial Action Work Plan (Addendum; LAI 2017b).

This sixth annual report following the start of the SWMU-17 remedial action in 2011 summarizes the remedial action activities and results for calendar year 2017. Activities during this reporting period consisted of quarterly performance monitoring, data evaluation, and an electron donor treatment injection conducted in November 2017. The molasses injection was performed immediately after the November groundwater sampling event.

1.1 Background

SWMU-17 (Figure 2) comprises the general area of a former 67-gallon sump and associated 4,000-gallon steel underground storage tank (UST; designated DC 05) located west of Building 9-64. Waste oil generated by hydraulic testing shops, automotive maintenance shops, and various other operations at the DC was discharged to the sump, which flowed into the UST. Periodically, waste oil was pumped from the UST for offsite treatment and disposal (SAIC 1994). The sump and UST were installed in 1957 and removed in late March or early April 1986 (LAI 1987).

Following removal of the sump and UST, and initial phases of the investigation (LAI 2004), groundwater monitoring has focused on chlorinated volatile organic compounds (CVOCs) and selected metals (copper and arsenic). CVOCs of interest included PCE, TCE, and reductive dechlorination breakdown products cDCE and VC. Initially, preliminary screening levels (LAI 2002) were exceeded for PCE and intermittently for dissolved metals (copper only) and total metals (both copper and arsenic), with total metals concentrations historically higher than dissolved concentrations. Through May 2008, prior to bioremediation pilot testing, the highest concentrations of PCE and TCE were detected at wells BDC-05-02 and BDC-05-07 (LAI 2008). Groundwater concentrations of PCE ranged from

approximately 5 to 33 micrograms per liter ($\mu\text{g/L}$) at BDC-05-07 and BDC-05-02; TCE at these two wells ranged from 7 to 45 $\mu\text{g/L}$. Preliminary screening levels for total and dissolved copper and total arsenic were exceeded in groundwater at multiple wells. Cumulative data for these constituents are presented for SWMU-17 wells in Table 1. Proposed cleanup levels (CULs), developed for the DC in 2013 (LAI 2013b) were lower than initial screening levels, with the exception of CULs for arsenic and copper, which increased. Proposed CULs are presented for comparison to data in Table 1.

Bioremediation pilot testing, consisting of electron donor injection to enhance biological degradation of PCE and TCE, was conducted October 2008 through February 2010. Water amended with electron donor substrates, nutrients, and ferrous sulfate was injected to well BDC-05-02. Ferrous sulfate was included in the injection solution to stimulate removal of dissolved copper and arsenic from groundwater and abiotic degradation of PCE and TCE through reaction with formed iron sulfides. The resulting biodegradation substantially reduced PCE and TCE at the injected well and, with time, at the nearest downgradient well. The effectiveness of the ferrous sulfate addition was inconclusive. Details of the pilot test can be found in the Pilot Test Report (LAI 2010b) and the subsequent Response to Ecology Comments (LAI 2010a).

To further characterize the SWMU-17 plume, groundwater was sampled from 67 additional direct-push borings in 2010 and 2011, resulting in characterization of the horizontal and vertical extents of contamination (LAI 2011). Results from the deeper borings confirmed that contamination is restricted to the shallow interval. Iso-concentration contours representing SWMU-17 concentrations of PCE and/or TCE prior to full-scale treatment are presented on Figure 3. Both PCE and TCE are parent products targeted for remediation. cDCE and VC, anaerobic biodegradation end products of PCE and TCE, were also detected. Further details on plume characterization and evaluation of contaminant distribution were provided in the Work Plan (LAI 2011).

1.2 Remedial Approach

Anaerobic bioremediation at SWMU-17 is accomplished through stimulation of micro-organisms present in the aquifer to enhance biodegradation of chloroethenes. During the initial injection in August 2011, vegetable oil and ethyl lactate (electron donor substrates) were injected throughout the higher-concentration core of the plume to stimulate biotic reductive dechlorination of PCE and TCE (electron acceptors). In November 2017, molasses was injected as electron donor to selected wells for continued treatment of source area PCE and TCE concentrations in order to reduce downgradient VC concentrations. Details of the 2017 molasses injection event are discussed in Section 3.2.

Reductive dechlorination of PCE and TCE occurs through microbially mediated (biotic) reactions whereby micro-organisms obtain energy through oxidation-reduction (redox) reactions. Electron donors (hydrogen, fatty acids, etc.) are used by microbes together with various electron acceptors (oxygen, nitrate, manganese [IV], ferric iron, sulfate, and carbon dioxide [CO_2]). These redox reactions can be compared to the process of humans obtaining energy through consumption of food (electron

donor) and oxygen (electron acceptor). Bacteria obtain the greatest energy yield by using oxygen as an acceptor, as it is highly oxidized and, therefore, can be reduced easily and to a large degree. When oxygen is depleted in an uncontaminated aquifer, bacteria sequentially use the less oxidized electron acceptors in the following order: nitrate; manganese (IV); iron (III) (i.e., ferric iron); sulfate; and CO₂.

Chloroethenes can also be used as electron acceptors by specific micro-organisms and degraded to harmless end products. Through biodegradation, chloride ions present on the chlorinated hydrocarbon molecule are replaced with hydrogen (electron donor), resulting in the formation of successively less chlorinated molecules. By this process, PCE and TCE are degraded to less chlorinated breakdown products, cDCE and VC, and then to innocuous end products ethene and ethane. PCE is the most oxidized electron acceptor in typical groundwater systems after oxygen and, therefore, can be reduced as soon as oxygen is depleted (Vogel et al. 1987a). TCE, cDCE, and VC, however, require successively more reducing aquifer conditions for degradation. TCE can be degraded under iron-reducing conditions (Chapelle 1996); cDCE can be degraded under sulfate-reducing to CO₂-reducing (i.e., methanogenic) conditions (Chapelle 1996, Vogel et al. 1987b); and VC can be degraded only under highly reducing methanogenic conditions (Ballapragada et al. 1997, Freedman and Gossett 1989, Maymo-Gatell et al. 1995, Vogel and McCarthy 1985).

Reductive dechlorination is enhanced through the injection of electron donor substrates (e.g., vegetable oil and lactate) as a food source for the bacteria. Electron donor substrates are injected into the contaminated aquifer where a consortium of indigenous bacteria first ferment the substrate to volatile fatty acids and hydrogen and then use these fermentation products as electron donor for reduction of natural electron acceptors and chloroethenes. Depletion of natural electron acceptors (e.g., oxygen, iron, sulfate, CO₂) creates the highly reducing aquifer conditions (sulfate-reducing to methanogenic conditions) required for complete reductive dechlorination of PCE and breakdown products. Hydrogen is the required electron donor for the primary cDCE and VC degraders (i.e., dehalococcoides [DHC] strains¹) that degrade these PCE breakdown products to harmless, non-chlorinated end products. Other anaerobic dechlorinating organisms are typically common and widespread, and utilize fatty acids or hydrogen as the electron donor.

1.3 Data Evaluation Considerations

Evaluation of results requires consideration of whether data is from injection wells (IWs) or monitoring wells (MWs). These well types are identified under each well ID in Table 1 and are identified by different symbols on report figures. Characteristics of these two groups of wells are as follows:

- IWs: Injection wells utilized for the initial injection in 2011 were generally located within the high-concentration core of the PCE/TCE plume. Due to higher initial concentrations of PCE and TCE, biodegradation to breakdown products and end products is most apparent. Because

¹ Recent, and as yet unpublished, work from Dr. Frank Loeffler of the University of Tennessee indicates that some bacteria of the Dehalogenimonas genus may also mediate this degradation step (<https://attendee.gotowebinar.com/recording/3849949141293136642>).

these wells were used for injection, TOC concentrations (indicative of electron donor) are likely to be higher and persist for longer than at nearby MWs. Similarly, enhanced aquifer redox conditions are likely to develop sooner and persist for longer than in the rest of the aquifer. The five injection wells utilized for the 2017 injection were located at the eastern end of plume to target the area where PCE/TCE had not been completely treated. Three of the five 2017 injection wells (BDC-05-02, BDC-05-07, BDC-05-10) were also injected in 2011, while two (BDC-05-03 and BDC-05-04) were monitoring wells from 2011 until injected in 2017.

- MWs: Groundwater data from MWs provide insight to the downgradient and crossgradient extent of treatment effects, including distribution of total organic carbon (TOC), enhanced redox conditions, and dechlorination breakdown products and end products. An understanding of the MW locations relative to the plume and to IWs is also important for evaluation of the data, as follows:
 - MW BDC-05-19 is within the core of the contaminant plume. Similar to the IWs, higher initial concentrations of PCE and TCE make biodegradation to breakdown products and end products more apparent at this well.
 - Other MWs are at the fringes of the plume, both downgradient (BDC-05-20) and crossgradient (BDC-05-03, BDC-05-04, BDC-05-08, BDC-05-18, BDC-05-21, BDC-05-22, and BDC-05-24), and an additional well is far downgradient (BDC-05-23). Concentration and treatment trends apparent at wells located within the higher-concentration core of the plume may not be readily apparent at wells at the fringes of the plume due to lower initial concentrations of PCE and TCE at fringe wells. Some of these wells have shown post-injection increases in TOC concentrations and/or changes in redox conditions, indicating the extent of treatment effects.
 - An additional MW is located upgradient of the plume (BDC-05-05). This well is sampled for continued evaluation of background conditions and is unaffected by bioremediation.

2.0 SUMMARY OF PRIOR WORK

This section briefly summarizes remedial action activities that took place during the previous reporting periods (June 2011 through December 2016), as documented in previous reports (LAI 2013a, 2014, 2016a, b, 2017a). Field activities and data findings are summarized below.

2.1 Prior Field Activities

Prior field activities consisted of installation of IWs and MWs, electron donor injection, and groundwater monitoring.

Sixteen additional groundwater wells (BDC-05-09 through BDC-05-24) were installed July 5–11, 2011. This supplemented six existing wells (BDC-05-02 through BDC-05-05, BDC-05-07, and BDC-05-08) for a total of 22 SWMU-17 wells utilized for the remedial action. Well locations are presented on Figure 2.

An electron donor solution was injected into 11 wells August 15–18, 2011. Each of the 11 wells (BDC-05-02, BDC-05-07, and BDC-05-09 through BDC-05-17) was injected with approximately 5,600 gallons of donor injection fluid, consisting of approximately 5,300 gallons of potable water from an onsite hydrant, 320 gallons of LactOil™ donor substrate, and 2 pounds (lbs) of yeast extract. A total of 66,800 gallons was injected. LactOil is a combination donor substrate containing both soluble (fast-release) ethyl lactate and insoluble (slow-release) soybean oil.

Baseline sampling was performed in July 2011, followed by quarterly (10 wells) and semiannual (22 wells) post-injection sampling. Samples were analyzed for target contaminants and breakdown products (PCE, TCE, cDCE, and VC); non-toxic end products (ethene and ethane); parameters indicative of aquifer redox conditions (dissolved oxygen [DO], oxidation-reduction potential [ORP], nitrate, ferrous iron, sulfate, and methane); TOC and pH indicative of electron donor; and total and dissolved copper and arsenic. In accordance with the Work Plan, laboratory analysis of methane/ethane/ethene/acetylene (MEEA) was performed at select wells. Nitrate, which was consistently not detected, was determined to not be useful for evaluation of aquifer redox conditions at the site, and nitrate analysis was discontinued beginning in May 2012. MEEA was added to additional wells BDC-05-03, BDC-05-21, and BDC-05-24 beginning with the May 2013 semiannual sampling event to improve evaluation of treatment progress.

2.2 Summary of Prior Findings

This section briefly summarizes findings prior to 2017 to provide context for discussion of results from the current reporting period (Section 4.0). Findings through November 2016 demonstrated substantial treatment in the first 63 months following the first donor injection.

Baseline data showed conditions conducive to limited biodegradation of PCE and TCE. The highest baseline concentrations of PCE and TCE were 39 µg/L (BDC-05-10) and 28 µg/L (BDC-05-15), respectively. cDCE, the first reductive dechlorination sequential breakdown product, was commonly

detected (ranged from 0.2 to 45 µg/L), but VC and end products ethene and ethane were below reporting limits. Baseline aquifer redox conditions were variable, with more highly reducing conditions (sulfate-reducing to methanogenic) occurring at source zone wells BDC-05-02 and BDC-05-07 due to prior pilot testing, and predominantly mild to moderately reducing conditions (nitrate to iron-reducing) occurring elsewhere in the plume. TOC concentrations were below 10 milligrams per liter (mg/L) at most wells, which is the threshold generally considered to represent sufficient electron donor to support substantial reductive dechlorination (Major et al. 2003).

Post-injection monitoring results through November 2016 indicated that bioremediation had been substantially enhanced due to electron donor injection. Monitoring data provided “direct evidence” of biodegradation, at 16 of 22 monitored wells, which consisted of elevated TOC, more highly reduced aquifer redox conditions, and changes in concentrations of PCE, TCE, or breakdown products. Continued production of ethene and ethane indicated complete reductive dechlorination through to non-toxic end products.

A summary of more specific, pre-2017 findings is as follows:

- **TOC:** Through electron donor injection, TOC concentrations were enhanced for bioremediation throughout the core of the contaminant plume and many of the crossgradient and downgradient monitoring wells. TOC at IWs ranged from 550 to 5,360 mg/L during the November 2011 sampling event conducted 2.5 months after the donor injection. As of November 2016 (63 months post-injection), TOC had decreased substantially at all IWs (ranging from 5.2 to 22.5 mg/L), was near baseline concentrations at the five eastern IWs near the head of the plume (BDC-05-02, BDC-05-07, BDC-05-09, BDC-05-10, BDC-05-11), and remained greater than 10 mg/L (11 to 23 mg/L) at six western IWs (BDC-05-12 through BDC-05-17). A TOC concentration of 10 mg/L or more is generally considered to represent sufficient electron donor to support substantial reductive dechlorination (Major et al. 2003).
- **Redox Conditions:** Highly reducing aquifer redox conditions required for complete reductive dechlorination of PCE, TCE, and breakdown products occurred throughout the core of the plume as a result of the initial electron donor injection. The generally low concentrations of sulfate and elevated concentrations of methane in all IWs through November 2016 were indicative of continued highly reduced redox conditions.
- **Reductive Dechlorination:** Following initial injection in 2011, reductive dechlorination was enhanced at all SWMU-17 wells with the exception of upgradient well BDC-05-05. Concentrations of PCE and TCE at BDC-05-10, which had the highest baseline concentration of PCE and the second highest concentration of TCE, had remained less than the reporting limit (0.2 µg/L) from May 2012, representing a concentration reduction of more than 99 percent. Increases in one or more breakdown products (cDCE and VC) or end products (ethene and ethane) were observed at all IWs. After peaking, cDCE concentrations decreased and remained below proposed CULs since November 2012. As of November 2016, PCE remained below the proposed CUL (5.3 µg/L) at all wells, and TCE was at or below the proposed CUL (1.4 µg/L) at all but three wells (BDC-05-02, BDC-05-05, and BDC-05-18). As of November 2016, VC concentrations were below the proposed CUL at all wells for the first time since treatment began. Complete reductive dechlorination was evidenced by innocuous end products ethane and ethane detected at 15 of the 17 wells where analyzed in 2016 (neither were detected at

BDC-05-03 or BDC-05-18). Evaluation of results on a molar basis indicated a steady shift from a predominance of chlorinated ethenes (PCE, TCE, cDCE, and VC) to non-chlorinated end products (ethene and/or ethane) at all wells with significant baseline PCE and TCE concentrations.

- Arsenic and Copper: Concentrations of arsenic and copper increased at many SWMU-17 wells following the August 2011 injection, consistent with results observed during bioremediation pilot testing. As of November 2016, total and dissolved copper concentrations were below the CUL (0.008 mg/L) at all wells; total and dissolved arsenic concentrations remained above the proposed CUL (0.008 mg/L) at 13 of 21 sampled wells, a decrease compared to 16 wells above the CUL in October 2015. Solubilization of reduced arsenic (along with manganese and iron) is a localized and temporary phenomenon that occurs within the portion of the aquifer that has been artificially reduced through donor amendment. Once the injected donor has been consumed and natural redox conditions are re-established, these metals should return to the less soluble forms that existed prior to donor amendment (Solutions-EIS 2006, Suthersan et al. 2003).

3.0 2017 ACTIVITIES AND RESULTS

Activities in 2017 consisted of quarterly and semiannual performance monitoring and an electron donor substrate injection.

3.1 Quarterly and Semiannual Performance Monitoring

Quarterly monitoring was performed at 10 wells, including three representative IWs (BDC-05-02, BDC-05-12, and BDC-05-16); three MWs located near the core of the plume (BDC-05-18 through BDC-05-20); and four downgradient and crossgradient monitoring wells (BDC-05-21 through BDC-05-24). Semiannual sampling was performed at all 22 wells, and included measurement of groundwater elevations.

As indicated in the Table 2 monitoring matrix, samples were analyzed for target contaminants and breakdown products (PCE, TCE, cDCE, and VC); non-toxic end products (ethene and ethane); parameters indicative of aquifer redox conditions (DO, ORP, ferrous iron, sulfate, and methane); and TOC and pH indicative of electron donor. In accordance with the Work Plan, laboratory analysis of MEEA was performed at select wells. In addition, metals analysis for total and dissolved copper and arsenic was performed during quarterly and semiannual monitoring. Laboratory analysis was performed by Eurofins Lancaster Laboratories Environmental. Parameters DO, ORP, ferrous iron, and pH were measured in the field. Groundwater monitoring data are presented in Table 1. Laboratory reports for the reporting period are presented in Appendix A.

Groundwater elevations were measured during the May and November 2017 semiannual sampling events. Consistent with previous data, elevations show generally west-southwesterly groundwater flow, with localized northerly and southerly components of flow near the head to middle portion of the plume. These groundwater flow directions are consistent with the southwest-trending contaminant plume. Groundwater elevation contours for May and November 2017 are presented on Figures 4 and 5. Cumulative groundwater elevation data for SWMU-17 wells are presented in Appendix B.

3.2 Molasses Injection

Following the November 2017 semiannual monitoring event, molasses was injected as an electron donor into five wells (BDC-05-02, BDC-05-03, BDC-05-04, BDC-05-07, and BDC-05-10) within the source area to address PCE and/or TCE concentrations that were greater than 1 µg/L. While the proposed CULs for PCE and TCE at the site are greater than 1 µg/L, Boeing's goal is to adopt DC CULs that are consistent with final CULs for other Duwamish sites, which have not yet been determined. It is expected that final CULs may be changed from the proposed CULs (LAI 2017b). Injection substrates and procedures are described below. Table 3 provides a summary of injection volumes and rates for each well.

Approximately 37,240 lbs of molasses (79 percent solids) was delivered heated (105 degrees Fahrenheit) to the site via tanker truck. The molasses was stored in a 4,000-gallon polyethylene tank wrapped with insulating blankets. The molasses was delivered heated in order to lower viscosity for transfer and mixing under cold weather conditions during injection.

Five batches of donor solution were mixed in a 6,500 gallon polyethylene tank. Each batch contained an average of 637 gallons (7,448 lbs) of molasses, 11.5 lbs of yeast extract, and 5,546 gallons of tap water. The tap water was provided by an onsite hydrant and was dechlorinated prior to mixing with sodium thiosulfate.

Prior to injecting the molasses donor solution, each well was injected with approximately 33 gallons ferrous chloride (FeCl_2) solution, followed by 100 gallons of dechlorinated tap water. The purpose of injecting the FeCl_2 solution was to provide a source of ferrous iron to complex the sulfate present in the molasses. Sulfide, resulting from biological reduction of sulfate, complexes with ferrous iron to form iron sulfide precipitates within the aquifer matrix. Abiotic destruction occurs through chemical reaction between these iron sulfides and PCE, TCE, and cDCE, which are degraded to non-toxic intermediaries dichloroacetylene, chloroacetylene, and acetylene without formation of VC. This abiotic destruction mechanism is complimentary and occurs concurrently with biological (i.e., biotic) reductive dechlorination of TCE (LAI 2017b).

Mixed batches of the molasses donor solution were injected in up to three wells at a time in accordance with the procedure outlined in the Addendum (LAI 2017b). A 25- or 50-micron filter was found to be most efficient in maintaining desired injection rates while preventing solids from entering the injection wells.

Total injection volumes per well ranged from a low of 5,624 gallons at BDC-05-04 to high of 6,462 gallons at BDC-05-05-02, with average injection rates of 15 gallons per minute (gpm) at BDC-05-02 to 26 gpm at BDC-05-07. Cumulative injection rates up of to 122 gpm were achieved as a result of simultaneous injection of three wells (BDC-05-02, BDC-05-03, and BDC-05-10). Immediately following the donor injection, each well was flushed with an average of 420 gallons of dechlorinated tap water (Table 3).

4.0 DISCUSSION OF 2017 RESULTS

This section presents discussion and interpretation of data collected during 2017. As of the November 2017 sampling event, all wells were below proposed CULs for PCE, cDCE, and VC, while two of the 22 wells were above the CUL for TCE.² Groundwater monitoring results show that *in situ* anaerobic bioremediation continues to be enhanced, despite declining TOC concentrations. Results indicate enhanced aquifer redox conditions and enhanced reductive dechlorination. Complete reductive dechlorination is occurring, as indicated by detection of end products ethene and/or ethane, at the majority of IWs and MWs where analyzed. With a single exception (BDC-05-18), ethene+ethane was predominant at all wells where analyzed in November 2017. Predominance of these innocuous end products (i.e., there is more ethene+ethane on a molar basis than PCE, TCE, cDCE, or VC), demonstrates conversion of the toxic parent and breakdown products to non-toxic end products as a result of bioremediation. November 2017 data were collected 75 months following the August 2011 electron donor injection.

Monitoring results, including volatile organic compound (VOC) molar fractions, are summarized in a cumulative data table (Table 1), presented on various figures and appendices, and discussed further in the following sections. Figures 6 through 14 show VOC concentrations over time at representative wells: BDC-05-02 and BDC-05-07 (source zone IWs); BDC-05-9, BDC-05-10 and BDC-05-16 (plume IWs); BDC-05-19 (MW between IWs in the core of the plume); BDC-05-20 and BDC-05-21 (MWs at downgradient edge of the plume); and BDC-05-23 (far downgradient MW). Time plots for molar concentrations of VOCs and breakdown products for the representative wells are presented in Appendix C. Time plots of redox parameters (methane and sulfate) and TOC for representative wells are presented in Appendix D.

4.1 Treatment Condition Categories

As described in previous reports (LAI 2013a, 2014, 2016a, b, 2017a), SWMU-17 wells can be separated into three categories based on evidence of enhanced conditions for bioremediation. Wells are divided into these categories based on post injection data through November 2017, as described below and as shown on Figure 15.

1. **Direct Evidence:** Fifteen wells show “direct evidence” of enhanced bioremediation. In order for a well to be classified as showing “direct evidence,” each enhanced bioremediation indicator must have been demonstrated at the well for a sustained period of time after the injection. These indicators consist of: 1) TOC above baseline, 2) reduced aquifer redox conditions, and 3) changed concentrations of PCE, TCE, cDCE, VC, and/or ethene/ethane. The wells that meet these criteria consist of:
 - All 11 IWs: BDC-05-02, BDC-05-07, BDC-05-09 through BDC-05-17

² Wells BDC-05-02 and BDCE-05-18. Both were targeted by the November 2017 injection event.

- Four MWs:
 - BDC-05-08 (25 ft crossgradient of IWs BDC-05-12 and BDC-05-13)
 - BDC-05-19 (10 feet [ft] downgradient of IW BDC-05-12)
 - BDC-05-20 (31 ft downgradient of IW BDC-05-17)
 - BDC-05-21 (30 ft crossgradient of IW BDC-05-17)
2. **Some Evidence:** Six wells show “some evidence” of enhanced bioremediation. Evidence at these wells consists primarily of changes in VOC concentrations without substantial or sustained changes in TOC compared to baseline; sustained aquifer redox changes have been apparent at some of these wells. The wells in this category are considered to be on the fringes of the biotreatment area with VOC concentration reduction resulting from upgradient or nearby treatment. VOCs were below proposed CULs for the entire reporting period at BDC-05-03, BDC-05-04, BDC-05-08, BDC-05-22 and BDC-05-23. TCE has previously exceeded the proposed CUL at all of following wells, except BDC-05-04.
- BDC-05-03 (17 ft downgradient of IW BDC-05-11)
 - BDC-05-04 (22 ft crossgradient of IW BDC-05-07)
 - BDC-05-18 (12 ft crossgradient of IW BDC-05-10)
 - BDC-05-22 (48 ft crossgradient of IW BDC-05-17)
 - BDC-05-23 (170 ft downgradient of nearest IW)
 - BDC-05-24 (18 ft crossgradient of IW BDC-05-14).
3. **No Evidence:** The only well to show no evidence of enhanced bioremediation is upgradient MW BDC-05-05, which is not expected to be affected by donor injection.

Based on this categorization of monitoring results, there is “direct evidence” that bioremediation has been substantially enhanced at IWs and at MWs located up to 30 ft downgradient (e.g., BDC-05-21) and 25 ft crossgradient (e.g., BDC-05-08) of any IW. “Some evidence” of bioremediation occurs at all remaining wells with the exception of the upgradient MW BDC-05-05. The data demonstrates enhanced bioremediation has been sustained from the 2011 injection through 2017.

4.2 TOC and Redox Conditions

Monitoring results indicate aquifer TOC and/or redox conditions have been enhanced throughout the core of the contaminant plume and at many of the crossgradient and downgradient monitoring wells following the August 2011 injection. These results indicate conditions conducive to continued enhanced bioremediation of PCE/TCE and breakdown products. Due to the August 2011 injection, TOC increased from low baseline levels (<10 mg/L) at all IWs to a range of 550 to 5,360 mg/L.

As of November 2017, TOC has declined to near baseline at the five eastern IWs near the head of the plume (BDC-05-04, BDC-05-09, BDC-05-10, BDC-05-11, BDC-05-12), while it remains greater than 10 mg/L (11 to 33 mg/L) at BDC-05-02, BDC-05-07, and the five western IWs (BDC-05-13 through BDC-05-17). A TOC concentration of 10 mg/L or more is generally considered to represent sufficient

electron donor to support substantial reductive dechlorination (Major et al. 2003). Lower levels of TOC may support an extended period of residual treatment.

Highly reducing conditions required for reductive dechlorination persist throughout the core of the plume, as indicated by generally low concentrations of sulfate and elevated concentrations of methane in all IWs through November 2017. Highly reducing conditions have also been achieved at all monitoring wells showing “direct evidence” of enhanced bioremediation (BDC-05-19, BDC-05-20, and BDC-05-21) (Section 4.1). Highly reducing conditions also occur at seven wells showing “some evidence” (BDC-05-03, BDC-05-04, BDC-05-08, BDC-05-18, BDC-05-22, BDC-05-23, and BDC-05-24) of enhanced bioremediation; enhanced redox is indicated by decreases in sulfate and/or increases in methane. At other downgradient and crossgradient MWs, redox changes have been minor (e.g., decreased DO or increased ferrous iron) or short-lived (e.g., a brief decrease in sulfate followed by a rebound to baseline levels).

4.3 Reductive Dechlorination of VOCs

Enhanced reductive dechlorination following the August 2011 donor injection has resulted in substantially decreased PCE/TCE concentrations, conversion to intermediary breakdown products cDCE and VC, and conversion to end products ethene and ethane. Reductive dechlorination has resulted in concentration reduction at all SWMU-17 wells with the exception of upgradient well BDC-05-05, which is outside the treatment area.

During 2017, PCE remained below the proposed CUL (5.3 µg/L) at all wells, and TCE was at or below the proposed CUL (1.4 µg/L) at all but two wells (BDC-05-02 and BDC-05-18). At BDC-05-02, TCE was slightly elevated above the proposed CUL during all four monitoring events and ranged from 1.6 µg/L (February) to 3.6 µg/L (November). At BDC-05-18, TCE increased to above the proposed CUL in 2016 and ranged from 1.7 to 4.6 µg/L in 2017. Both of the wells exceeding the proposed TCE CUL were targeted by the November 2017 donor injection. In November 2016, TCE was detected above the proposed CUL for the first time at BDC-05-05 (1.5 µg/L), but the May and November 2017 results indicate TCE has decreased back down to below the CUL.

At well BDC-05-10, which had the highest baseline concentration of PCE and the second highest TCE concentration, PCE and TCE have remained persistently less than the reporting limit from May 2012 through 2017; this represents a concentration reduction of greater than 99 percent. November 2017 PCE/TCE concentrations in groundwater are presented on Figure 16 for comparison to baseline PCE/TCE iso-concentration contours on Figure 3.

Reductive dechlorination has resulted in temporary increases in breakdown products cDCE and VC. After reaching a maximum concentration of 250 µg/L at well BDC-05-09 in May 2012, cDCE concentrations have remained below the proposed CUL (134 µg/L) at all wells since November 2012. The maximum cDCE detection in 2017 (9.4 µg/L at crossgradient well BDC-05-22 in May) was well below the proposed CUL. IW BDC-05-09 was the only well with a VC concentration above the CUL for

the 2017 monitoring year (1.2 and 2.8 µg/L in November and May, respectively); ethene and ethane were also detected and predominant at this well. November VC concentrations in groundwater are presented on Figure 17.

Complete reductive dechlorination is evidenced by widespread occurrence of innocuous end products ethene and ethane. One or both of these compounds were detected at 16 of the 18 wells where analyzed in 2017. Neither was detected at BDC-05-04 or BDC-05-18.

The progress of dechlorination is also evaluated based on the prevalence of parent products, breakdown products, and end products. Reductive dechlorination progresses sequentially from parent products PCE and TCE, to breakdown products cDCE and VC, to non-toxic end products ethene and ethane. This is because bacteria prefer to degrade the parent and breakdown products in the following sequence:



Bacteria gain more energy from reduction of the more chlorinated (i.e., more oxidized) compounds. As a result of this sequential degradation, the concentrations of parent, breakdown, and end products each peak sequentially as treatment progresses.

Figure 18 presents the percentage (average molar fraction) of total ethenes contributed by PCE, TCE, cDCE, VC, and ethene+ethane over time for all 17 of SWMU-17 wells where ethene and ethane are analyzed; the shift from parent product and breakdown product predominance to predominance of non-toxic ethene+ethane is readily apparent. Ethene/ethane predominance means that ethene+ethane constitutes a higher percentage of total ethenes (i.e., CVOCs + end products) than do each of the chlorinated ethenes (PCE, TCE, cDCE, or VC). Ethene+ethane represented just 1.7 percent of the total ethenes (i.e., 1.7 percent molar fraction) during baseline sampling in July 2011. Due to biodegradation stimulated by the 2011 injection, the ethene+ethane molar fraction increased to a maximum level of 91.5 percent in November 2016; the ethene+ethane molar fraction for November.

The succession of chlorinated ethene conversion to innocuous end products results in a decrease in total chlorinated ethenes concentrations (micromoles per liter [µmoles/L]) over time. Total chlorinated ethenes is the molar sum of PCE + TCE + cDCE + VC. A decrease in the concentration of total chlorinated ethenes demonstrates mass destruction, not just conversion to a less-chlorinated breakdown product (e.g., TCE to VC). Initial periods of increased total chlorinated ethenes commonly indicate enhanced desorption of contaminant mass that was partitioned to the aquifer soil matrix and liberated by surfactant properties of the injected donor solution and by biosurfactants released by stimulated bacteria. Decreasing concentrations of total chlorinated ethenes reflects the final conversion step from VC to non-chlorinated end products ethene and ethane. Total chlorinated ethenes are tabulated in Table 1 and are shown on time plots for representative wells in Appendix C. Figure 18 presents a time plot of average total chlorinated ethenes for all SWMU-17 wells. It can be seen on Figure 18 that average total chlorinated ethenes increased through May 2012 due to

enhanced desorption, then decreased substantially through 2017. Average total chlorinated ethenes through November 2017 show a substantial reduction (approximately 94 percent) compared to baseline and a 96 percent reduction compared to the May 2012 peak.

In summary, data show that PCE and its associated breakdown products are being effectively converted to non-toxic end products by bioremediation. Comparison of current contaminant concentrations to proposed CULs, indicates that treatment is in its final stages. As of November 2017, PCE, cDCE, and VC concentrations were below proposed CULs at all 22 wells, and TCE was above the proposed CUL at just 2 of the 22 wells. Detection of ethene and/or ethane at 16 of the 18 wells where analyzed in 2017 and widespread ethene+ethane predominance confirms continued complete reductive dechlorination to these non-toxic end products.

4.4 Copper and Arsenic

Concentrations of copper and arsenic increased at many SWMU-17 wells following the August 2011 injection. Copper has decreased at most wells while arsenic remains above the proposed CUL (Section 2.2). These results are consistent with observations during bioremediation pilot testing. Time plots for total copper and arsenic are presented for injection wells and monitoring wells in Appendix E. In November 2017, total and dissolved copper concentrations were below the proposed CULs at all wells.

As of November 2017, total and dissolved arsenic concentrations remained above the proposed CUL of 0.008 mg/L at 16 of 22 sampled wells, compared to 13 of 21 wells above the CUL in November 2016. Concentrations at these 16 wells have been consistently above the proposed CUL since injection, except BDC-05-04 which, until November 2017, had been below the CUL since May 2014. The highest November 2017 concentration was a total arsenic result of 0.112 mg/L at well BDC-05-18. Reducing conditions may cause mobilization of naturally occurring arsenic (along with manganese and iron) as a localized and temporary phenomenon within the portion of the aquifer that has been artificially reduced through donor amendment. Once the injected donor has been consumed and natural conditions are re-established, these metals should precipitate as the less soluble forms that existed prior to donor amendment (Solutions-EIS 2006, Suthersan et al. 2003). However, because of elevated natural background concentrations of arsenic commonly observed within in the Duwamish area due to naturally reduced aquifer conditions, arsenic concentrations may not achieve the CUL at project completion.

5.0 PLANNED ACTIONS AND SCHEDULE

Planned actions for 2018 consist of semiannual (April and November) monitoring events. The reduction in monitoring frequency from quarterly to semiannual reflects the substantial progress made in the treatment of PCE, TCE, and breakdown products. Monitoring will be as indicated in the Table 4 monitoring matrix. Monitoring results will be used to evaluate ongoing treatment and enhancements resulting from the November 2017 molasses injection.

6.0 USE OF THIS REPORT

This annual evaluation report has been prepared for the exclusive use of The Boeing Company for specific application to the Boeing Developmental Center. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

7.0 REFERENCES

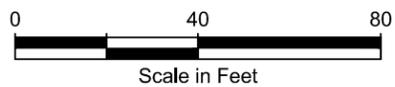
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Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Boeing Developmental Center
Tukwila, Washington

SWMU-17 Site Plan

Figure
2

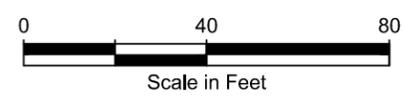
LANDAU ASSOCIATES, INC. | G:\Projects\025093\117\021BDC SWMU-17 2017 Annual\F03 PCE-TCE Preceding.dwg (A) *Figure 3* 3/8/2018



- Legend**
- Monitoring Well
 - August 2011 Injection Well
 - November 2017 Injection Well
 - Abandoned Monitoring Well
 - Catch Basin
 - ⊙ Manhole
 - SS — Sanitary Sewer Utility
 - SD — Storm Drain Utility
 - E — Electrical Utility
 - V — Water Utility
 - X — Existing Fence
 - 20 — Iso-Concentration Contours for PCE and/or TCE (µg/L) (Based on Monitoring Well and Direct-Push Sample Results)
 - ▨ SWMU-17 Solid Waste Management Unit

Note

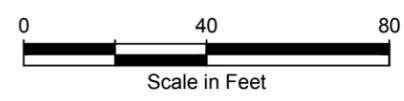
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.





Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Contours are also based on additional wells to the south, not visible on this figure.



Boeing Developmental Center Tukwila, Washington	Groundwater Elevations May 2017	Figure 4
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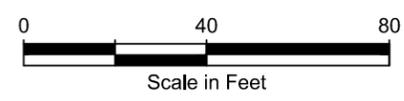


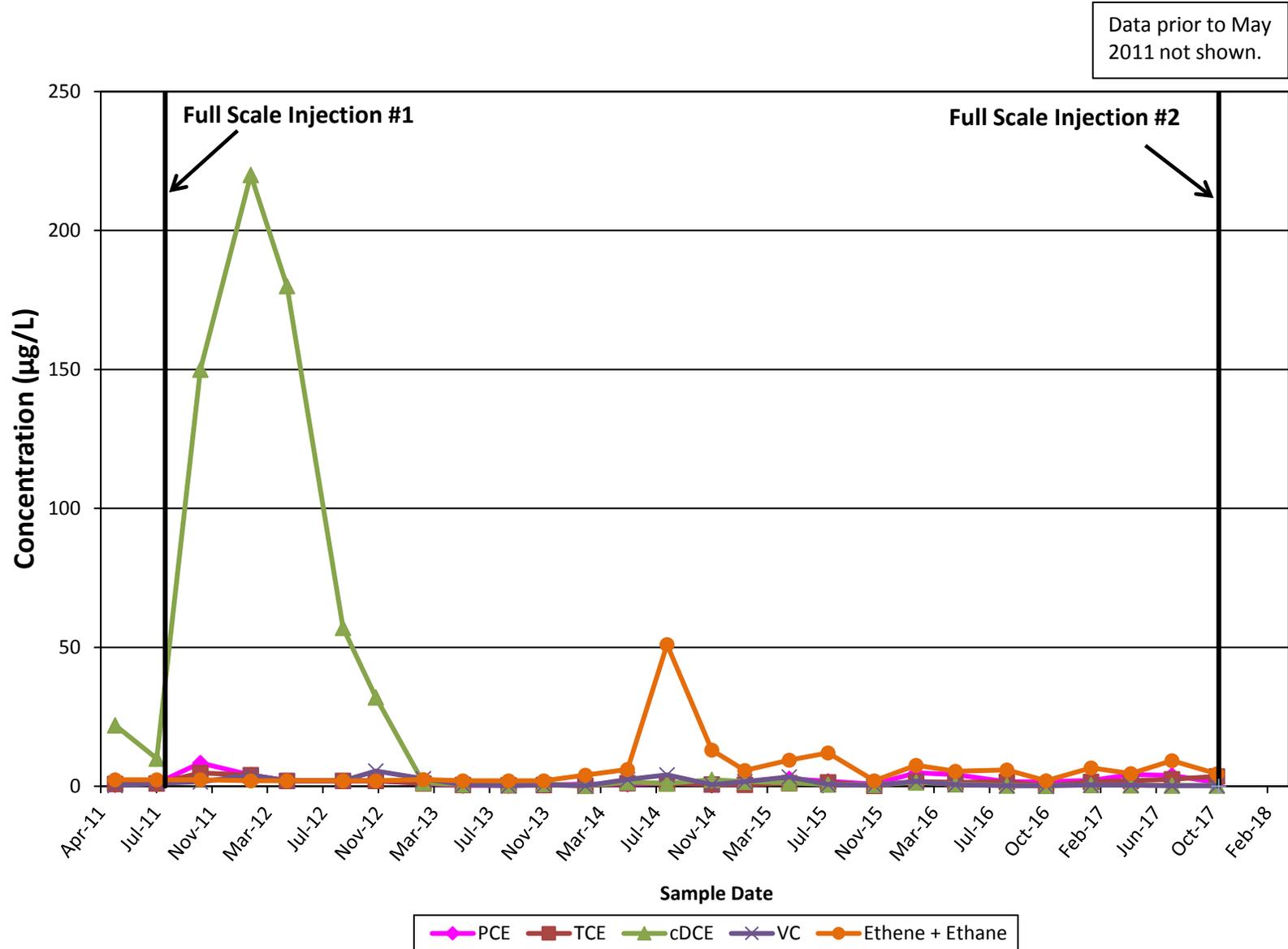
Legend

- BDC-05-22 (2.57) — Well Designation
- Groundwater Elevation (NGVD29)
- Monitoring Well
- August 2011 Injection Well
- November 2017 Injection Well
- Abandoned Monitoring Well
- Catch Basin
- ⊙ Manhole
- SS — Sanitary Sewer Utility
- SD — Storm Drain Utility
- E — Electrical Utility
- W — Water Utility
- X — Existing Fence
- 2.5 — Groundwater Elevation Contour
- [SWMU-17] Solid Waste Management Unit

Notes

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.
2. Contours are also based on additional wells to the south, not visible on this figure.

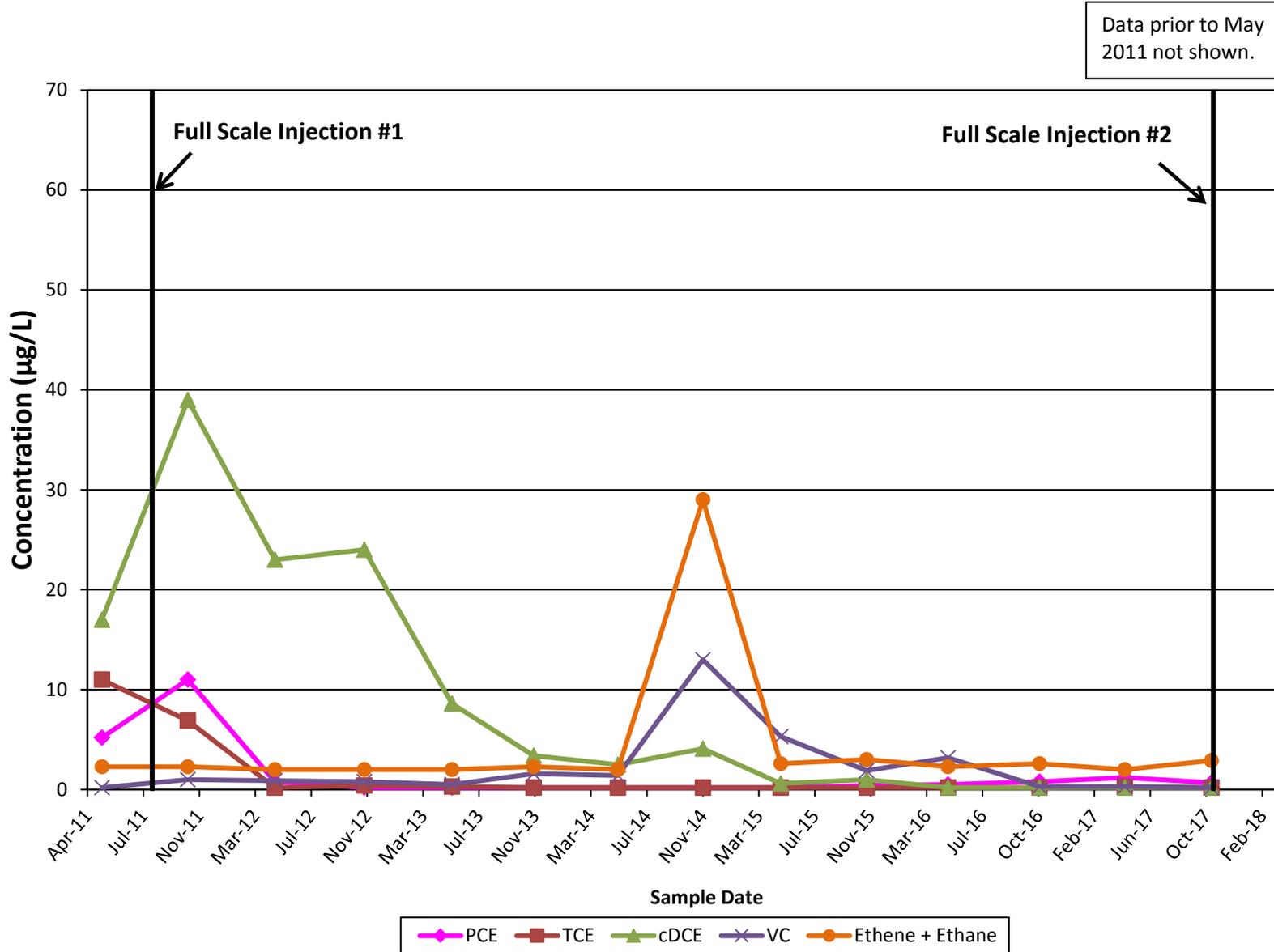




Boeing Developmental Center
Tukwila, Washington

Source Zone Injection Well
BDC-05-02 VOCs

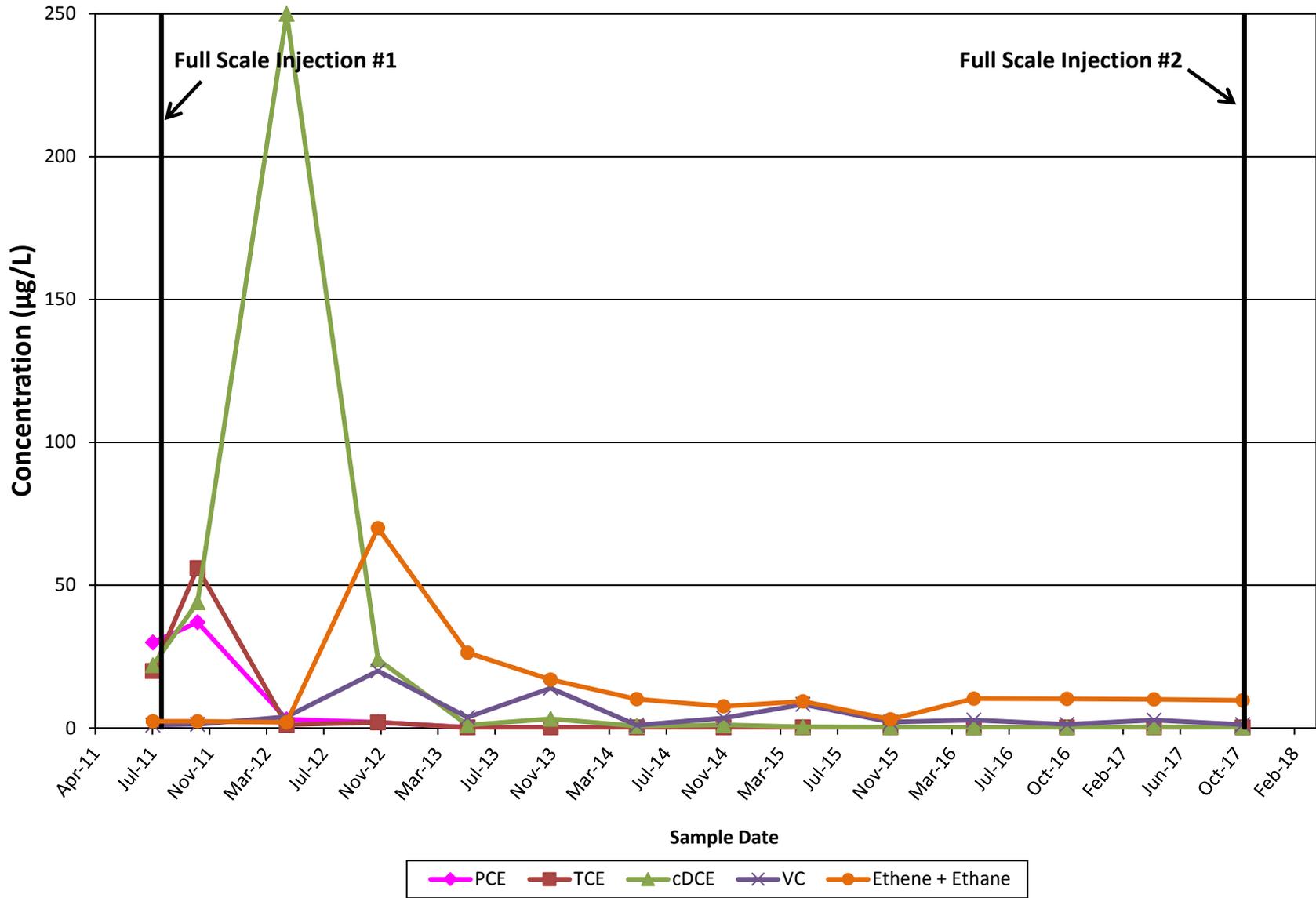
Figure
6



Boeing Developmental Center
Tukwila, Washington

Source Zone Injection Well
BDC-05-07 VOCs

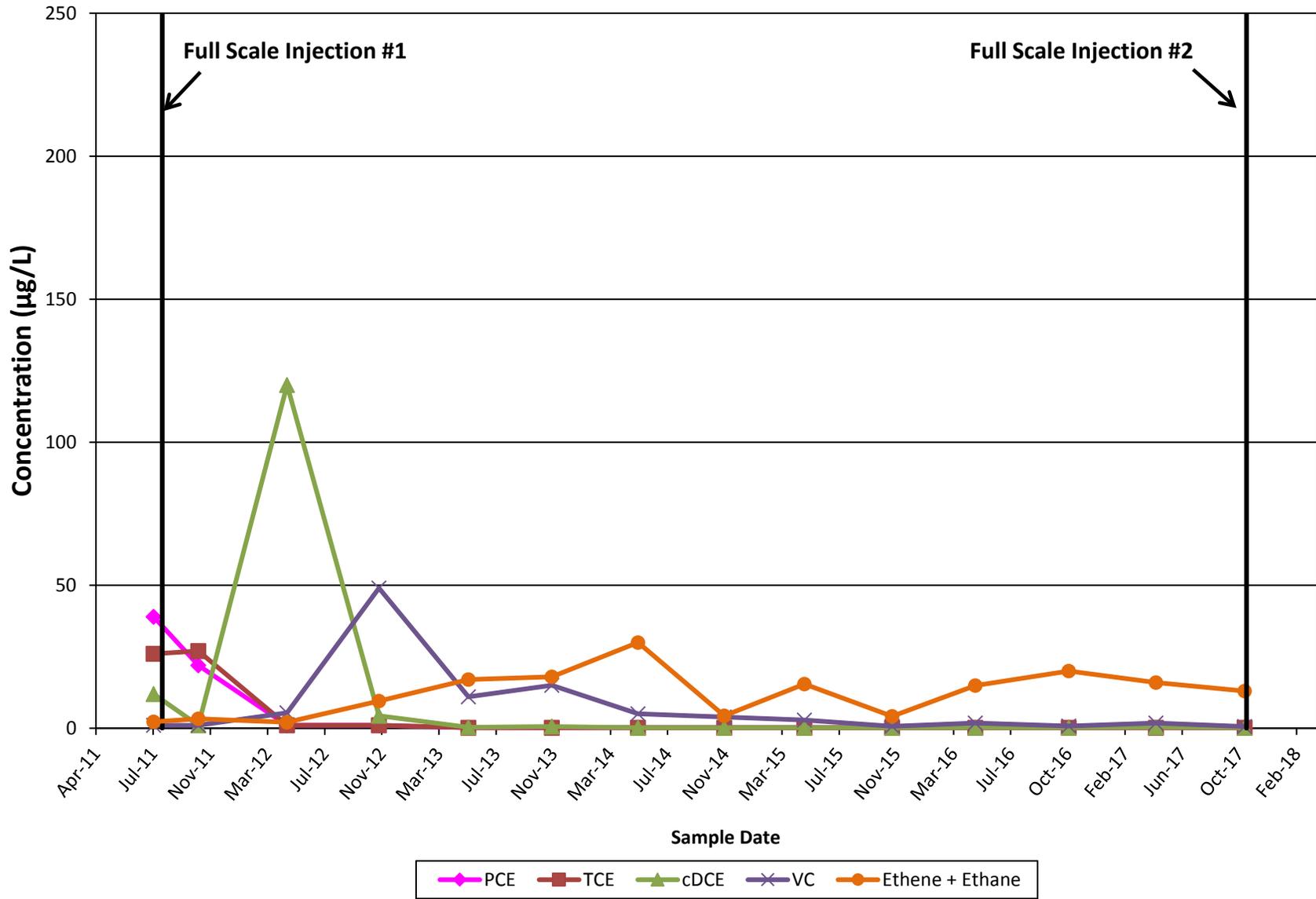
Figure
7



Boeing Developmental Center
Tukwila, Washington

Plume Injection Well
BDC-05-09 VOCs

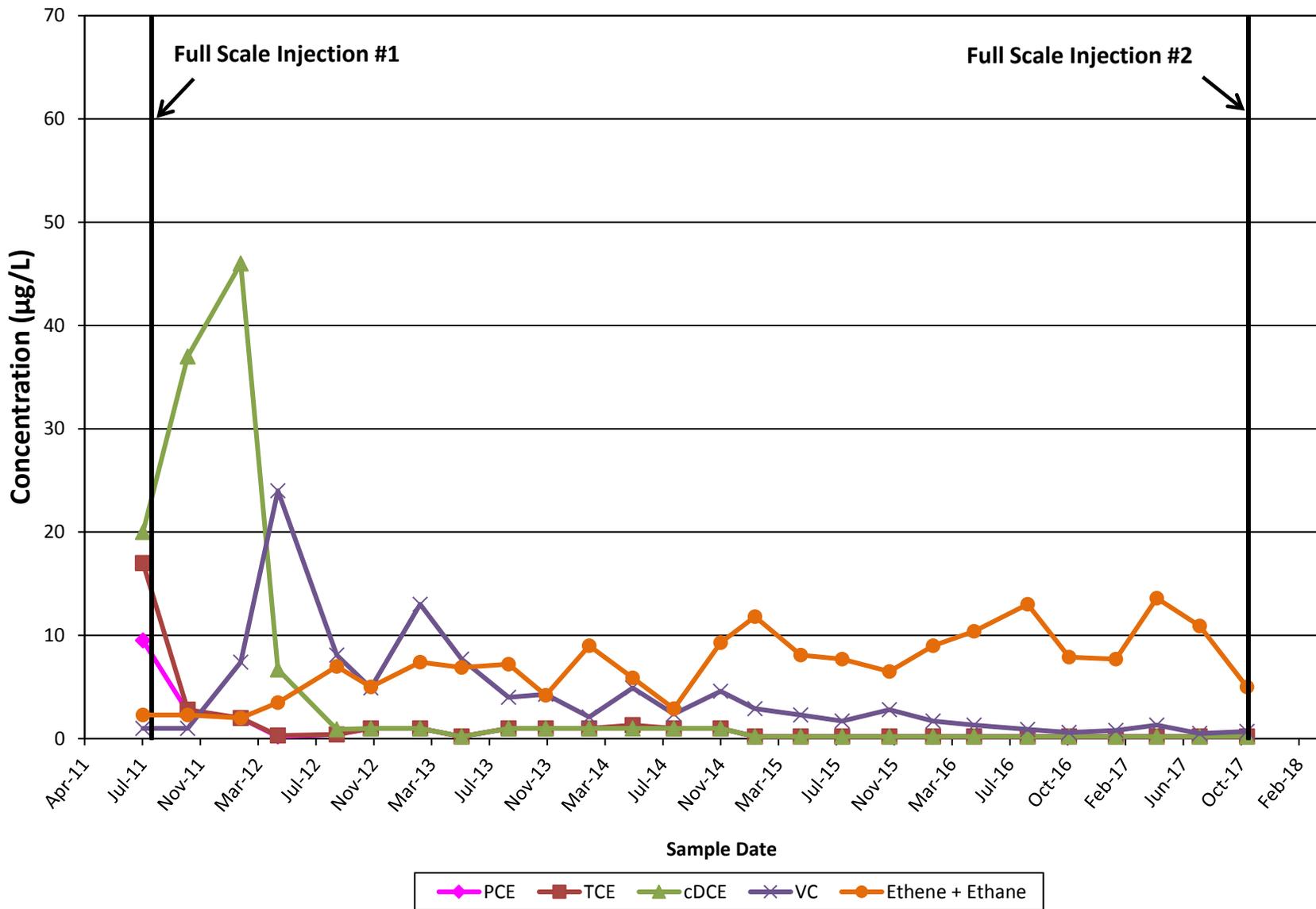
Figure
8



Boeing Developmental Center
Tukwila, Washington

Plume Injection Well
BDC-05-10 VOCs

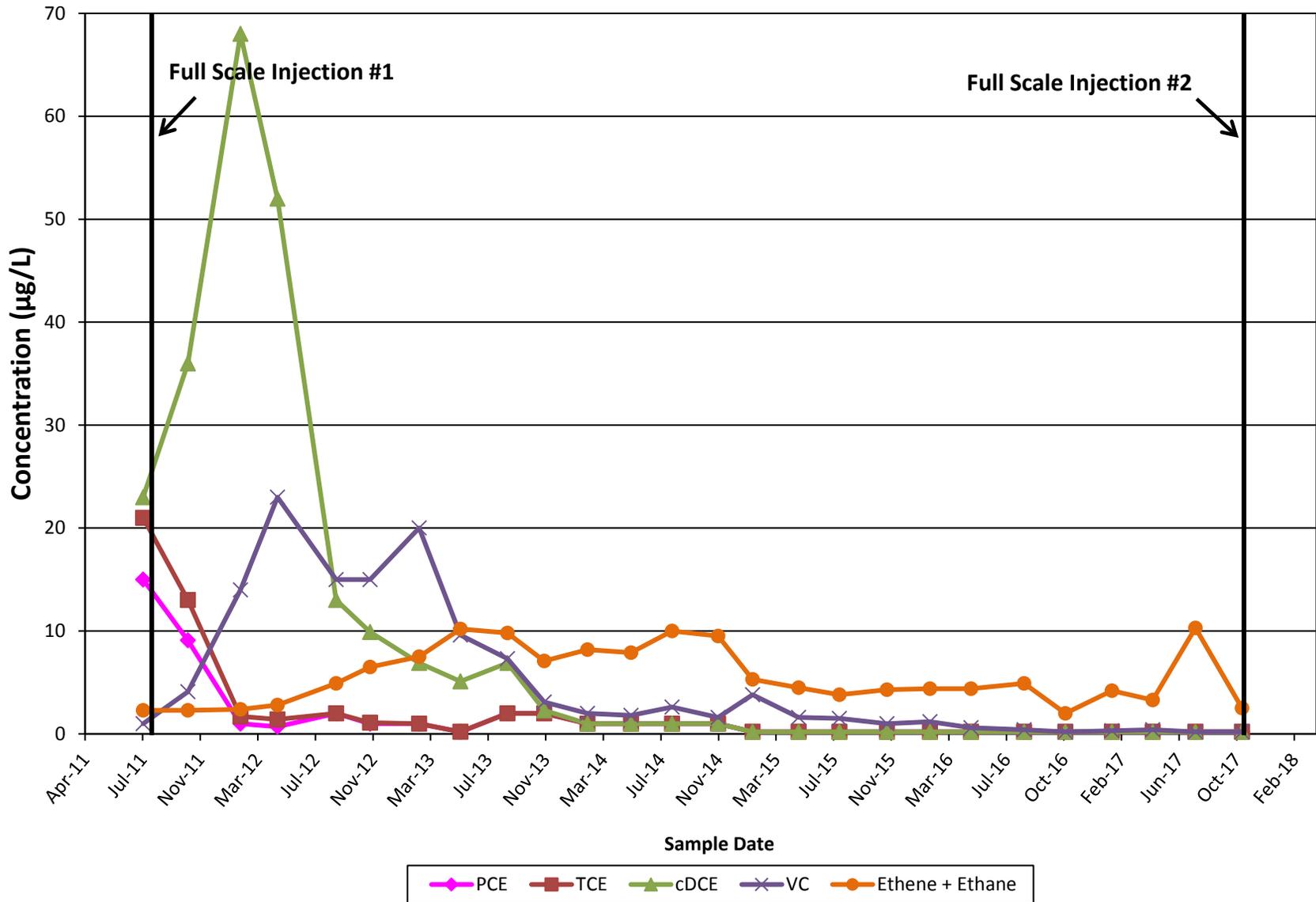
Figure
9



Boeing Developmental Center
Tukwila, Washington

Plume Injection Well
BDC-05-16 VOCs

Figure
10

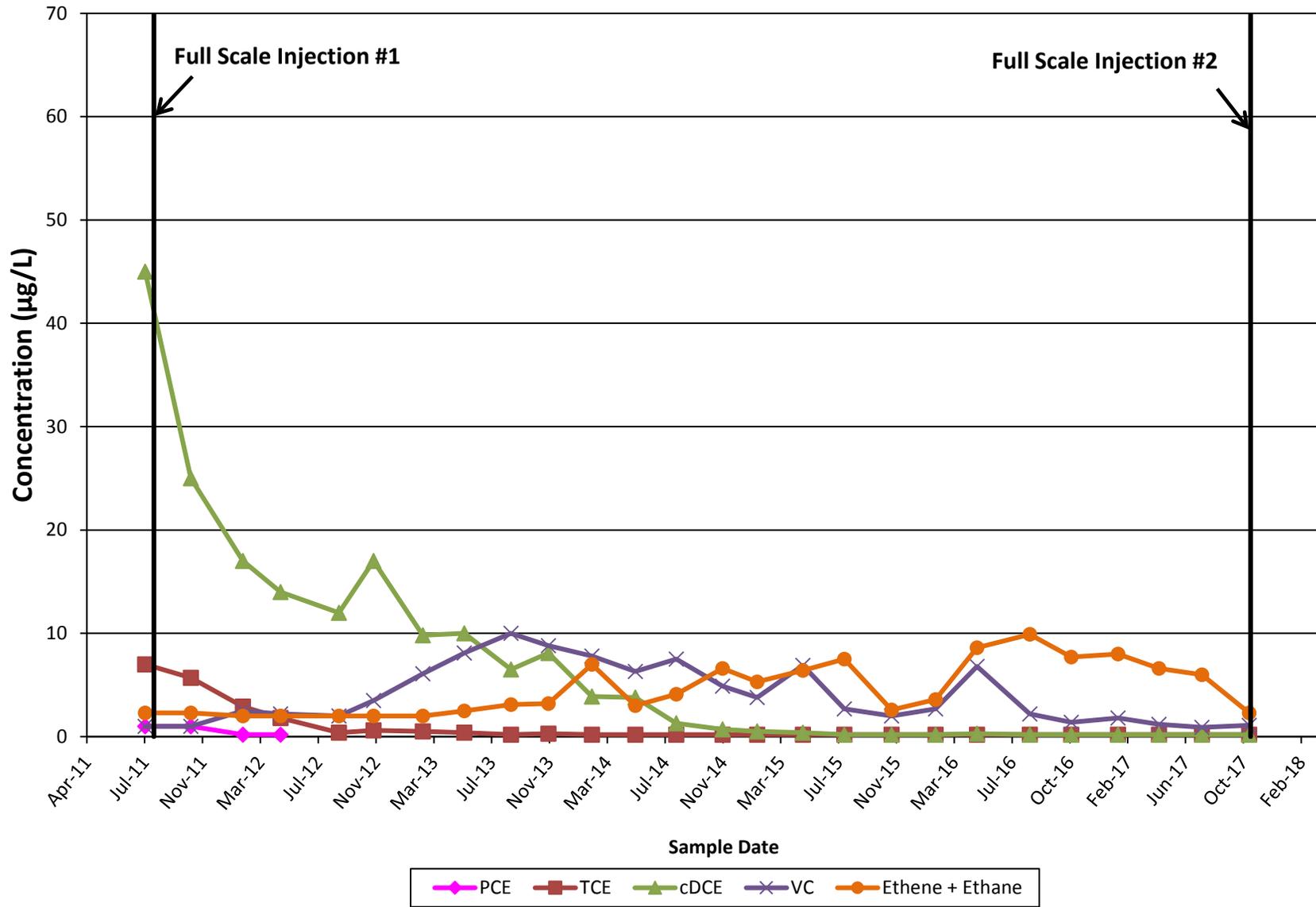


Boeing Developmental Center
Tukwila, Washington

**Monitoring Well
BDC-05-19 VOCs**

Figure
11

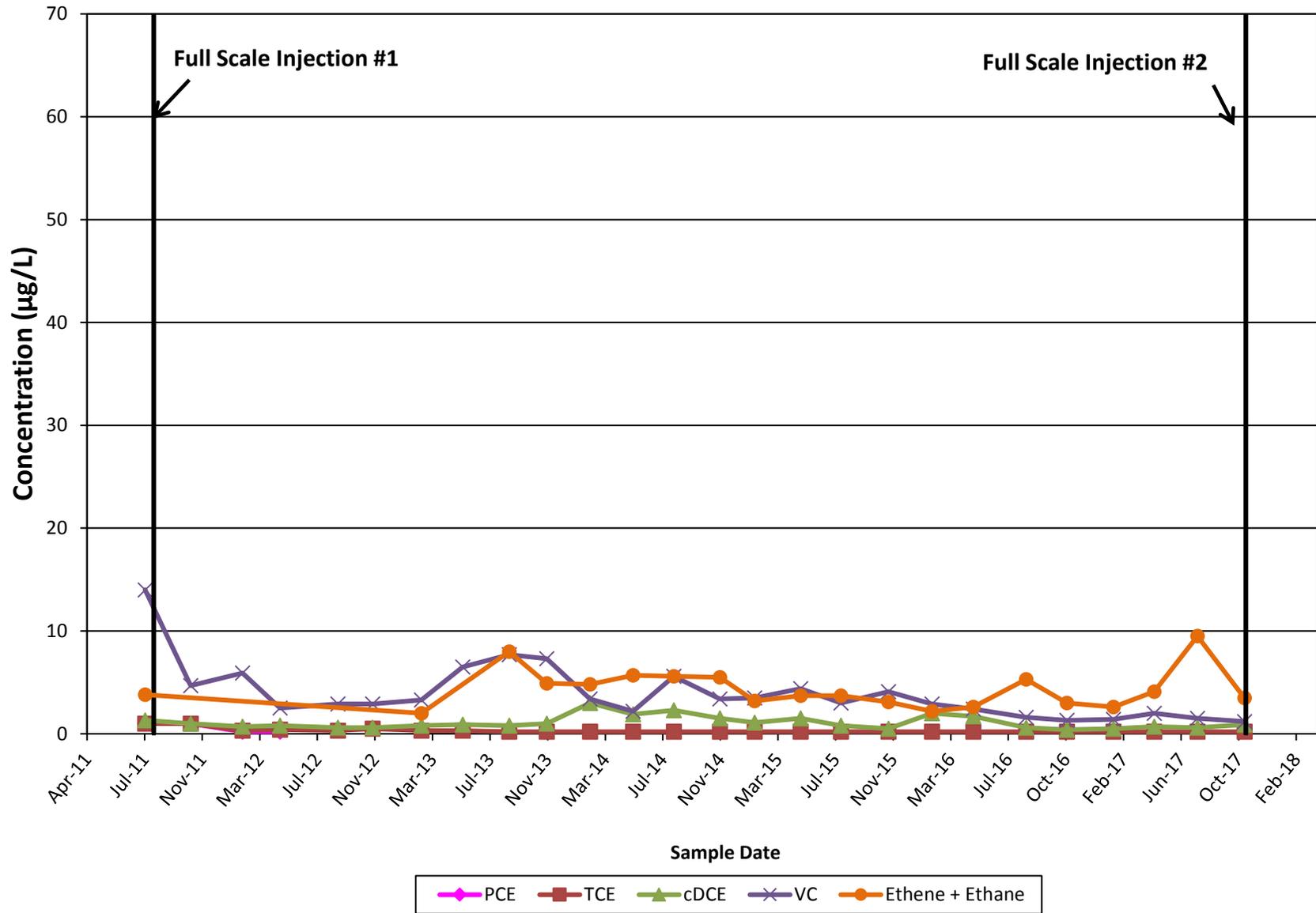




Boeing Developmental Center
Tukwila, Washington

**Monitoring Well
BDC-05-20 VOCs**

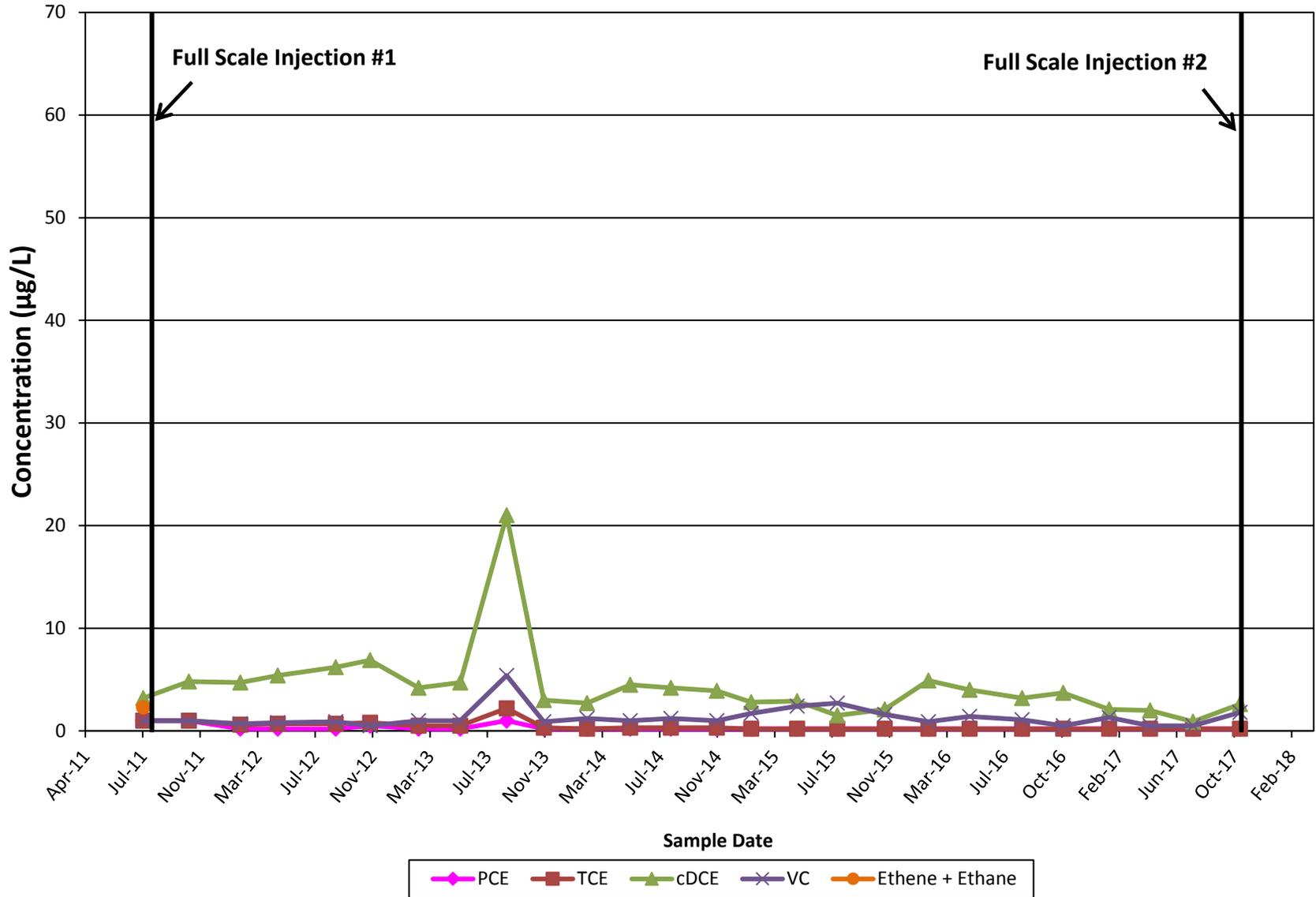
Figure
12



Boeing Developmental Center
Tukwila, Washington

Monitoring Well
BDC-05-21 VOCs

Figure
13

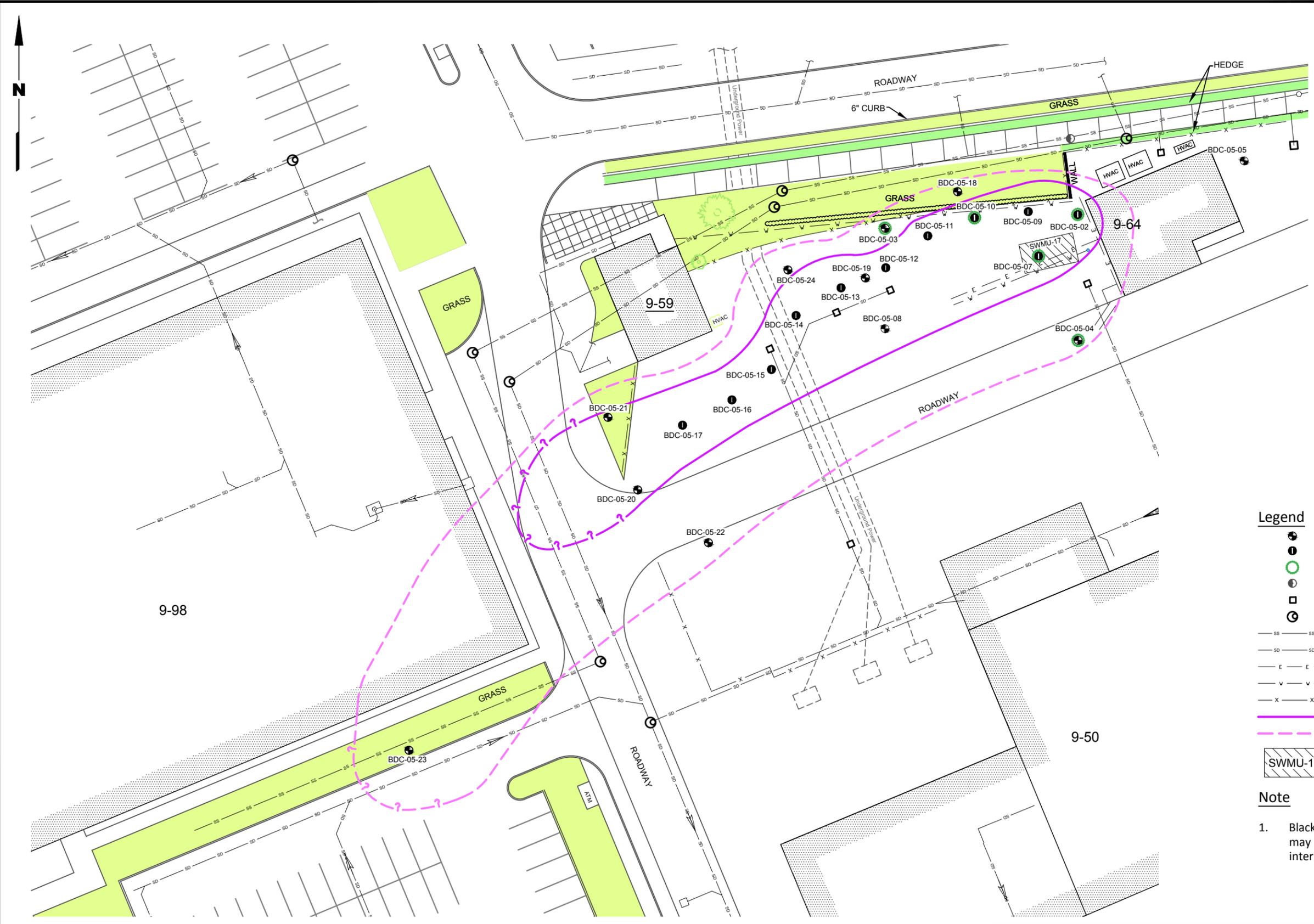


Boeing Developmental Center
Tukwila, Washington

**Monitoring Well
BDC-05-23 VOCs**

Figure
14

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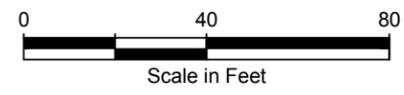


Legend

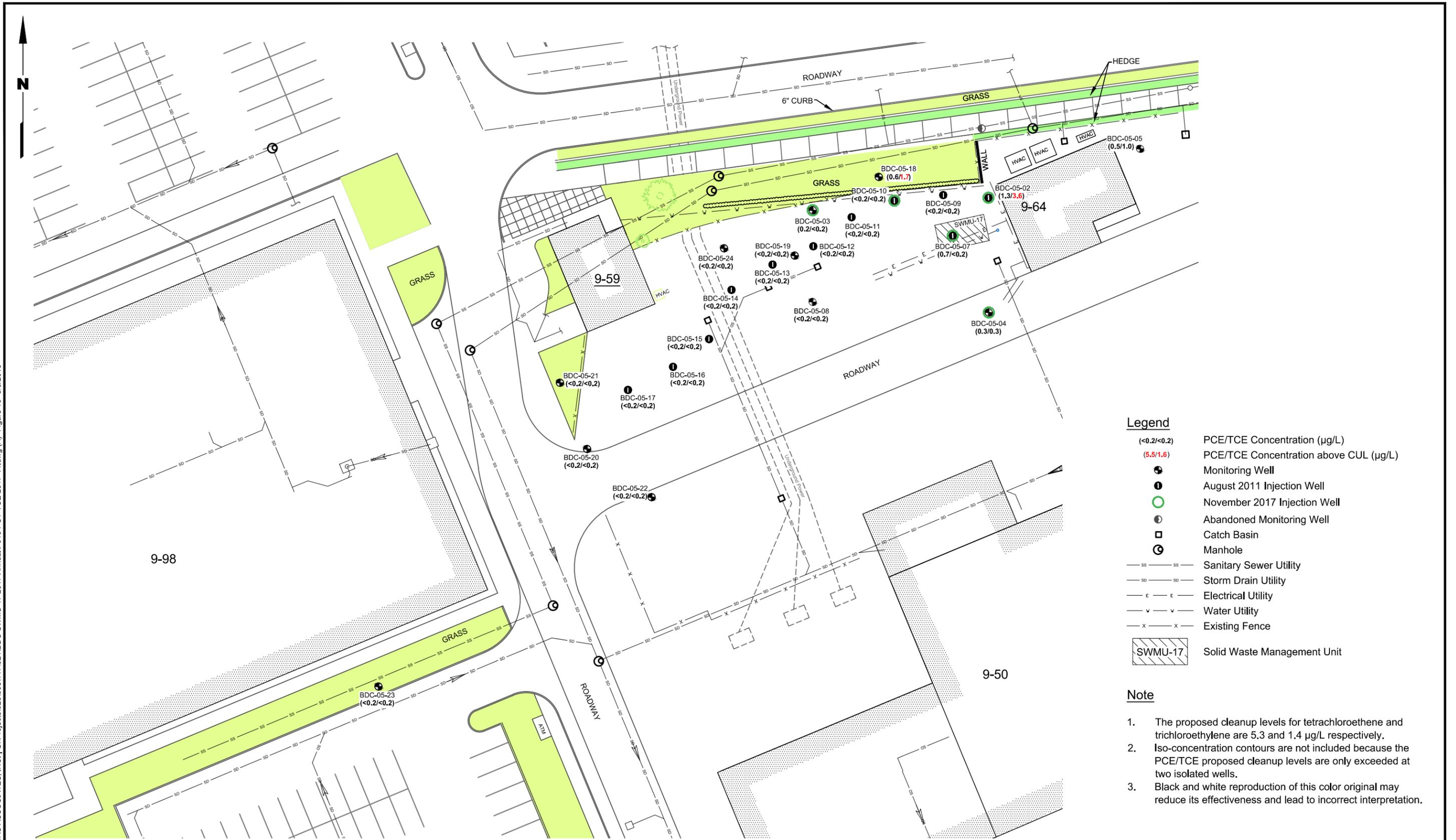
- Monitoring Well
- August 2011 Injection Well
- November 2017 Injection Well
- Abandoned Monitoring Well
- Catch Basin
- Manhole
- Sanitary Sewer Utility
- Storm Drain Utility
- Electrical Utility
- Water Utility
- Existing Fence
- Direct Evidence of Enhanced Bioremediation
- Some Evidence of Enhanced Bioremediation
- Solid Waste Management Unit

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Boeing Developmental Center Tukwila, Washington	Treatment Conditions	Figure 15
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Legend

- (<0.2/<0.2) PCE/TCE Concentration (µg/L)
- (5.5/1.6) PCE/TCE Concentration above CUL (µg/L)
- Monitoring Well
- August 2011 Injection Well
- November 2017 Injection Well
- Abandoned Monitoring Well
- Catch Basin
- ⊙ Manhole
- SS Sanitary Sewer Utility
- SD Storm Drain Utility
- E Electrical Utility
- W Water Utility
- X Existing Fence
- SWMU-17 Solid Waste Management Unit

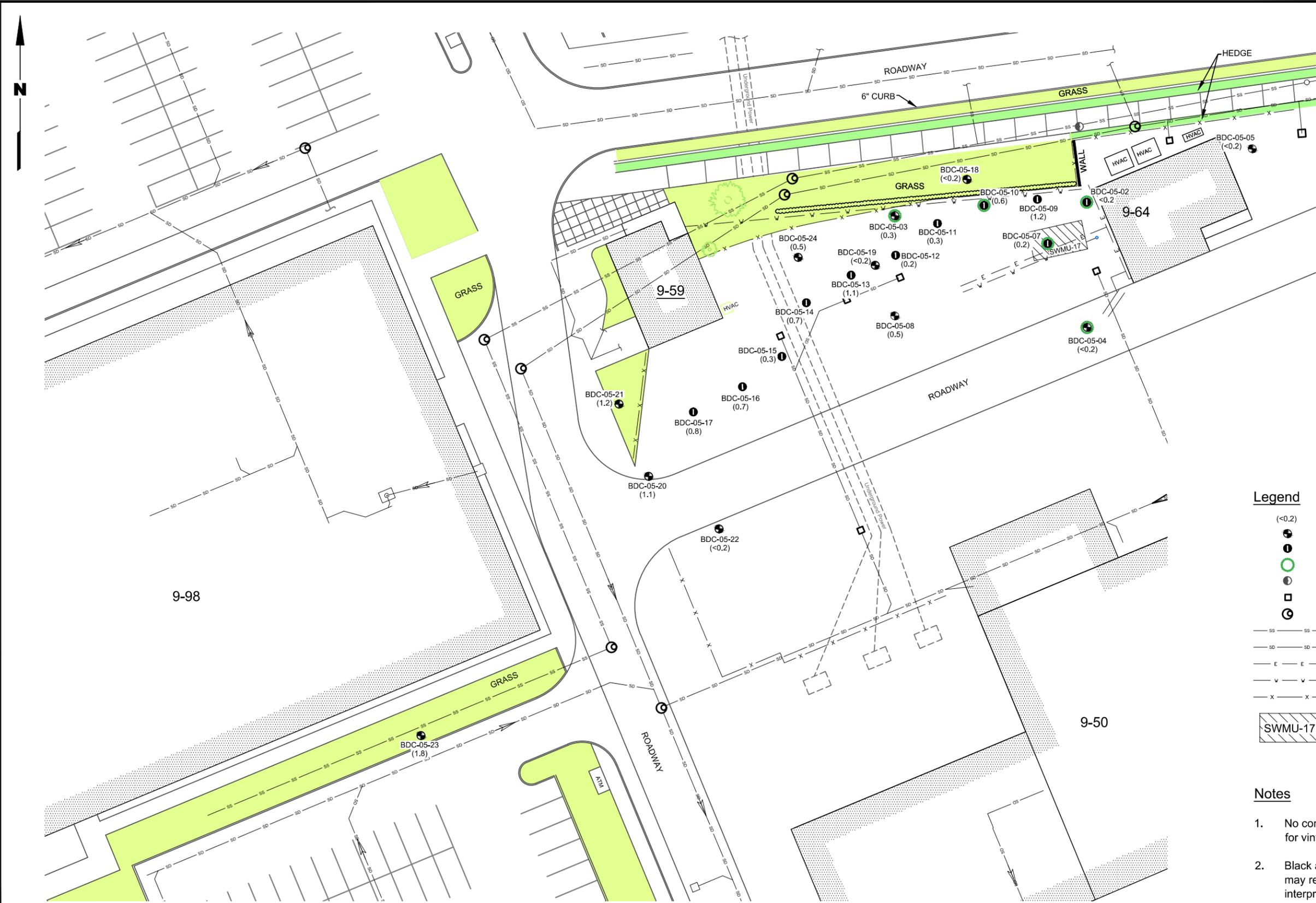
- Note**
- The proposed cleanup levels for tetrachloroethene and trichloroethylene are 5.3 and 1.4 µg/L respectively.
 - Iso-concentration contours are not included because the PCE/TCE proposed cleanup levels are only exceeded at two isolated wells.
 - Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.



Boeing Developmental Center
Tukwila, Washington

**PCE/TCE in Groundwater
November 2017**

Figure
16



Legend

- (<0.2) Vinyl Chloride Concentration (µg/L)
- Monitoring Well
- August 2011 Injection Well
- November 2017 Injection Well
- Abandoned Monitoring Well
- Catch Basin
- ⊙ Manhole
- SS — Sanitary Sewer Utility
- SD — Storm Drain Utility
- E — Electrical Utility
- W — Water Utility
- - - Existing Fence
- SWMU-17 Solid Waste Management Unit

- Notes**
- No concentrations exceed the proposed cleanup level for vinyl chloride of 2.4 µg/L.
 - Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

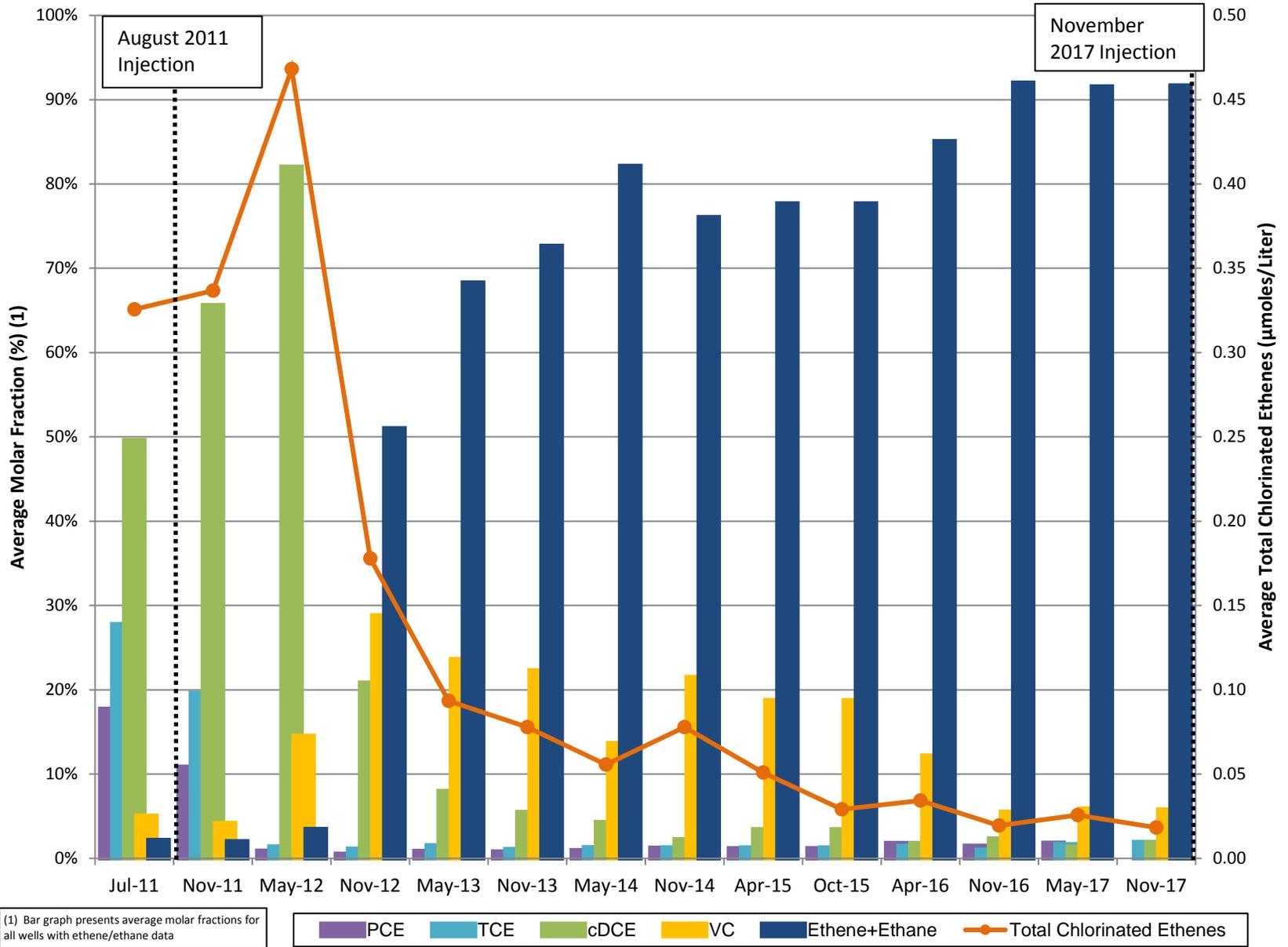


Table 1
Groundwater Data Summary
Boeing Developmental Center
SWMU-17

Well	Date	Pilot Injection Elapsed Time From Injection (days)	Full Injection #1 Elapsed Time From Injection (days)	Full Injection #2 Elapsed Time From Injection (days)	Volatile Organic Compounds							Metals				Aquifer Redox Conditions					Donor Indicators		VOCs- micromoles/Liter (b)							Molar Fraction (c)						
					PCE	TCE	cDCE	VC	Ethene	Ethane	Acetylene	As, Tot	As, Dis	Cu, Tot	Cu, Dis	DO	Nitrate	Iron II	Sulfate	Methane	ORP	TOC	pH	PCE	TCE	cDCE	VC	Ethene	Ethane	Total Chloroethenes (d)	Ethene + Ethane	PCE	TCE	cDCE	VC	Ethene + Ethane
					(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg-N/L)	(mg/L)	(mg/L)	(mg/L)	(mV)	(mg/L)														
Proposed Groundwater Cleanup Levels (a)					5.3	1.4	134	2.4	NA	NA	NA	0.008	0.008	0.008	0.008																					
BDC-05-03	11/13/2013	1842	818		1.3	1.2	0.2	<0.2	<1.0	<1.0	<1.0	0.008	0.001	0.003	<0.002	3.19		1.6	10.5	0.45	-272	4.3	6.24	0.01	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.41	0.48	0.11	0.00	0.00
BDC-05-03	5/13/2014	2023	999		1.5	0.7	<0.2	<0.2	<1.0	1.1	<1.0	0.003	<0.001	0.002	<0.002	4.08		1.4	9.6	1.00	-206	5.4	6.30	0.01	0.01	0.00	0.00	0.00	0.04	0.01	0.04	0.18	0.10	0.00	0.00	0.72
BDC-05-03	11/10/2014	2204	1180		2.1	0.6	<0.2	<0.2	<1.0	<1.0	<1.0	0.002	0.001	0.003	<0.002	0.07		0.8	5.6	0.07	81	1.1	5.72	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.73	0.27	0.00	0.00	0.00
BDC-05-03	4/27/2015	2372	1348		1.5	0.4	<0.2	0.4	<1.0	<1.0	<1.0	0.002	0.003	0.004	<0.002	0.93		0.6	4.1	0.74	43	1.7	5.85	0.01	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.49	0.16	0.00	0.35	0.00
BDC-05-03	10/28/2015	2556	1532		0.6	0.4	<0.2	0.3	<1.0	1.1	<1.0	0.012	0.006	0.009	0.002	0.09		1.0	1.2	5.9	-13	6.5	6.40	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.04	0.08	0.06	0.00	0.10	0.76
BDC-05-03	4/20/2016	2731	1707		1.2	0.2	<0.2	<0.2	<1.0	<1.0	<1.0	0.002	0.002	0.003	<0.002	0.58		6.5	2.8	41	1.4	5.97	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.83	0.17	0.00	0.00	0.00	
BDC-05-03	11/3/2016	2928	1904		1.4	0.3	<0.2	<0.2	<1.0	<1.0	<1.0	0.007	0.006	<0.002	<0.002	0.77		3.0	7.7	0.31	5.4	2.3	5.91	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.79	0.21	0.00	0.00	0.00
BDC-05-03	5/4/2017	3110	2086		1.4	0.3	<0.2	<0.2	<1.0	<1.0	<1.0	0.003	<0.0004	0.003	<0.002	1.95		0.0	7.2	<3.0	72.5	2.8	5.63	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.79	0.21	0.00	0.00	0.00
BDC-05-03	11/6/2017	3296	2272	-4	0.2	<0.2	<0.2	0.3	<1.0	3.4	<1.0	0.012	0.009	0.005	<0.002	0.22		3.6	<0.30	10.0	20.3	7.3	6.28	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.11	0.01	0.00	0.00	0.04	0.95
BDC-05-04 (MW 22 ft XG)	5/21/2007	-526			<1.0	<1.0	1.4	<1.0				0.018	<0.001	<0.002	<0.002									0.00	0.00	0.01	0.00		0.01		0.00	0.00	1.00	0.00		
	11/26/2007	-337			<1.0	<1.0	1.6	<1.0				0.009	<0.001	<0.002	<0.002									0.00	0.00	0.02	0.00		0.02		0.00	0.00	1.00	0.00		
	5/22/2008	-159			1.5	0.9	1.2	<0.2				0.018	<0.001	<0.002	<0.002									0.01	0.01	0.01	0.00		0.03		0.32	0.24	0.44	0.00		
BDC-05-04	10/23/2008	-5			1.1	0.8	2.1	<0.2	<1.1	<1.2	<1.1	0.009	<0.001	<0.002	<0.002	2.45	7.6	0.1	31.0	0.3	73.5	3.8	6.33	0.01	0.01	0.02	0.00	0.00	0.00	0.03	0.00	0.19	0.18	0.63	0.00	0.00
BDC-05-04	11/20/2008	23			1.1	0.7	3.6	<0.2	<1.1	<1.2	<1.1	0.019	<0.001	<0.002	<0.002	0.59	4.5	0.8	25.2	0.05	-16	5.1	6.25	0.01	0.01	0.04	0.00	0.00	0.00	0.05	0.00	0.14	0.11	0.76	0.00	0.00
BDC-05-04	12/16/2008	49			1.0	<1.0	2.4	<1.0	<1.1	<1.2	<1.1	0.019	0.002	0.003	<0.002	0.55	5.5	1.0	30.4	1.6	-98	6.9	6.24	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	1/16/2009	80			<1.0	<1.0	2.0	<1.0	<1.1	<1.2	<1.1	0.017	<0.001	<0.002	<0.002	0.06	4.3	1.0	21.8	1.5	-192	5.1	6.23	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	2/11/2009	106			1.0	<1.0	1.5	<1.0	<1.1	<1.2	<1.1	0.020	<0.001	<0.002	<0.002	2.45	5.9	1.0	31.8	1.1	-54	6.8	6.17	0.01	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.28	0.00	0.72	0.00	0.00
BDC-05-04	3/9/2009	132			1.0	<1.0	1.3	<1.0	<1.1	<1.2	<1.1	0.014	0.001	0.002	<0.002	0.27	4.8	1.5	30.1	0.2	35	5.2	6.22	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.31	0.00	0.69	0.00	0.00
BDC-05-04	4/16/2009	170			1.2	<1.0	<1.0	<1.0	<1.1	<1.2	<1.1	0.011	0.001	<0.002	<0.002	1.48	5.9	1.4	33.6	<0.0007	68	5.7	6.29	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.00	0.00	0.00	0.00	0.00
BDC-05-04	5/13/2009	197			<1.0	<1.0	1.0	<1.0	<1.1	<1.2	<1.1	0.007	0.001	0.002	<0.002	0.33	4.5	1.6	26.6	0.4	49	5.2	6.37	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	8/16/2009	292			1.3	<1.0	<1.0	<1.0	<1.1	<1.2	<1.1	0.012	0.001	0.002	<0.002	0.86	5.4	2.2	30.6	<0.0007	93	5.0	6.97	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	1.00	0.00	0.00	0.00	0.00
BDC-05-04	11/13/2009	381			<1.0	<1.0	1.2	<1.0	<1.1	<1.2	<1.1	0.005	0.001	<0.002	<0.002	0.56	2.2	3.0	18.4	2.4	109	4.4	5.86	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	2/16/2010	476			<1.0	<1.0	1.1	<1.0	<1.1	<1.2	<1.1	0.004	0.002	0.012	0.002	0.88	<0.1	3.3	24.6	1.5	899	8.9	6.24	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	5/18/2010	567			1.1	<1.0	1.2	<1.0	<1.1	<1.2	<1.1	0.014	0.001	0.005	<0.002	0.75	<0.1	3.0	25.4	1.3	473	7.1	6.19	0.01	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.35	0.00	0.65	0.00	0.00
BDC-05-04	8/17/2010	658			<1.0	<1.0	3.0	<1.0	<1.1	<1.2	<1.1	0.012	0.002	0.006	<0.002	1.00	<0.1	2.8	17.7	3.5	108	8.7	6.48	0.00	0.00	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	11/9/2010	742			<1.0	<1.0	4.3	<1.0	<1.1	<1.2	<1.1	0.008	0.004	<0.002	<0.002	2.21	<0.1	2.2	21.3	3.0	101	7.2	6.84	0.00	0.00	0.04	0.00	0.00	0.00	0.04	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	2/15/2011	840			<1.0	<1.0	2.9	<1.0	<1.1	<1.2	<1.1	0.007	0.004	<0.002	<0.002	2.50	<0.1	2.4	19.4	4.5	93	6.9	6.85	0.00	0.00	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00	1.00	0.00	0.00
BDC-05-04	5/2/2011	916	-108		0.4	0.5	3.1	<0.2	<1.1	<1.2	<1.1	0.008	0.004	<0.002	<0.002	1.69	<0.1	2.2	18.0	1.8	49	6.8	6.76	0.00	0.00	0.03	0.00	0.00	0.00	0.04	0.00	0.06	0.10	0.84	0.00	0.00
BDC-05-04	11/2/2011	1100	76		<1.0	<1.0	4.2	<1.0				0.007	0.006	<0.002	<0.002	1.52	<1.0	1.2	<1.0		-3	6.6	7.17	0.00	0.00	0.04	0.00		0.04		0.00	0.00	1.00	0.00		
BDC-05-04	5/7/2012	1287	263		0.4	0.6	3.6	<0.2				0.017	0.016	<0.002	<0.002	0.16	2.0	21.5			98	8.6	6.39	0.00	0.00	0.04	0.00		0.04		0.05	0.10	0.84	0.00		
BDC-05-04	11/13/2012	1477	453		<0.5	<0.5	3.3	<0.5				0.012	0.010	0.002	<0.002	0.02		1.2	14.3		27	6.5	6													

Table 1
Groundwater Data Summary
Boeing Developmental Center
SWMU-17

Well	Date	Pilot Injection Elapsed Time From Injection (days)	Full Injection #1 Elapsed Time From Injection (days)	Full Injection #2 Elapsed Time From Injection (days)	Volatile Organic Compounds							Metals				Aquifer Redox Conditions					Donor Indicators		VOCs- micromoles/Liter (b)							Molar Fraction (c)									
					PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	As, Tot (mg/L)	As, Dis (mg/L)	Cu, Tot (mg/L)	Cu, Dis (mg/L)	DO (mg/L)	Nitrate (mg-N/L)	Iron II (mg/L)	Sulfate (mg/L)	Methane (mg/L)	ORP (mV)	TOC (mg/L)	pH	PCE	TCE	cDCE	VC	Ethene	Ethane	Total Chloroethenes (d)	Ethene + Ethane	PCE	TCE	cDCE	VC	Ethene + Ethane			
					5.3	1.4	134	2.4	NA	NA	NA	0.008	0.008	0.008	0.008																								
BDC-05-05	4/27/2015	2372	1348		0.4	1.0	<0.2	<0.2				0.001	0.001	0.003	<0.002	3.14	0.0	16.1		31	<1.0	6.25	0.00	0.01	0.00	0.00		0.01		0.24	0.76	0.00	0.00						
BDC-05-05	10/28/2015	2556	1532		0.4	0.9	<0.2	<0.2				0.001	<0.0004	<0.002	<0.002	0.81		0.3	13.2		0	<1.0	6.39	0.00	0.01	0.00	0.00		0.01		0.26	0.74	0.00	0.00					
BDC-05-05	4/21/2016	2732	1708		0.3	0.6	<0.2	<0.2				0.001	<0.0004	<0.002	<0.002	4.00		0.0	13.4		14.5	<1.0	6.37	0.00	0.00	0.00	0.00		0.01		0.28	0.72	0.00	0.00					
BDC-05-05	11/2/2016	2927	1903		0.8	1.5	<0.2	<0.2				0.001	0.0004	0.003	0.003	0.29		0.0	35.7		6.6	3.2	6.54	0.00	0.01	0.00	0.00		0.02		0.30	0.70	0.00	0.00					
BDC-05-05	5/3/2017	3109	2085		0.4	0.7	<0.2	<0.2				0.001	<0.0004	0.003	<0.002	4.43		0.0	21.3		74.9	1.9	6.29	0.00	0.01	0.00	0.00		0.01		0.31	0.69	0.00	0.00					
BDC-05-05	11/6/2017	3296	2272	-4	0.5	1.0	<0.2	<0.2				0.001	<0.0004	0.004	0.002	0.87		0.0	39.0		-29.2	2.7	6.63	0.00	0.01	0.00	0.00		0.01		0.28	0.72	0.00	0.00					
BDC-05-07 (IW)	5/21/2007	-526			30	22	10	<1.0				0.003	<0.001	0.014	0.009														0.18	0.17	0.10	0.00		0.45		0.40	0.37	0.23	0.00
	11/26/2007	-337			28	25	11	<1.0				<0.001	<0.001	0.011	0.002														0.17	0.19	0.11	0.00		0.47		0.36	0.40	0.24	0.00
	5/22/2008	-159			33	32	9.2	<0.2				0.002	<0.001	0.012	0.006														0.20	0.24	0.09	0.00		0.54		0.37	0.45	0.18	0.00
BDC-05-07	10/23/2008	-5			22	24	14	<0.2	<1.1	<1.2	<1.1	0.004	0.002	0.022	0.013	9.71	9.6	0.0	33.4	0.6	86.0	7.8	6.47	0.13	0.18	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.29	0.40	0.31	0.00	0.00
BDC-05-07	11/20/2008	23			17	17	4.9	<0.2	<1.1	<1.2	<1.1	0.003	<0.001	0.016	0.010	0.60	2.2	0.4	15.8	0.2	-27	4.6	6.46	0.10	0.13	0.05	0.00	0.00	0.00	0.00	0.28	0.00	0.36	0.46	0.18	0.00	0.00		
BDC-05-07	12/16/2008	49			16	25	7.2	<1.0	<1.1	<1.2	<1.1	0.003	0.001	0.016	0.012	1.20	4.8	0.0	29.4	0.6	-107	6.1	6.49	0.10	0.19	0.07	0.00	0.00	0.00	0.36	0.00	0.27	0.53	0.21	0.00	0.00			
BDC-05-07	1/16/2009	80			20	23	6.4	<1.0	<1.1	<1.2	<1.1	0.002	<0.001	0.013	0.008	0.00	8.4	0.0	32.6	0.03	-182	6.3	6.38	0.12	0.18	0.07	0.00	0.00	0.00	0.36	0.00	0.33	0.48	0.18	0.00	0.00			
BDC-05-07	2/11/2009	106			23	28	9.9	<1.0	<1.1	<1.2	<1.1	0.002	0.001	0.017	0.012	2.05	11.2	0.0	37.5	1.5	-68	9.3	6.37	0.14	0.21	0.10	0.00	0.00	0.00	0.45	0.00	0.31	0.47	0.22	0.00	0.00			
BDC-05-07	3/9/2009	132			20	21	8.4	<1.0	<1.1	<1.2	<1.1	<0.002	<0.001	0.013	0.009	0.00	8.8	0.3	35.3	5.5	-23	6.8	6.37	0.12	0.16	0.09	0.00	0.00	0.00	0.37	0.00	0.33	0.44	0.24	0.00	0.00			
BDC-05-07	4/16/2009	170			20	21	11	<1.0	<1.1	<1.2	<1.1	0.002	0.001	0.015	0.008	0.27	8.2	0.0	31.2	5.1	35	8.1	6.43	0.12	0.16	0.11	0.00	0.00	0.00	0.39	0.00	0.31	0.41	0.29	0.00	0.00			
BDC-05-07	5/13/2009	197			11	13	7.5	<1.0	<1.1	<1.2		0.002	0.001	0.016	0.008	0.29	6.8	0.4	27.2	7.9	34	7.3	6.47	0.07	0.10	0.08	0.00	0.00	0.00	0.24	0.00	0.27	0.41	0.32	0.00	0.00			
BDC-05-07	8/16/2009	292			11	12	13	<1.0	<1.1	<1.2	<1.1	0.002	0.001	0.010	<0.002	0.74	2.3	2.0	23.2	6.8	67	8.2	6.73	0.07	0.09	0.13	0.00	0.00	0.00	0.29	0.00	0.23	0.31	0.46	0.00	0.00			
BDC-05-07	11/13/2009	381			6.5	5.3	5.6	<1.0	<1.1	<1.2	<1.1	0.002	0.001	0.004	<0.002	0.50	<0.1	2.8	5.7	4.7	16	9.1	6.48	0.04	0.04	0.06	0.00	0.00	0.00	0.14	0.00	0.29	0.29	0.42	0.00	0.00			
BDC-05-07	2/16/2010	476			6.4	6.9	28	<1.0	<1.1	<1.2	<1.1	0.004	0.003	0.017	0.006	1.04	<0.1	2.5	20.4	5.2	839	14.7	6.88	0.04	0.05	0.29	0.00	0.00	0.00	0.38	0.00	0.10	0.14	0.76	0.00	0.00			
BDC-05-07	5/18/2010	567			5.8	9.2	41	1.2	<1.1	<1.2	<1.1	0.009	0.003	0.009	<0.002	1.06	<0.5	2.0	16.4	6.0	525	14.8	6.77	0.03	0.07	0.42	0.02	0.00	0.00	0.55	0.00	0.06	0.13	0.77	0.04	0.00			
BDC-05-07	8/17/2010	658			2.8	7.8	19	<1.0	<1.1	<1.2	<1.1	0.006	0.003	0.008	<0.002	2.30	<0.1	2.5	8.6	7.1	-15	18.8	7.34	0.02	0.06	0.20	0.00	0.00	0.00	0.27	0.00	0.06	0.22	0.72	0.00	0.00			
BDC-05-07	11/9/2010	742			<1.0	9.4	20	<1.0	<1.1	<1.2	<1.1	0.008	0.005	0.009	<0.002	2.42	<0.1	2.2	15.2	5.1	13	15.2	7.35	0.00	0.07	0.21	0.00	0.00	0.00	0.28	0.00	0.00	0.26	0.74	0.00	0.00			
BDC-05-07	2/15/2011	840			<1.0	8.7	20	<1.0	<1.1	<1.2	<1.1	0.013	0.010	0.012	0.002	3.02	<0.1	2.8	11.8	5.1	21	14.0	7.16	0.00	0.07	0.21	0.00	0.00	0.00	0.27	0.00	0.00	0.24	0.76	0.00	0.00			
BDC-05-07	5/2/2011	916	-108		5.2	11	17	<0.2	<1.1	<1.2	<1.1	0.017	0.004	0.014	0.003	2.14	0.1	2.6	15.6	3.2	33	16.8	6.90	0.03	0.08	0.18	0.00	0.00	0.00	0.29	0.00	0.11	0.29	0.60	0.00	0.00			
BDC-05-07	11/2/2011	1100	76		11	6.9	39	<1.0	<1.1	<1.2	<1.1	0.042	0.035	0.010	0.006	2.06	<0.1	2.4	<1.0	16.1	-51	1780	6.31	0.07	0.05	0.40	0.00	0.00	0.00	0.52	0.00	0.13	0.10	0.77	0.00	0.00			
BDC-05-07	5/7/2012	1287	263		0.8	<0.2	23	0.9	<1.0	<1.0	<1.0	0.026	0.024	0.003	<0.002	0.17	<0.1	1.6	0.4	27.0	100	48.5	6.34	0.00	0.00	0.24	0.01	0.00	0.00	0.26	0.00	0.02	0.00	0.93	0.06	0.00			
BDC-05-07	11/15/2012	1479	455		<0.2	0.4	24	0.8	<1.0	<1.0	<1.0	0.016	0.017	<0.002	<0.002	0.01		1.6	<0.3	23.0	3.0	26	6.60	0.00	0.00	0.25	0.01	0.00	0.00	0.26	0.00	0.00	0.01	0.94	0.05	0.00			
BDC-05-07	5/22/2013	1667	643		<0.2	0.3	8.6	0.5	<1.0	<1.0	<1.0	0.006	0.007	<0.002	<0.002	0.17	1.4	0.45	11.0	-372	10.5	8.09	0.00	0.00	0.09	0.01	0.00	0.00	0.10	0.00	0.00	0.02	0.90	0.08	0.00				
BDC-05-07	11/13/2013	1842	818		<0.2	<0.2	3.4	1.6	<1.0	1.3	<1.0	0.006	0.007	<0.002	<0.002	2.12	1.2	<0.30	8.5	-276	8.8	6.07	0.00	0.00	0.04	0.03	0.00	0.04	0.06	0.04	0.00	0.00	0.34	0.25	0.42	0.00			
BDC-05-07	5/13/2014	2023	999		<0.2	0.2	2.5	1.4	<1.0	<1.0	<1.0	0.004	0.004	<0.002	<0.002	3.65	2.0	1.8	3.7	-368	9.1	6.55	0.00	0.00	0.03	0.02	0.00	0.00	0.05	0.00	0.00	0.03	0.52	0.45	0.00				
BDC-05-07	11/11/2014	2205	1181		<0.2	<0.2	4.1	13	26	3.0	<1.0	0.006	0.005	<0.002	<0.002	0.21	2.6																						

Table 1
Groundwater Data Summary
Boeing Developmental Center
SWMU-17

Well	Date	Pilot Injection Elapsed Time From Injection (days)	Full Injection #1 Elapsed Time From Injection (days)	Full Injection #2 Elapsed Time From Injection (days)	Volatile Organic Compounds							Metals				Aquifer Redox Conditions					Donor Indicators		VOCs- micromoles/Liter (b)							Molar Fraction (c)						
					PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	As, Tot (mg/L)	As, Dis (mg/L)	Cu, Tot (mg/L)	Cu, Dis (mg/L)	DO (mg/L)	Nitrate (mg-N/L)	Iron II (mg/L)	Sulfate (mg/L)	Methane (mg/L)	ORP (mV)	TOC (mg/L)	pH	PCE	TCE	cDCE	VC	Ethene	Ethane	Total Chloroethenes (d)	Ethene + Ethane	PCE	TCE	cDCE	VC	Ethene + Ethane
					5.3	1.4	134	2.4	NA	NA	NA	0.008	0.008	0.008	0.008																					
BDC-05-09 (IW)	7/31/2011		-18		30	20	22	<1.0	<1.1	<1.2	<1.1	0.007	0.007	<0.002	<0.002	1.37	<0.1	2.5	12.1	1.4	15	5.5	6.89	0.18	0.15	0.23	0.00	0.00	0.00	0.56	0.00	0.32	0.27	0.41	0.00	0.00
	11/2/2011		76		37	56	44	1.3	<1.1	<1.2	<1.1	0.042	0.040	0.009	0.006	2.80	<0.1	3.0	7.6	4.3	80	4360	5.24	0.22	0.43	0.45	0.02	0.00	0.00	1.12	0.00	0.20	0.38	0.40	0.02	0.00
	5/7/2012		263		3.0	1.1	250	3.9	<1.0	<1.0	<1.0	0.059	0.052	0.011	<0.002	0.69		2.2	0.5	18.0	85	531	6.33	0.02	0.01	2.58	0.06	0.00	0.00	2.67	0.00	0.01	0.00	0.97	0.02	0.00
BDC-05-09	11/15/2012		455		<2.0	<2.0	24	20	69	<1.0	<1.0	0.074	0.070	0.006	<0.002	0.01		1.2	<0.3	27.0	-10	266	6.71	0.00	0.00	0.25	0.32	2.46	0.00	0.57	2.46	0.00	0.00	0.08	0.11	0.81
BDC-05-09	5/22/2013		643		<0.2	<0.2	1.0	3.7	23	3.4	<1.0	0.026	0.025	0.003	<0.002	0.18		1.5	<0.3	17.0	-300	40.6	7.83	0.00	0.00	0.01	0.06	0.82	0.11	0.07	0.93	0.00	0.00	0.01	0.06	0.93
BDC-05-09	11/13/2013		818		<0.2	<0.2	3.2	14	8.6	8.3	<1.0	0.022	0.022	<0.002	<0.002	2.80		1.4	0.9	11.0	-263	36.8	6.61	0.00	0.00	0.03	0.22	0.31	0.28	0.26	0.58	0.00	0.00	0.04	0.27	0.69
BDC-05-09	5/13/2014		999		<0.2	<0.2	0.7	1.0	1.6	8.5	<1.0	0.010	0.010	<0.002	<0.002	3.66		1.5	1.9	8.0	-356	13.1	6.53	0.00	0.00	0.01	0.02	0.06	0.28	0.02	0.34	0.00	0.00	0.02	0.04	0.94
BDC-05-09	11/11/2014		1181		<0.2	<0.2	1.1	3.5	1.2	6.4	<1.0	0.018	0.017	<0.002	<0.002	0.08		2.3	0.72	8.5	-47	6.9	6.19	0.00	0.00	0.01	0.06	0.04	0.21	0.07	0.26	0.00	0.00	0.04	0.17	0.79
BDC-05-09	4/27/2015		1348		<0.2	<0.2	0.4	8.3	5.0	4.3	<1.0	0.007	0.009	<0.002	<0.002	0.04		1.4	0.68	7.5	-53	4.0	6.27	0.00	0.00	0.00	0.13	0.18	0.14	0.14	0.32	0.00	0.00	0.01	0.29	0.70
BDC-05-09	10/28/2015		1532		<0.2	<0.2	0.3	2.1	<1.0	2.0	<1.0	0.008	0.008	<0.002	<0.002	0.15		1.0	<0.30	5.3	-5.3	2.5	6.36	0.00	0.00	0.00	0.03	0.00	0.07	0.04	0.07	0.00	0.00	0.03	0.33	0.64
BDC-05-09	4/20/2016		1707		<0.2	<0.2	<0.2	2.8	1.9	8.4	<1.0	0.007	0.009	<0.002	<0.002	0.08		3.0	<0.30	6.6	-30	2.8	6.36	0.00	0.00	0.00	0.04	0.07	0.28	0.04	0.35	0.00	0.00	0.00	0.11	0.89
BDC-05-09	11/2/2016		1903		<0.2	<0.2	<0.2	1.3	1.0	9.2	<1.0	0.009	0.009	<0.002	<0.002	0.41		1.6	2.8	7.6	-82.3	5.2	6.36	0.00	0.00	0.00	0.02	0.04	0.31	0.02	0.34	0.00	0.00	0.00	0.06	0.94
BDC-05-09	5/4/2017		2086		<0.2	<0.2	0.4	2.8	1.0	9.0	<1.0	0.006	0.006	<0.002	<0.002	0.26		2.0	4.3	5.3	-83.9	4.3	6.32	0.00	0.00	0.00	0.04	0.04	0.30	0.05	0.33	0.00	0.00	0.01	0.12	0.87
BDC-05-09	11/6/2017		2272	-4	<0.2	<0.2	<0.2	1.2	<1.0	8.7	<1.0	0.005	0.005	<0.002	<0.002	0.72		2.2	0.65	4.4	-17.5	3.6	6.51	0.00	0.00	0.00	0.02	0.00	0.29	0.02	0.29	0.00	0.00	0.00	0.06	0.94
BDC-05-10 (IW)	7/31/2011		-18		39	26	12	<1.0	<1.1	<1.2	<1.1	0.002	0.002	<0.002	<0.002	1.41	<0.1	2.0	19.7	0.3	76	4.5	6.84	0.24	0.20	0.12	0.00	0.00	0.00	0.56	0.00	0.42	0.36	0.22	0.00	0.00
	11/2/2011		76		22	27	1.0	<1.0	1.6	1.7	<1.1	0.038	0.037	0.008	0.004	2.43	<0.1	2.2	10.9	0.1	-38	2030	5.72	0.13	0.21	0.01	0.00	0.06	0.06	0.35	0.11	0.29	0.44	0.02	0.00	0.25
	5/6/2012		262		<1.0	<1.0	120	5.4	1.1	<1.0	<1.0	0.052	0.048	0.012	<0.002	0.02		1.7	0.4	19.0	58	270	6.48	0.00	0.00	0.124	0.09	0.04	0.00	1.32	0.04	0.00	0.00	0.91	0.06	0.03
BDC-05-10	11/15/2012		455		<1.0	<1.0	4.4	49	8.5	<1.0	<1.0	0.069	0.060	0.003	<0.002	0.02		1.0	<0.3	24.0	-11	122	6.63	0.00	0.00	0.05	0.78	0.30	0.00	0.83	0.30	0.00	0.00	0.04	0.69	0.27
BDC-05-10	5/22/2013		643		<0.2	<0.2	0.3	11	14	<3.0	<1.0	0.056	0.053	0.003	<0.002	0.25		1.2	0.49	20.0	-308	50.8	7.84	0.00	0.00	0.00	0.18	0.50	0.00	0.18	0.50	0.00	0.00	0.26	0.74	
BDC-05-10	11/13/2013		818		<0.2	<0.2	0.6	15	17	<1.0	<1.0	0.058	0.052	<0.002	<0.002	3.33		1.8	<0.30	23.0	-263	54.1	6.55	0.00	0.00	0.01	0.24	0.61	0.00	0.25	0.61	0.00	0.00	0.01	0.28	0.71
BDC-05-10	5/13/2014		999		<0.2	<0.2	0.2	5.1	29	<1.0	<1.0	0.037	0.034	<0.002	<0.002	3.87		1.6	<0.30	21.0	-196	27.6	6.53	0.00	0.00	0.00	0.08	1.03	0.00	0.08	1.03	0.00	0.00	0.00	0.07	0.93
BDC-05-10	11/10/2014		1180		<0.2	<0.2	0.2	3.9	3.4	<1.0	<1.0	0.040	0.038	<0.002	<0.002	0.03		1.0	<0.30	16.0	-86	19.3	6.25	0.00	0.00	0.00	0.06	0.12	0.00	0.06	0.12	0.00	0.00	0.01	0.34	0.65
BDC-05-10	4/27/2015		1348		<0.2	<0.2	<0.2	2.9	7.2	8.3	<1.0	0.026	0.024	0.003	<0.002	0.04		0.8	<0.30	14.0	-68	10.3	6.24	0.00	0.00	0.00	0.05	0.26	0.28	0.05	0.53	0.00	0.00	0.00	0.08	0.92
BDC-05-10	10/28/2015		1532		<0.2	<0.2	<0.2	0.7	<1.0	3.2	<1.0	0.021	0.019	<0.002	<0.002	0.17		1.0	<0.30	7.4	-14	7.8	6.42	0.00	0.00	0.00	0.01	0.00	0.11	0.01	0.11	0.00	0.00	0.00	0.10	0.90
BDC-05-10	4/20/2016		1707		<0.2	<0.2	<0.2	1.8	3.9	11	<1.0	0.015	0.016	<0.002	<0.002	0.22		1.1	0.65	5.8	-17	5.0	6.22	0.00	0.00	0.00	0.03	0.14	0.37	0.03	0.50	0.00	0.00	0.00	0.05	0.95
BDC-05-10	11/2/2016		1903		<0.2	<0.2	<0.2	0.8	<1.0	19	<1.0	0.022	0.021	<0.002	<0.002	0.15		0.6	<0.30	6.1	-109	7.5	6.34	0.00	0.00	0.00	0.01	0.00	0.63	0.01	0.63	0.00	0.00	0.00	0.02	0.98
BDC-05-10	5/4/2017		2086		<0.2	<0.2	0.3	1.8	1.0	15	<1.0	0.015	0.014	<0.002	<0.002	0.23		2.0	1.7	4.0	-89.7	6.0	6.38	0.00	0.00	0.00	0.03	0.04	0.50	0.03	0.53	0.00	0.00	0.01	0.05	0.94
BDC-05-10	11/6/2017		2272	-4	<0.2	<0.2	<0.2	0.6	<1.0	12	<1.0	0.014	0.011	<0.002	<0.002	0.32		2.0	1.3	6.2	8.90	5.3	6.37	0.00	0.00	0.00	0.01	0.00	0.40	0.01	0.40	0.00	0.00	0.00	0.02	0.98
BDC-05-11 (IW)	7/31/2011		-18		16	19	5.8	<1.0	<1.1	<1.2	<1.1	0.005	0.005	<0.002	<0.002	1.41	<0.1	2.0	4.0	1.4	65	3.9	6.93	0.10	0.14	0.06	0.00	0.00	0.00	0.30	0.00	0.32	0.48	0.20	0.00	0.00
	11/2/2011		76		9.6	20	12	<1.0	<1.1	<1.2	<1.1	0.039	0.037	0.013	0.004	2.16	<0.1	1.8	<1.0	1.0	-38	1330	5.72	0.06	0.15	0.12	0.00	0.00	0.00	0.33	0.00	0.17	0.46	0.37	0.00	0.00
	5/6/2012		262		0.2	0.5	44	7.2	1.6	<1.0	<1.0	0.038	0.034	0.009	0.002	0.01		1.4	0.5	18.0	70	284	6.42	0.00	0.00	0.45	0.12	0.06	0.00	0.57	0.06	0.00	0.01</			

Table 1
Groundwater Data Summary
Boeing Developmental Center
SWMU-17

Well	Date	Pilot Injection Elapsed Time From Injection (days)	Full Injection #1 Elapsed Time From Injection (days)	Full Injection #2 Elapsed Time From Injection (days)	Volatile Organic Compounds							Metals				Aquifer Redox Conditions					Donor Indicators		VOCs- micromoles/Liter (b)							Molar Fraction (c)								
					PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	As, Tot (mg/L)	As, Dis (mg/L)	Cu, Tot (mg/L)	Cu, Dis (mg/L)	DO (mg/L)	Nitrate (mg-N/L)	Iron II (mg/L)	Sulfate (mg/L)	Methane (mg/L)	ORP (mV)	TOC (mg/L)	pH	PCE	TCE	cDCE	VC	Ethene	Ethane	Total Chloroethenes (d)		Ethene + Ethane	PCE	TCE	cDCE	VC	Ethene + Ethane	
					5.3	1.4	134	2.4	NA	NA	NA	0.008	0.008	0.008	0.008																							
BDC-05-12	5/4/2017		2086		<0.2	<0.2	<0.2	0.3	<1.0	2.4	<1.0	0.010	0.009	<0.002	<0.002	0.22		2.2	<0.30	11.0	-94.4	8.1	6.33	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08	0.00	0.00	0.00	0.06	0.94	
BDC-05-12	8/1/2017		2175		<0.2	<0.2	<0.2	<0.2	<1.0	8.0	<1.0	0.011	0.009	<0.002	<0.002	0.08		2.3	<0.30	9.5	-85.0	7.6	6.08	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.27	0.00	0.00	0.00	0.00	1.00	
BDC-05-12	11/6/2017		2272	-4	<0.2	<0.2	<0.2	0.2	<1.0	1.6	<1.0	0.005	0.005	<0.002	<0.002	0.66		3.0	<0.30	12.0	-18.5	7.0	6.41	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.06	0.94		
BDC-05-13 (IW)	7/31/2011		-18		5.2	6.6	2.6	<1.0	<1.1	<1.2	<1.1	0.003	0.002	0.002	<0.002	1.73	<0.1	2.0	2.3	5.0	-1	6.0	7.06	0.03	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.29	0.46	0.25	0.00	0.00
	11/1/2011		75		<1.0	1.2	39	<1.0	<1.1	<1.2	<1.1	0.068	0.064	0.017	0.003	1.82	<1.0	1.5	<1.0	2.2	-70	550	6.65	0.00	0.01	0.40	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.02	0.98	0.00	0.00	
	5/6/2012		262		<0.2	<0.2	13	3.9	1.7	<1.0	<1.0	0.051	0.046	0.003	<0.002	0.03		3.0	0.4	19.0	78	34.2	6.40	0.00	0.00	0.13	0.06	0.06	0.00	0.20	0.06	0.00	0.00	0.52	0.24	0.24	0.00	
	11/15/2012		455		<1.0	<1.0	<1.0	2.3	3.7	<1.0	<1.0	0.060	0.055	<0.002	<0.002	0.04		2.2	<0.3	22.0	-9	30.2	6.75	0.00	0.00	0.00	0.04	0.13	0.00	0.04	0.13	0.00	0.00	0.00	0.22	0.78		
	5/22/2013		643		<0.2	<0.2	0.3	1.2	3.8	3.9	<1.0	0.019	0.019	<0.002	<0.002	0.29		1.8	0.43	23.0	-296	21.4	7.76	0.00	0.00	0.00	0.02	0.14	0.13	0.02	0.27	0.00	0.00	0.01	0.07	0.92		
	11/13/2013		818		<0.2	<0.2	0.3	2.1	3.6	6.4	<1.0	0.031	0.027	<0.002	<0.002	3.20		1.6	0.31	19.0	-241	24.7	6.59	0.00	0.00	0.00	0.03	0.13	0.21	0.04	0.34	0.00	0.00	0.01	0.09	0.90		
	5/12/2014		998		<0.2	<0.2	<0.2	2.6	4.3	6.8	<1.0	0.032	0.032	<0.002	<0.002	4.73		2.4	<0.30	19.0	-238	23.4	6.69	0.00	0.00	0.00	0.04	0.15	0.23	0.04	0.38	0.00	0.00	0.00	0.10	0.90		
	11/10/2014		1180		<0.2	<0.2	0.2	2.5	2.1	2.2	<1.0	0.020	0.019	<0.002	<0.002	0.02		1.0	0.33	7.1	-123	15.1	6.41	0.00	0.00	0.00	0.04	0.07	0.07	0.04	0.15	0.00	0.00	0.01	0.21	0.78		
	4/27/2015		1348		<0.2	<0.2	<0.2	1.9	2.5	1.6	<1.0	0.019	0.018	<0.002	<0.002	0.09		0.8	<0.30	12.0	-102	8.9	6.45	0.00	0.00	0.00	0.03	0.09	0.05	0.03	0.14	0.00	0.00	0.00	0.18	0.82		
	10/28/2015		1532		<0.2	<0.2	<0.2	1.1	<1.0	1.0	<1.0	0.020	0.019	<0.002	<0.002	0.20		1.2	<0.30	6.1	-32	10.8	6.54	0.00	0.00	0.00	0.02	0.00	0.03	0.02	0.03	0.00	0.00	0.00	0.35	0.65		
	4/20/2016		1707		<0.2	<0.2	<0.2	2.0	1.9	2.0	<1.0	0.026	0.024	<0.002	<0.002	0.10		1.0	<0.30	10.0	-36	7.6	6.60	0.00	0.00	0.00	0.03	0.07	0.07	0.03	0.13	0.00	0.00	0.00	0.19	0.81		
	11/3/2016		1904		<0.2	<0.2	<0.2	1.0	<1.0	2.3	<1.0	0.023	0.020	<0.002	<0.002	0.08		1.0	<0.30	15.0	-140.9	12.2	6.32	0.00	0.00	0.00	0.02	0.00	0.08	0.02	0.08	0.00	0.00	0.00	0.17	0.83		
	5/4/2017		2086		<0.2	<0.2	<0.2	1.1	1.4	12	<1.0	0.027	0.027	<0.002	<0.002	0.17		2.4	<0.30	14.0	-123.1	11.6	6.42	0.00	0.00	0.00	0.02	0.05	0.40	0.02	0.45	0.00	0.00	0.00	0.04	0.96		
	11/6/2017		2272	-4	<0.2	<0.2	<0.2	1.1	<1.0	7.0	<1.0	0.030	0.030	<0.002	<0.002	0.36		1.8	<0.30	14.0	-28.5	18.5	6.53	0.00	0.00	0.00	0.02	0.00	0.23	0.02	0.23	0.00	0.00	0.00	0.07	0.93		
BDC-05-14 (IW)	7/31/2011		-18		2.8	6.8	2.8	<1.0	<1.1	<1.2	<1.1	0.004	0.004	0.004	<0.002	1.76	<0.1	2.0	10.1	6.5	-15	8.6	7.00	0.02	0.05	0.03	0.00	0.00	0.00	0.10	0.00	0.17	0.53	0.30	0.00	0.00		
	11/1/2011		75		2.5	6.7	13	<1.0	<1.1	<1.2	<1.1	0.083	0.074	0.022	0.002	1.87	<1.0	2.3	<1.0	4.0	-124	725	6.13	0.02	0.05	0.13	0.00	0.00	0.00	0.20	0.00	0.08	0.25	0.67	0.00	0.00		
	5/6/2012		262		<0.2	0.4	3.0	1.1	<1.0	<1.0	<1.0	0.012	0.009	<0.002	<0.002	0.08		1.7	0.6	23.0	99	41.5	6.33	0.00	0.00	0.03	0.02	0.00	0.00	0.05	0.00	0.00	0.06	0.60	0.34	0.00		
	11/15/2012		455		<0.2	<0.2	1.1	2.0	1.4	<1.0	<1.0	0.022	0.019	<0.002	<0.002	0.11		2.2	<0.3	24.0	-1.4	39.9	6.66	0.00	0.00	0.01	0.03	0.05	0.00	0.04	0.05	0.00	0.00	0.12	0.34	0.54		
	5/22/2013		643		<0.2	<0.2	0.2	1.3	1.3	<3.0	<1.0	0.012	0.012	<0.002	<0.002	0.40		1.8	<0.3	26.0	-311	26.3	7.69	0.00	0.00	0.00	0.02	0.05	0.00	0.02	0.05	0.00	0.03	0.30	0.67			
	11/13/2013		818		<0.2	<0.2	0.2	1.2	1.3	2.5	<1.0	0.017	0.015	<0.002	<0.002	3.80		1.5	<0.30	24.0	-219	29.5	6.44	0.00	0.00	0.00	0.02	0.05	0.08	0.02	0.13	0.00	0.00	0.01	0.13	0.86		
	5/12/2014		998		<0.2	<0.2	0.2	1.5	2.2	5.0	<1.0	0.018	0.021	<0.002	<0.002	5.21		2.0	<0.30	22.0	-233	30.2	6.55	0.00	0.00	0.00	0.02	0.08	0.17	0.03	0.24	0.00	0.00	0.01	0.09	0.90		
	11/10/2014		1180		<0.2	<0.2	0.4	5.1	4.3	6.4	<1.0	0.017	0.017	<0.002	<0.002	0.15		1.2	2.3	19.0	-97	21.3	6.35	0.00	0.00	0.00	0.08	0.15	0.21	0.09	0.37	0.00	0.00	0.01	0.18	0.81		
	4/27/2015		1348		<0.2	<0.2	0.4	1.6	<1.0	1.1	<1.0	0.018	0.015	<0.002	<0.002	0.11		1.4	1.8	11.0	-88	18.9	6.25	0.00	0.00	0.00	0.03	0.00	0.04	0.03	0.04	0.00	0.00	0.06	0.39	0.55		
	10/28/2015		1532		<0.2	<0.2	0.3	1.4	1.1	2.4	<1.0	0.015	0.013	<0.002	<0.002	0.11		1.0	0.46	12.0	-28	21.0	6.47	0.00	0.00	0.00	0.02	0.04	0.08	0.03	0.12	0.00	0.00	0.02	0.15	0.82		
	4/20/2016		1707		<0.2	<0.2	0.3	0.9	<1.0	1.7	<1.0	0.016	0.016	<0.002	<0.002	0.11		2.0	3.1	11.0	-42	22.3	6.71	0.00	0.00	0.00	0.01	0.00	0.06	0.02	0.06	0.00	0.00	0.04	0.19	0.76		
	11/3/2016		1904		<0.2	<0.2	<0.2	<0.2	<1.0	<1.0	<1.0	0.007	0.007	<0.002	<0.002	0.32		2.6	<0.30	17.0	-111	16.0	6.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	5/4/2017		2086		<0.2	<0.2	0.3	1	<2.0	8.9	<1.0	0.023	0.021	<0.002	<0.002	0.17		2.2	3.8	12.0	-125.1	21.8	6.45	0.00	0.00	0.00	0.02	0.00	0.30	0.02	0.30	0.00	0.00	0.01	0.05	0.94		
	11/6/2017		2272	-4	<0.2	<0.2	<0.2	0.7	<1.0	3.6	<1.0	0.020	0.020	<0.002	<0.002	0.31		2.8	3.8	14.0	-27.6	19.2	6.48	0.00	0.00	0.00	0.01	0.00	0.12	0.01								

Table 1
Groundwater Data Summary
Boeing Developmental Center
SWMU-17

Well	Date	Pilot Injection Elapsed Time From Injection (days)	Full Injection #1 Elapsed Time From Injection (days)	Full Injection #2 Elapsed Time From Injection (days)	Volatile Organic Compounds							Metals				Aquifer Redox Conditions					Donor Indicators		VOCs- micromoles/Liter (b)							Molar Fraction (c)							
					PCE (µg/L)	TCE (µg/L)	cDCE (µg/L)	VC (µg/L)	Ethene (µg/L)	Ethane (µg/L)	Acetylene (µg/L)	As, Tot (mg/L)	As, Dis (mg/L)	Cu, Tot (mg/L)	Cu, Dis (mg/L)	DO (mg/L)	Nitrate (mg-N/L)	Iron II (mg/L)	Sulfate (mg/L)	Methane (mg/L)	ORP (mV)	TOC (mg/L)	pH	PCE	TCE	cDCE	VC	Ethene	Ethane	Total Chloroethenes (d)	Ethene + Ethane	PCE	TCE	cDCE	VC	Ethene + Ethane	
					5.3	1.4	134	2.4	NA	NA	NA	0.008	0.008	0.008	0.008	0.02	1.6	<0.30	15.0	-75.1	16.9	6.57	0.00	0.00	0.00	0.01	0.04	0.40	0.01	0.43	0.00	0.00	0.00	0.03	0.97		
BDC-05-16	8/9/2016		1818		<0.2	<0.2	<0.2	0.9	1.0	12	<1.0	0.033	0.033	<0.002	<0.002	-0.02	1.6	<0.30	15.0	-75.1	16.9	6.57	0.00	0.00	0.00	0.01	0.04	0.40	0.01	0.43	0.00	0.00	0.00	0.03	0.97		
BDC-05-16	11/3/2016		1904		<0.2	<0.2	<0.2	0.6	<1.0	6.9	<1.0	0.022	0.021	<0.002	<0.002	0.32	1.6	<0.30	13.0	-90.8	13.0	6.13	0.00	0.00	0.00	0.01	0.04	0.23	0.01	0.23	0.00	0.00	0.00	0.04	0.96		
BDC-05-16	2/8/2017		2001		<0.2	<0.2	<0.2	0.8	<1.0	6.7	<1.0	0.033	0.032	<0.002	<0.002	0.29	2.4	<0.30	10.0	-51.1	17.7	6.62	0.00	0.00	0.00	0.01	0.00	0.22	0.01	0.22	0.00	0.00	0.00	0.05	0.95		
BDC-05-16	5/4/2017		2086		<0.2	<0.2	<0.2	1.3	1.6	12	<1.0	0.029	0.027	<0.002	<0.002	0.15	2.0	<0.30	9.1	-95.8	17.0	6.34	0.00	0.00	0.00	0.02	0.06	0.40	0.02	0.46	0.00	0.00	0.00	0.04	0.96		
BDC-05-16	8/1/2017		2175		<0.2	<0.2	<0.2	0.5	<1.0	9.9	<1.0	0.031	0.029	0.003	<0.002	0.05	2.0	<0.30	7.4	-104	12.7	6.12	0.00	0.00	0.00	0.01	0.00	0.33	0.01	0.33	0.00	0.00	0.00	0.02	0.98		
BDC-05-16	11/7/2017		2273	-3	<0.2	<0.2	<0.2	0.7	<1.0	4.0	<1.0	0.021	0.020	<0.002	<0.002	0.41	2.8	<0.30	9.5	-5.0	11.6	6.48	0.00	0.00	0.00	0.01	0.00	0.13	0.01	0.13	0.00	0.00	0.00	0.08	0.92		
BDC-05-17 (IW)	7/31/2011		-18		11	22	34	<1.0	<1.1	<1.2	<1.1	0.004	0.004	0.003	0.002	2.03	0.6	1.5	16.0	0.30	59	10.2	6.95	0.07	0.17	0.35	0.00	0.00	0.00	0.58	0.00	0.11	0.29	0.60	0.00	0.00	
	11/1/2011		75		3.2	4.8	5.1	<1.0	<1.1	<1.2	<1.1	0.053	0.047	0.005	<0.002	2.61	<1.0	2.4	23.9	2.8	-50	3500	5.74	0.02	0.04	0.05	0.00	0.00	0.00	0.11	0.00	0.18	0.34	0.49	0.00	0.00	
	5/6/2012		262		<2.0	<2.0	9.3	5.6	<1.0	<1.0	<1.0	0.058	0.026	0.003	<0.002	0.24	2.0	0.7	15.0	182	839	6.08	0.00	0.00	0.10	0.09	0.00	0.00	0.19	0.00	0.00	0.00	0.52	0.48	0.00	0.00	
BDC-05-17	11/15/2012		455		<5.0	<5.0	<5.0	5.4	2.0	<1.0	<1.0	0.081	0.062	<0.002	<0.002	0.02	1.0	<0.3	23.0	13	73.5	6.62	0.00	0.00	0.00	0.09	0.07	0.00	0.09	0.00	0.00	0.00	0.55	0.45	0.00	0.00	
BDC-05-17	5/23/2013		644		<0.2	<0.2	0.7	5.1	4.3	<3.0	<1.0	0.142	0.062	<0.002	<0.002	0.44	1.2	<0.3	26.0	-259	45.8	7.54	0.00	0.00	0.01	0.08	0.15	0.00	0.09	0.15	0.00	0.00	0.03	0.34	0.63	0.00	0.00
BDC-05-17	11/13/2013		818		<0.2	<0.2	0.5	4.0	3.0	2.2	<1.0	0.057	0.037	<0.002	<0.002	2.21	2.0	<0.30	26.0	-266	49.8	6.57	0.00	0.00	0.01	0.06	0.11	0.07	0.07	0.18	0.00	0.00	0.02	0.26	0.72	0.00	0.00
BDC-05-17	5/12/2014		998		<0.2	<0.2	0.4	3.2	2.5	6.0	<1.0	0.038	0.033	<0.002	<0.002	4.60	1.8	<0.30	25.0	-368	44.1	6.64	0.00	0.00	0.00	0.05	0.09	0.20	0.06	0.29	0.00	0.00	0.01	0.15	0.84	0.00	0.00
BDC-05-17	11/11/2014		1181		<0.2	<0.2	0.3	2.7	3.9	5.9	<1.0	0.038	0.036	<0.002	<0.002	0.06	2.0	0.74	26.0	-123	52.0	6.35	0.00	0.00	0.00	0.04	0.14	0.20	0.05	0.34	0.00	0.00	0.01	0.11	0.88	0.00	0.00
BDC-05-17	4/26/2015		1347		<0.2	<0.2	0.2	1.5	2.7	3.0	<1.0	0.039	0.032	0.004	<0.002	0.25	1.4	<0.30	21.0	-127	29.0	6.44	0.00	0.00	0.00	0.02	0.10	0.10	0.03	0.20	0.00	0.00	0.01	0.11	0.88	0.00	0.00
BDC-05-17	10/27/2015		1531		<0.2	<0.2	0.2	1.6	1.0	4.5	<1.0	0.037	0.036	<0.002	<0.002	0.12	1.5	<0.30	21.0	-47	32.0	6.38	0.00	0.00	0.00	0.03	0.04	0.15	0.03	0.19	0.00	0.00	0.01	0.12	0.87	0.00	0.00
BDC-05-17	4/20/2016		1707		<0.2	<0.2	<0.2	1	1.1	6.6	<1.0	0.042	0.036	0.003	<0.002	0.44	0.8	<0.30	19.0	-77	29.0	6.84	0.00	0.00	0.00	0.02	0.04	0.22	0.02	0.26	0.00	0.00	0.00	0.06	0.94	0.00	0.00
BDC-05-17	11/3/2016		1904		<0.2	<0.2	<0.2	0.9	<1.0	7.6	<1.0	0.041	0.035	<0.002	<0.002	0.45	1.0	<0.30	19.0	-118.8	19.9	6.23	0.00	0.00	0.00	0.01	0.00	0.25	0.01	0.25	0.00	0.00	0.00	0.05	0.95	0.00	0.00
BDC-05-17	5/4/2017		2086		<0.2	<0.2	<0.2	0.9	<2.0	13	<1.0	0.044	0.037	<0.002	<0.002	0.14	1.0	<0.30	11.0	-110.4	19.2	6.29	0.00	0.00	0.00	0.01	0.00	0.43	0.01	0.43	0.00	0.00	0.00	0.03	0.97	0.00	0.00
BDC-05-17	11/7/2017		2273	-3	<0.2	<0.2	<0.2	0.8	<1.0	7.6	<1.0	0.033	0.033	<0.002	<0.002	0.47	1.8	<0.30	11.0	-2.7	15.8	6.52	0.00	0.00	0.00	0.01	0.00	0.25	0.01	0.25	0.00	0.00	0.00	0.05	0.95	0.00	0.00
BDC-05-18 (MW 12 ft XG)	7/31/2011		-18		3.6	5.0	6.6	<1.0	<1.1	<1.2	<1.1	0.019	0.020	<0.002	<0.002	1.57	<0.1	2.4	4.5	3.9	-19	3.2	7.13	0.02	0.04	0.07	0.00	0.00	0.00	0.13	0.00	0.17	0.30	0.53	0.00	0.00	
	11/1/2011		75		2.8	4.0	7.6	<1.0	<1.1	<1.2	<1.1	0.019	0.020	0.003	0.003	1.37	<0.1	1.2	1.2	4.3	-106	21.7	6.88	0.02	0.03	0.08	0.00	0.00	0.00	0.13	0.00	0.13	0.24	0.62	0.00	0.00	
	2/19/2012		185		1.8	3.7	12	<0.2	<1.0	<1.0	<1.0					0.19	<0.5	2.2	<1.5	11.0	9	2.7	6.66	0.01	0.03	0.12	0.00	0.00	0.00	0.16	0.00	0.07	0.17	0.76	0.00	0.00	
BDC-05-18	5/6/2012		262		2.0	4.0	9.6	<0.2	<1.0	<1.0	<1.0	0.013	0.013	<0.002	<0.002	0.21	2.5	2.1	7.5	132	2.5	6.39	0.01	0.03	0.10	0.00	0.00	0.00	0.14	0.00	0.09	0.22	0.70	0.00	0.00	0.00	
BDC-05-18	9/5/2012		384		1.5	3.1	11	0.2	<1.0	<1.0	<1.0					0.13	1.5	2.0	7.9	58	1.8	6.91	0.01	0.02	0.11	0.00	0.00	0.00	0.15	0.00	0.06	0.16	0.76	0.02	0.00	0.00	
BDC-05-18	11/15/2012		455		1.0	4.3	16	<0.5	<1.0	<1.0	<1.0	0.015	0.014	<0.002	<0.002	0.48	1.4	2.4	8.3	25	1.7	6.62	0.01	0.03	0.17	0.00	0.00	0.00	0.20	0.00	0.03	0.16	0.81	0.00	0.00	0.00	
BDC-05-18	2/25/2013		557		2.0	4.6	5.7	<0.2	<1.0	<1.0	<1.0					0.25	2.0	9.2	1.3	72	2.0	6.53	0.01	0.04	0.06	0.00	0.00	0.00	0.11	0.00	0.11	0.33	0.56	0.00	0.00	0.00	
BDC-05-18	5/23/2013		644		3.1	5.2	4.1	<0.2	<1.0	<1.0	<1.0	0.014	0.014	<0.002	<0.002	0.30	1.5	7.0	1.0	-262	1.3	7.24	0.02	0.04	0.04	0.00	0.00	0.00	0.10	0.00	0.19	0.39	0.42	0.00	0.00	0.00	
BDC-05-18	8/28/2013		741		2.2	3.7	7.4	<0.2	<1.0	<1.0	<1.0					0.76	1.6	4.1	1.5	-309	2.2	6.25	0.01	0.03	0.08	0.00	0.00	0.00	0.12	0.00	0.11	0.24	0.65	0.00	0.00	0.00	
BDC-05-18	11/14/2013		819		1.2	1.8	1.4	0.2	<1.0	<1.0	<1.0	0.006	0.002	<0.002	<0.002	2.53	1.0	4.7	0.68	-164	<1.0	7.03	0.01	0.01	0.01	0.00	0.00	0.00	0.04	0.00	0.19	0.36	0.37	0.08	0.00	0.00	
BDC-05-18	2/11/																																				

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Boeing Developmental Center
SWMU-17

Well	Date	Pilot Injection Elapsed Time From Injection (days)	Full Injection #1 Elapsed Time From Injection (days)	Full Injection #2 Elapsed Time From Injection (days)	Volatile Organic Compounds							Metals				Aquifer Redox Conditions					Donor Indicators		VOCs- micromoles/Liter (b)							Molar Fraction (c)							
					PCE	TCE	cDCE	VC	Ethene	Ethane	Acetylene	As, Tot	As, Dis	Cu, Tot	Cu, Dis	DO	Nitrate	Iron II	Sulfate	Methane	ORP	TOC	pH	PCE	TCE	cDCE	VC	Ethene	Ethane	Total Chloroethenes (d)	Ethene + Ethane	PCE	TCE	cDCE	VC	Ethene + Ethane	
					(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Proposed Groundwater Cleanup Levels (a)					5.3	1.4	134	2.4	NA	NA	NA	0.008	0.008	0.008	0.008																						
BDC-05-19	8/9/2016		1818		<0.2	<0.2	<0.2	0.4	<1.0	3.9	<1.0	0.015	0.014	<0.002	<0.002	0.31		1.5	0.6	17.0	-109.1	12.2	6.07	0.00	0.00	0.00	0.01	0.00	0.13	0.01	0.13	0.00	0.00	0.00	0.05	0.95	
BDC-05-19	11/3/2016		1904		<0.2	<0.2	<0.2	0.2	<1.0	<1.0	<1.0	0.012	0.010	<0.002	<0.002	0.08		2.6	0.30	18.0	-116.1	12.9	6.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	
BDC-05-19	2/8/2017		2001		<0.2	<0.2	<0.2	0.3	<1.0	3.2	<1.0	0.023	0.011	0.003	<0.002	0.34		3.2	0.32	16.0	-33.3	12.1	6.54	0.00	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.04	0.00	0.00	0.96	
BDC-05-19	5/4/2017		2086		<0.2	<0.2	<0.2	0.4	<1.0	2.3	<1.0	0.020	0.013	<0.002	<0.002	0.24		1.8	0.43	13.0	-96	11.6	6.26	0.00	0.00	0.00	0.01	0.00	0.08	0.01	0.08	0.00	0.00	0.08	0.00	0.92	
BDC-05-19	8/1/2017		2175		<0.2	<0.2	<0.2	0.2	<1.0	9.3	<1.0	0.017	0.012	<0.002	<0.002	0.11		2.2	<0.30	15.0	-98.0	10.2	6.21	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31	0.00	0.00	0.00	0.01	0.99	
BDC-05-19	11/6/2017		2272	-4	<0.2	<0.2	<0.2	<0.2	<1.0	1.5	<1.0	0.006	0.004	<0.002	<0.002	0.55		3.0	0.45	15.0	-19.6	9.3	6.46	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	1.00	
BDC-05-20 (MW 31 ft DG)	7/31/2011		-18		<1.0	7.0	45	<1.0	<1.1	<1.2	<1.1	0.011	0.011	<0.002	<0.002	2.33	<0.1	1.5	7.4	0.2	-42	10.8	7.12	0.00	0.05	0.46	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.10	0.90	0.00	0.00
	11/3/2011		77		<1.0	5.7	25	1.0	<1.1	<1.2	<1.1	0.010	0.011	<0.002	<0.002	1.54	<0.1	1.0	6.0	4.6	11	8.3	7.14	0.00	0.04	0.26	0.02	0.00	0.00	0.32	0.00	0.00	0.14	0.81	0.05	0.00	
	2/19/2012		185		<0.2	2.9	17	2.5	<1.0	<1.0	<1.0					0.35	<0.5	1.5	<1.5	16.0	31	8.2	6.69	0.00	0.02	0.18	0.04	0.00	0.00	0.24	0.00	0.00	0.09	0.74	0.17	0.00	
BDC-05-20	5/7/2012		263		<0.2	1.8	14	2.2	<1.0	<1.0	<1.0	0.011	0.011	<0.002	<0.002	0.69		1.8	2.3	20.0	20	11.1	6.66	0.00	0.01	0.14	0.04	0.00	0.00	0.19	0.00	0.00	0.07	0.75	0.18	0.00	
BDC-05-20	9/5/2012		384		<0.4	<0.4	12	2.0	<1.0	<1.0	<1.0				0.08		1.4	<0.3	14.0	67	12.1	6.75	0.00	0.00	0.12	0.03	0.00	0.00	0.16	0.00	0.00	0.00	0.79	0.21	0.00		
BDC-05-20	11/16/2012		456		<0.5	0.6	17	3.5	<1.0	<1.0	<1.0	0.012	0.013	<0.002	<0.002	0.07		2.0	<0.3	18.0	0.9	13.1	6.88	0.00	0.00	0.18	0.06	0.00	0.00	0.24	0.00	0.00	0.02	0.74	0.24	0.00	
BDC-05-20	2/26/2013		558		<0.2	0.5	9.8	6.1	<1.0	<1.0	<1.0				0.16		1.5	<0.3	22.0	16	16.3	6.86	0.00	0.00	0.10	0.10	0.00	0.00	0.20	0.00	0.00	0.02	0.50	0.48	0.00		
BDC-05-20	5/23/2013		644		<0.2	0.4	10	8.1	1.5	<1.0	<1.0	0.016	0.017	<0.002	<0.002	0.25		1.2	<0.3	25.0	-233	16.9	7.55	0.00	0.00	0.10	0.13	0.05	0.00	0.24	0.05	0.00	0.01	0.36	0.45	0.18	
BDC-05-20	8/28/2013		741		<0.2	0.2	6.5	10	2.1	<1.0	<1.0				2.38		2.6	<0.30	20.0	-317	15.4	6.70	0.00	0.00	0.07	0.16	0.07	0.00	0.23	0.00	0.01	0.22	0.53	0.25			
BDC-05-20	11/14/2013		819		<0.2	0.3	8.1	8.8	2.2	<1.0	<1.0	0.021	0.021	<0.002	<0.002	2.26		1.4	<0.30	19.0	-287	17.9	6.77	0.00	0.00	0.08	0.14	0.08	0.00	0.23	0.08	0.00	0.01	0.27	0.46	0.26	
BDC-05-20	2/12/2014		909		<0.2	0.2	3.9	7.8	3.0	<4.0	<1.0				2.82		1.8	<0.30	16.0	-205	16.3	6.78	0.00	0.00	0.04	0.12	0.11	0.00	0.17	0.11	0.00	0.01	0.15	0.46	0.39		
BDC-05-20	5/13/2014		999		<0.2	0.2	3.8	6.3	2.0	<1.0	<1.0	0.017	0.017	<0.002	<0.002	3.44		1.6	0.36	16.0	-213	18.7	6.79	0.00	0.00	0.04	0.10	0.07	0.00	0.14	0.07	0.00	0.01	0.19	0.48	0.34	
BDC-05-20	8/6/2014		1084		<0.2	<0.2	1.3	7.5	2.1	2.0	<1.0				4.23		1.4	<0.30	12.0	-150	17.6	7.31	0.00	0.00	0.01	0.12	0.07	0.07	0.13	0.14	0.00	0.00	0.05	0.44	0.51		
BDC-05-20	11/10/2014		1180		<0.2	<0.2	0.7	4.9	3.0	3.6	<1.0	0.021	0.021	<0.002	<0.002	0.08		0.8	0.97	15.0	-117	15.9	6.50	0.00	0.00	0.01	0.08	0.11	0.12	0.09	0.23	0.00	0.00	0.02	0.25	0.73	
BDC-05-20	1/21/2015		1252		<0.2	<0.2	0.5	3.8	2.7	2.6	<1.0				0.27		1.0	0.59	13.0	-120	13.8	6.47	0.00	0.00	0.01	0.06	0.10	0.09	0.07	0.18	0.00	0.00	0.02	0.24	0.73		
BDC-05-20	4/26/2015		1347		<0.2	<0.2	0.4	6.9	4.8	1.6	<1.0	0.028	0.023		0.06		0.8	<0.30	14.0	-99	11.4	6.43	0.00	0.00	0.00	0.11	0.17	0.05	0.11	0.22	0.00	0.00	0.01	0.33	0.66		
BDC-05-20	7/21/2015		1433		<0.2	<0.2	0.2	2.7	4.5	3.0	<1.0				0.12		1.3	<0.30	17.0	-59	14.2	6.55	0.00	0.00	0.00	0.04	0.16	0.10	0.05	0.26	0.00	0.00	0.01	0.14	0.85		
BDC-05-20	10/27/2015		1531		<0.2	<0.2	<0.2	2.0	1.5	1.1	<1.0	0.028	0.028	<0.002	<0.002	0.23		1.4	<0.30	11.0	-35	10.6	6.47	0.00	0.00	0.00	0.03	0.05	0.04	0.03	0.09	0.00	0.00	0.00	0.26	0.74	
BDC-05-20	1/26/2016		1622		<0.2	<0.2	0.2	2.7	2.1	1.5	<1.0				0.26		1.3	<0.30	11.0	-109	9.9	6.63	0.00	0.00	0.00	0.04	0.07	0.05	0.05	0.12	0.00	0.00	0.01	0.25	0.73		
BDC-05-20	4/21/2016		1708		<0.2	<0.2	0.3	6.8	6.1	2.5	<1.0	0.034	0.030	<0.002	<0.002	0.38		0.8	<0.30	8.8	-44	16.2	6.63	0.00	0.00	0.00	0.11	0.22	0.08	0.11	0.30	0.00	0.00	0.01	0.26	0.73	
BDC-05-20	8/9/2016		1818		<0.2	<0.2	0.2	2.2	7.0	2.9	<1.0	0.030	0.028	<0.002	<0.002	-0.01		2.0	0.37	8.4	-82	12.9	6.62	0.00	0.00	0.00	0.04	0.25	0.10	0.04	0.35	0.00	0.00	0.01	0.09	0.90	
BDC-05-20	11/3/2016		1904		<0.2	<0.2	<0.2	1.4	5.2	2.5	<1.0	0.027	0.028	<0.002	<0.002	0.40		1.0	<0.30	8.9	-121.9	14.1	6.60	0.00	0.00	0.00	0.02	0.19	0.08	0.02	0.27	0.00	0.00	0.00	0.08	0.92	
BDC-05-20	2/8/2017		2001		<0.2	<0.2	<0.2	1.8	5.2	2.8	<1.0	0.029	0.030	<0.002	<0.002	0.39		2.8	<0.30	7.1	-44.2	13.0	6.61	0.00	0.00	0.00	0.03	0.19	0.09	0.03	0.28	0.00	0.00	0.00	0.09	0.91	
BDC-05-20	5/4/2017		2086		<0.2	<0.2	<0.2	1.2	2.3	4.3	<1.0	0.027	0.026	<0.002	<0.002	0.30		1.6	1.2	4.3	-99.6	12.9	6.55	0.00	0.00	0.00	0.02	0.08	0.14	0.02	0.22	0.00	0.00	0.00	0.08	0.92	
BDC-05-20	8/1/2017		2175		<0.2	<0.2	<0.2	0.9	1.4	4.6	<1.0	0.027	0.027	<0.002	<0.002	0.61		2.1	<0.30	6.4	-104.9	12.3	6.46														

Table 2
Bioremediation Groundwater Monitoring Matrix (Revised 5/2013)
Boeing Developmental Center
SMWU-17

	Quarterly	Semiannual	Explanation
Injection Wells			
02	(a) (b)	(a) (b) (c)	head of plume
07		(a) (b) (c)	location of former UST
09		(a) (b) (c)	core of plume
10		(a) (b) (c)	core of plume
11		(a) (b) (c)	core of plume
12	(a) (b)	(a) (b) (c)	core of plume
13		(a) (b) (c)	core of plume
14		(a) (b) (c)	core of plume
15		(a) (b) (c)	core of plume
16	(a) (b)	(a) (b) (c)	core of plume
17		(a) (b) (c)	core of plume
Monitoring Wells			
03		(a) (b) (c)	downgradient
04		(a) (c)	crossgradient
05		(a) (c)	upgradient
08		(a) (c)	crossgradient
18	(a) (b)	(a) (b) (c)	crossgradient
19	(a) (b)	(a) (b) (c)	downgradient
20	(a) (b)	(a) (b) (c)	downgradient
21	(a) (b)	(a) (b) (c)	crossgradient
22	(a)	(a) (c)	crossgradient
23	(a)	(a) (c)	downgradient
24	(a) (b)	(a) (b) (c)	crossgradient

UST = underground storage tank

- (a) Laboratory Parameters (method): Volatile Organic Compounds (VOCs) Short List (8260) - tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), vinyl chloride (VC), total organic carbon (TOC; SM5310C), sulfate (E300).
Field Parameters: Fe²⁺; pH, dissolved oxygen (DO), oxygen reduction potential (ORP), temperature.
- (b) Laboratory Parameters (method): Methane/Ethane/Ethene/Acetylene (RSK-175).
- (c) Laboratory Parameters (method): total (nonfiltered) and dissolved (field filtered) copper (3010A) and arsenic (200.8 ICP-MS).

NOTE: Changes to original monitoring matrix are shown in red.

**Table 3
November 2017 Electron Donor Injection Summary
Boeing Developmental Center
SWMU-17**

Well	Pre-Flush Volume (gal)	Donor Volume Injected (gal)	Post-Flush (gal)	Average Injection Rate (gpm)	Peak Pressure at Well (psi)
BDC-05-02	102	6,462	251	15	2
BDC-05-03	119	6,451	438	17	1
BDC-05-04	100	5,624	479	23	2
BDC-05-07	100	6,213	387	26	2.5
BDC-05-10	103	6,181	565	17	2
Totals/Averages	524	30,931	2,120	20	2

Total molasses injected = 37,240 lbs

Acronyms and Abbreviations:

- gal = gallons
- gpm = gallons per minute
- lbs = pounds
- psi = pounds per square inch

Table 4
Revised Bioremediation Groundwater Monitoring Matrix (10/2017)
Boeing Developmental Center
SMWU-17

BDC-05- Wells	Injected		Semiannual
	2011	2017	
Injection Wells			
02	X	X	(a) (b) (c)
07	X	X	(a) (b) (c)
09	X		(a) (b) (c)
10	X	X	(a) (b) (c)
11	X		(a) (b) (c)
12	X		(a) (b) (c)
13	X		(a) (b) (c)
14	X		(a) (b) (c)
15	X		(a) (b) (c)
16	X		(a) (b) (c)
17	X		(a) (b) (c)
Monitoring Wells			
03		X	(a) (b) (c)
04		X	(a) (b) (c)
05			(a) (b)
08			(a) (b)
18			(a) (b) (c)
19			(a) (b) (c)
20			(a) (b) (c)
21			(a) (b) (c)
22			(a) (b)
23			(a) (b)
24			(a) (b) (c)

- (a) Laboratory Parameters (method): VOC Short List (8260) - PCE, TCE, cDCE, VC; TOC (415.1); Sulfate (E300);
Field Parameters: Fe²⁺; pH, DO, ORP, Temp.
- (b) Laboratory Parameters (method): Total (nonfiltered) and dissolved (field filtered) Cu (3010A) and As (200.8 ICP-MS).
- (c) Laboratory Parameters (method): Methane/Ethane/Ethene/Acetylene (RSK-175).

Laboratory Reports

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Report Date: February 21, 2017

Project: Boeing_DC:SWMU-17 s-ann

Submittal Date: 02/08/2017

Group Number: 1763309

State of Sample Origin: WA

<u>Client Sample Description</u>	Lancaster Labs <u>(LL) #</u>
BDC-05-02-170207 Water	8825336
BDC-05-02-170207 Water	8825337
BDC-05-02-170207 Total Metals Water	8825338
BDC-05-02-170207 Total Metals Water	8825339
BDC-05-02-170207 Dissolved Metals Water	8825340
BDC-05-02-170207 Dissolved Metals Water	8825341
BDC-05-18-170207 Water	8825342
BDC-05-18-170207 Water	8825343
BDC-05-18-170207 Total Metals Water	8825344
BDC-05-18-170207 Total Metals Water	8825345
BDC-05-18-170207 Dissolved Metals Water	8825346
BDC-05-18-170207 Dissolved Metals Water	8825347
BDC-05-21-170207 Water	8825348
BDC-05-21-170207 Water	8825349
BDC-05-21-170207 Total Metals Water	8825350
BDC-05-21-170207 Total Metals Water	8825351
BDC-05-21-170207 Dissolved Metals Water	8825352
BDC-05-21-170207 Dissolved Metals Water	8825353
BDC-05-23-170207 Water	8825354
BDC-05-23-170207 Water	8825355
BDC-05-23-170207 Total Metals Water	8825356
BDC-05-23-170207 Total Metals Water	8825357
BDC-05-23-170207 Dissolved Metals Water	8825358
BDC-05-23-170207 Dissolved Metals Water	8825359
Trip Blank Water	8825360

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster->

[laboratories-environmental/resources/certifications/](#) . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To The Boeing Company
Electronic Copy To Landau

Attn: Lindsey E. Mahrt
Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364

Project Name: Boeing_DC:SWMU-17 s-ann
LL Group #: 1763309

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 200.8 rev 5.4, Metals**

Batch #: 170417050011A (Sample number(s): 8825352-8825353, 8825356-8825359 UNSPK: 8825357 BKG: 8825357)

The duplicate RPD for the following analyte(s) exceeded the acceptance window:
Copper

EPA 200.8 rev 5.4, Metals Dissolved

Batch #: 170417050011A (Sample number(s): 8825352-8825353, 8825356-8825359 UNSPK: 8825357 BKG: 8825357)

The duplicate RPD for the following analyte(s) exceeded the acceptance window:
Copper

EPA 300.0, Wet Chemistry

Batch #: 17040120901A (Sample number(s): 8825343 UNSPK: P815632 BKG: P815632)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Sulfate

Batch #: 17044987131B (Sample number(s): 8825349 UNSPK: P826550 BKG: P826550)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Sulfate

SM 5310 C-2000, Wet Chemistry

Batch #: 17045667605A (Sample number(s): 8825336 UNSPK: P826659 BKG: P826659)

The duplicate RPD for the following analyte(s) exceeded the acceptance window:
Total Organic Carbon

Batch #: 17045667605B (Sample number(s): 8825342, 8825348, 8825354 UNSPK: P828102 BKG: P828102)

The duplicate RPD for the following analyte(s) exceeded the acceptance window:
Total Organic Carbon

Sample Description: BDC-05-02-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825336
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 11:21 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

0502-

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.5	0.2	1
11996	Tetrachloroethene	127-18-4	2.1	0.2	1
11996	Trichloroethene	79-01-6	1.6	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	10.7	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 15:00	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 15:00	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667605A	02/14/2017 22:36	Drew M Gerhart	1

Sample Description: BDC-05-02-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825337
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 11:21 by JH

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Seattle WA 98124

Submitted: 02/08/2017 09:50
Reported: 02/21/2017 10:59

0502V

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	5.4		1.0	1
07105	Ethene	74-85-1	1.2	J	1.0	1
07105	Methane	74-82-8	8,000	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	50	U	50	50
07105	Ethane	74-84-0	50	U	50	50
07105	Ethene	74-85-1	50	U	50	50
07105	Methane	74-82-8	9,600		150	50
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	18.8		3.0	10

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 16:14	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 17:15	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17040120121A	02/10/2017 00:45	Hallie A Burnett	10

Sample Description: BDC-05-02-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825338
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 11:21 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0021	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:00	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825339
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 11:21 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0042	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:01	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825340
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 11:21 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:03	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825341
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 11:21 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0018 J	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:08	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825342
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 12:46 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

0518-

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	2.4	0.2	1
11996	Tetrachloroethene	127-18-4	2.8	0.2	1
11996	Trichloroethene	79-01-6	3.4	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	1.8	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 15:21	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 15:21	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667605B	02/14/2017 23:34	Drew M Gerhart	1

Sample Description: BDC-05-18-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825343
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 12:46 by JH

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Submitted: 02/08/2017 09:50
Reported: 02/21/2017 10:59

0518V

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	750 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	5.0 U	5.0	5
07105	Ethane	74-84-0	5.0 U	5.0	5
07105	Ethene	74-85-1	5.0 U	5.0	5
07105	Methane	74-82-8	720	15	5
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	5.3	1.5	5

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 16:32	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 17:33	Johanna C Kennedy	5
00228	Sulfate	EPA 300.0	1	17040120901A	02/09/2017 20:28	Hallie A Burnett	5

Sample Description: BDC-05-18-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825344
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 12:46 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:10	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825345
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 12:46 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0112	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 01:51	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825346
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 12:46 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:12	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825347
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 12:46 by JH

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Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0029	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:13	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825348
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 13:41 by JH

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Seattle WA 98124

Submitted: 02/08/2017 09:50
Reported: 02/21/2017 10:59

0521-

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.5	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.4	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	9.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 15:41	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 15:41	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667605B	02/14/2017 23:47	Drew M Gerhart	1

Sample Description: BDC-05-21-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825349
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 13:41 by JH

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Submitted: 02/08/2017 09:50
Reported: 02/21/2017 10:59

0521V

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.6 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	5,700 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	9,100	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 16:50	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 18:10	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17044987131B	02/14/2017 07:09	Clinton M Wilson	1

Sample Description: BDC-05-21-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825350
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 13:41 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:15	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825351
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 13:41 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0066	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050010A	02/14/2017 02:17	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050010	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825352
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 13:41 by JH

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Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050011A	02/14/2017 00:46	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050011	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825353
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 13:41 by JH

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Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0062	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050011A	02/14/2017 00:47	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050011	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-23-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825354
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 14:41 by JH

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Submitted: 02/08/2017 09:50
Reported: 02/21/2017 10:59

0523-

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	2.1	ug/l 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.3	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	7.1	mg/l 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 16:02	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 16:02	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667605B	02/15/2017 00:17	Drew M Gerhart	1

Sample Description: BDC-05-23-170207 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825355
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 14:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

0523V

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 2.2	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17040120121A	02/10/2017 00:02	Hallie A Burnett	1

Sample Description: BDC-05-23-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825356
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 14:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050011A	02/14/2017 00:49	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050011	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-23-170207 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825357
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 14:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0157	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050011A	02/14/2017 00:37	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050011	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-23-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825358
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 14:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050011A	02/14/2017 00:54	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050011	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-23-170207 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825359
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017 14:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0158	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050011A	02/14/2017 00:56	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050011	02/12/2017 22:00	Annamaria Kuhns	1

Sample Description: Trip Blank Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8825360
LL Group # 1763309
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/07/2017

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/08/2017 09:50

Reported: 02/21/2017 10:59

0523T

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 14:20	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 14:20	Kerri E Legerlotz	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/21/2017 10:59

Group Number: 1763309

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: H170482AA	Sample number(s): 8825336, 8825342, 8825348, 8825354, 8825360	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 170410003A	Sample number(s): 8825337, 8825343, 8825349	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
	mg/l	mg/l
Batch number: 170417050010A	Sample number(s): 8825338-8825341, 8825344-8825347, 8825350-8825351	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 170417050011A	Sample number(s): 8825352-8825353, 8825356-8825359	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17045667605A	Sample number(s): 8825336	
Total Organic Carbon	1.0 U	1.0
Batch number: 17045667605B	Sample number(s): 8825342, 8825348, 8825354	
Total Organic Carbon	1.0 U	1.0
Analysis Name	Result	MDL
	mg/l	mg/l
Batch number: 17040120121A	Sample number(s): 8825337, 8825355	
Sulfate	0.30 U	0.30
Batch number: 17040120901A	Sample number(s): 8825343	
Sulfate	0.30 U	0.30
Batch number: 17044987131B	Sample number(s): 8825349	
Sulfate	0.30 U	0.30

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/21/2017 10:59

Group Number: 1763309

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H170482AA	Sample number(s): 8825336,8825342,8825348,8825354,8825360								
cis-1,2-Dichloroethene	5.00	4.90	5.00	4.80	98	96	80-120	2	30
Tetrachloroethene	5.00	5.06	5.00	4.86	101	97	80-120	4	30
Trichloroethene	5.00	5.04	5.00	4.92	101	98	80-120	2	30
Vinyl Chloride	5.00	5.64	5.00	5.58	113	112	62-128	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 170410003A	Sample number(s): 8825337,8825343,8825349								
Acetylene	51.2	42.83	51.2	41.85	84	82	61-148	2	20
Ethane	59.2	53.67	59.2	51.26	91	87	85-115	5	20
Ethene	60.8	54.34	60.8	52.12	89	86	83-115	4	20
Methane	59.8	57.59	59.8	54.87	96	92	85-115	5	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170417050010A	Sample number(s): 8825338-8825341,8825344-8825347,8825350-8825351								
Arsenic	0.0100	0.0101			101		85-115		
Copper	0.0500	0.0514			103		85-115		
Batch number: 170417050011A	Sample number(s): 8825352-8825353,8825356-8825359								
Arsenic	0.0100	0.00980			98		85-115		
Copper	0.0500	0.0500			100		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17045667605A	Sample number(s): 8825336								
Total Organic Carbon	25	24.92			100		91-113		
Batch number: 17045667605B	Sample number(s): 8825342,8825348,8825354								
Total Organic Carbon	25	24.92			100		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17040120121A	Sample number(s): 8825337,8825355								
Sulfate	7.50	7.56			101		90-110		
Batch number: 17040120901A	Sample number(s): 8825343								
Sulfate	7.50	7.47			100		90-110		
Batch number: 17044987131B	Sample number(s): 8825349								
Sulfate	7.50	7.16			95		90-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/21/2017 10:59

Group Number: 1763309

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 170417050010A	Sample number(s): 8825338-8825341,8825344-8825347,8825350-8825351 UNSPK: 8825345, P825345									
Arsenic	0.0112	0.0100	0.0202			89		70-130		
Copper	0.000442	0.0500	0.0520			103		70-130		
Batch number: 170417050011A	Sample number(s): 8825352-8825353,8825356-8825359 UNSPK: 8825357, P825357									
Arsenic	0.0157	0.0100	0.0246			89		70-130		
Copper	0.000473	0.0500	0.0489			97		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17045667605A	Sample number(s): 8825336 UNSPK: P826659									
Total Organic Carbon	9.04	10	18.94			99		64-148		
Batch number: 17045667605B	Sample number(s): 8825342,8825348,8825354 UNSPK: P828102									
Total Organic Carbon	1.10	10	11.08			100		64-148		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17040120121A	Sample number(s): 8825337,8825355 UNSPK: P823471									
Sulfate	5.82	25	30.5			99		90-110		
Batch number: 17040120901A	Sample number(s): 8825343 UNSPK: P815632									
Sulfate	57.59	25	86.82			117*		90-110		
Batch number: 17044987131B	Sample number(s): 8825349 UNSPK: P826550									
Sulfate	502.97	250	803.43			120*		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 170417050010A	Sample number(s): 8825338-8825341,8825344-8825347,8825350-8825351 BKG: 8825345, P825345			
Arsenic	0.0112	0.0112	1	20
Copper	0.000442	0.000494	11 (1)	20
Batch number: 170417050011A	Sample number(s): 8825352-8825353,8825356-8825359 BKG: 8825357, P825357			
Arsenic	0.0157	0.0161	3	20
Copper	0.000473	0.00034 U	200* (1)	20
	mg/l	mg/l		
Batch number: 17045667605A	Sample number(s): 8825336 BKG: P826659			

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/21/2017 10:59

Group Number: 1763309

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Total Organic Carbon	9.04	9.38	4*	3
Batch number: 17045667605B	Sample number(s): 8825342, 8825348, 8825354 BKG: P828102			
Total Organic Carbon	1.10	1.04	5* (1)	3
	mg/l	mg/l		
Batch number: 17040120121A	Sample number(s): 8825337, 8825355 BKG: P823471			
Sulfate	5.82	5.90	1 (1)	15
Batch number: 17040120901A	Sample number(s): 8825343 BKG: P815632			
Sulfate	57.59	57.49	0	15
Batch number: 17044987131B	Sample number(s): 8825349 BKG: P826550			
Sulfate	502.97	514.59	2	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H170482AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8825336	105	107	97	89
8825342	107	106	97	91
8825348	106	105	96	91
8825354	108	105	97	91
8825360	106	106	95	90
Blank	104	105	98	91
LCS	108	107	94	95
LCSD	105	103	94	94
Limits:	77-114	74-113	77-110	78-110

Analysis Name: AMEE by RSK-175
Batch number: 170410003A

	Propene
8825337	93
8825337DL	107
8825343	93
8825343DL	95
8825349	72
8825349DL	107
Blank	103
LCS	101

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/21/2017 10:59

Group Number: 1763309

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: AMEE by RSK-175

Batch number: 170410003A

Propene

LCSD	97
------	----

Limits: 44-123

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Client: Boeing

Delivery and Receipt Information

Delivery Method: Fed Ex Arrival Timestamp: 02/08/2017 9:50
 Number of Packages: 1 Number of Projects: 2

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Timothy Cubberley (6520) at 11:13 on 02/08/2017

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	1.9	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	none detected
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Report Date: February 27, 2017

Project: Boeing_DC:SWMU-17 s-ann

Submission Date: 02/09/2017

Group Number: 1764100

State of Sample Origin: WA

<u>Client Sample Description</u>	Lancaster Labs <u>(LL) #</u>
BDC-05-22-170208 Water	8828359
BDC-05-22-170208 Water	8828360
BDC-05-22-170208 Total Metals Water	8828361
BDC-05-22-170208 Total Metals Water	8828362
BDC-05-22-170208 Dissolved Metals Water	8828363
BDC-05-22-170208 Dissolved Metals Water	8828364
BDC-05-20-170208 Water	8828365
BDC-05-20-170208 Water	8828366
BDC-05-20-170208 Total Metals Water	8828367
BDC-05-20-170208 Total Metals Water	8828368
BDC-05-20-170208 Dissolved Metals Water	8828369
BDC-05-20-170208 Dissolved Metals Water	8828370
BDC-05-DUP-170208 Water	8828371
BDC-05-DUP-170208 Water	8828372
BDC-05-DUP-170208 Total Metals Water	8828373
BDC-05-DUP-170208 Total Metals Water	8828374
BDC-05-DUP-170208 Dissolved Metals Water	8828375
BDC-05-DUP-170208 Dissolved Metals Water	8828376
BDC-05-16-170208 Water	8828377
BDC-05-16-170208 Water	8828378
BDC-05-16-170208 Total Metals Water	8828379
BDC-05-16-170208 Total Metals Water	8828380
BDC-05-16-170208 Dissolved Metals Water	8828381
BDC-05-16-170208 Dissolved Metals Water	8828382
BDC-05-19-170208 Water	8828383
BDC-05-19-170208 Water	8828384
BDC-05-19-170208 Total Metals Water	8828385
BDC-05-19-170208 Total Metals Water	8828386
BDC-05-19-170208 Dissolved Metals Water	8828387
BDC-05-19-170208 Dissolved Metals Water	8828388
BDC-05-12-170208 Water	8828389
BDC-05-12-170208 Water	8828390

BDC-05-12-170208 Total Metals Water	8828391
BDC-05-12-170208 Total Metals Water	8828392
BDC-05-12-170208 Dissolved Metals Water	8828393
BDC-05-12-170208 Dissolved Metals Water	8828394
BDC-05-24-170208 Water	8828395
BDC-05-24-170208 Water	8828396
BDC-05-24-170208 Total Metals Water	8828397
BDC-05-24-170208 Total Metals Water	8828398
BDC-05-24-170208 Dissolved Metals Water	8828399
BDC-05-24-170208 Dissolved Metals Water	8828400
TRIP BLANK Water	8828401

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To The Boeing Company
Electronic Copy To Landau

Attn: Lindsey E. Mahrt
Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364

Project Name: Boeing_DC:SWMU-17 s-ann
LL Group #: 1764100

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 300.0, wet Chemistry**

Batch #: 17045987151A (Sample number(s): 8828396 UNSPK: P830165 BKG: P830165)

The recovery(ies) for the following analyte(s) in the MS was outside the acceptance window: Sulfate

Sample Description: BDC-05-22-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828359
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 07:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC221

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	8.4	ug/1 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.3	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	5.9	mg/1 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 19:46	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 19:46	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 19:10	Drew M Gerhart	1

Sample Description: BDC-05-22-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828360
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 07:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 0.34 J	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17044987902A	02/14/2017 09:20	Clinton M Wilson	1

Sample Description: BDC-05-22-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828361
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 07:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 01:55	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-22-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828362
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 07:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0259	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 01:57	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-22-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828363
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 07:41 by JH The Boeing Company
PO Box 3707
Submitted: 02/09/2017 13:50 MC 1W-12
Reported: 02/27/2017 13:03 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 01:59	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-22-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828364
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 07:41 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0260	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 02:04	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-20-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828365
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 08:26 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC201

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.8	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	13.0	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170482AA	02/17/2017 20:06	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170482AA	02/17/2017 20:06	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 19:23	Drew M Gerhart	1

Sample Description: BDC-05-20-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828366
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 08:26 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50
Reported: 02/27/2017 13:03

DC202

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	2.8 J	1.0	1
07105	Ethene	74-85-1	5.2	1.0	1
07105	Methane	74-82-8	5,600 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	7,100	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 17:26	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 18:46	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17044987902A	02/14/2017 09:35	Clinton M Wilson	1

Sample Description: BDC-05-20-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828367
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 08:26 by JH

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Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 01:47	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-20-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828368
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 08:26 by JH

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Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0290	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 02:06	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-20-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828369
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 08:26 by JH

The Boeing Company
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MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 02:07	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-20-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828370
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 08:26 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0299	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 02:09	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-DUP-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828371
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:00 by JH

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Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DCFD1

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.4	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	12.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170521AA	02/21/2017 19:44	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170521AA	02/21/2017 19:44	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 19:36	Drew M Gerhart	1

Sample Description: BDC-05-DUP-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828372
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:00 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50
Reported: 02/27/2017 13:03

DCFD2

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	3.4 J		1.0	1
07105	Ethene	74-85-1	1.0 U		1.0	1
07105	Methane	74-82-8	13,000 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	100 U		100	100
07105	Ethane	74-84-0	100 U		100	100
07105	Ethene	74-85-1	100 U		100	100
07105	Methane	74-82-8	16,000		300	100
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.33 J		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 17:45	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 19:05	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17044987902A	02/14/2017 09:50	Clinton M Wilson	1

Sample Description: BDC-05-DUP-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828373
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:00 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0027	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 02:11	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-DUP-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828374
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:00 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0185	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050014A	02/16/2017 02:13	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050014	02/14/2017 07:03	James L Mertz	1

Sample Description: BDC-05-DUP-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828375
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:00 by JH The Boeing Company
PO Box 3707
Submitted: 02/09/2017 13:50 MC 1W-12
Reported: 02/27/2017 13:03 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:04	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-DUP-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828376
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:00 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0119	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:06	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828377
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:21 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC161

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.8	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	17.7	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170521AA	02/21/2017 20:05	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170521AA	02/21/2017 20:05	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 19:49	Drew M Gerhart	1

Sample Description: BDC-05-16-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828378
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:21 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50
Reported: 02/27/2017 13:03

DC162

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	6.7	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	7,700 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	10,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 18:21	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 19:23	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17044987902A	02/14/2017 10:05	Clinton M Wilson	1

Sample Description: BDC-05-16-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828379
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:21 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:07	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828380
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:21 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0327	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:13	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828381
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:21 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:14	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828382
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 09:21 by JH The Boeing Company
PO Box 3707
Submitted: 02/09/2017 13:50 MC 1W-12
Reported: 02/27/2017 13:03 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0322	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:16	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-19-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828383
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 10:11 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC191

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	12.1	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170521AA	02/21/2017 20:25	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170521AA	02/21/2017 20:25	Kerri E Legerlotz	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 20:02	Drew M Gerhart	1

Sample Description: BDC-05-19-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828384
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 10:11 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50
Reported: 02/27/2017 13:03

DC192

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	3.2	J	1.0	1
07105	Ethene	74-85-1	1.0	U	1.0	1
07105	Methane	74-82-8	12,000	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	100	U	100	100
07105	Ethane	74-84-0	100	U	100	100
07105	Ethene	74-85-1	100	U	100	100
07105	Methane	74-82-8	16,000		300	100
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.32	J	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 18:39	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 19:41	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17044987902A	02/14/2017 10:19	Clinton M Wilson	1

Sample Description: BDC-05-19-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828385
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 10:11 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0030	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:18	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-19-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828386
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 10:11 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0228	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-19-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828387
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 10:11 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 10:55	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-19-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828388
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 10:11 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0107	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050015A	02/16/2017 11:21	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050015	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-12-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828389
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:01 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC121

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.4	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	8.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170523AA	02/21/2017 23:42	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170523AA	02/21/2017 23:42	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 20:30	Drew M Gerhart	1

Sample Description: BDC-05-12-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828390
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:01 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50
Reported: 02/27/2017 13:03

DC122

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	1.9 J		1.0	1
07105	Ethene	74-85-1	1.0 U		1.0	1
07105	Methane	74-82-8	6,800 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	50 U		50	50
07105	Ethane	74-84-0	50 U		50	50
07105	Ethene	74-85-1	50 U		50	50
07105	Methane	74-82-8	12,000		150	50
Trial ID: REDL						
07105	Acetylene	74-86-2	50 U		50	50
07105	Ethane	74-84-0	50 U		50	50
07105	Ethene	74-85-1	50 U		50	50
07105	Methane	74-82-8	12,000		150	50
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30 U		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 18:58	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 20:00	Johanna C Kennedy	50
07105	AMEE by RSK-175	RSKSOP-175 modified	3-RED L	170410003A	02/17/2017 11:27	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17044987902A	02/14/2017 10:34	Clinton M Wilson	1

Sample Description: BDC-05-12-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828391
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:01 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-12-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828392
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:01 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0057	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-12-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828393
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:01 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:07	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-12-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828394
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:01 by JH The Boeing Company
PO Box 3707
Submitted: 02/09/2017 13:50 MC 1W-12
Reported: 02/27/2017 13:03 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0071	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828395
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC241

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	1.3	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.3	0.2	1
11996	Vinyl Chloride	75-01-4	2.1	0.2	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	4.0	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170523AA	02/22/2017 00:02	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170523AA	02/22/2017 00:02	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17045667602A	02/14/2017 20:43	Drew M Gerhart	1

Sample Description: BDC-05-24-170208 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828396
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50
Reported: 02/27/2017 13:03

DC242

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	3.2	J	1.0	1
07105	Ethene	74-85-1	2.7	J	1.0	1
07105	Methane	74-82-8	4,600	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20	U	20	20
07105	Ethane	74-84-0	20	U	20	20
07105	Ethene	74-85-1	20	U	20	20
07105	Methane	74-82-8	5,900		60	20
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	1.8		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	170410003A	02/10/2017 19:16	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	170410003A	02/13/2017 20:18	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17045987151A	02/15/2017 02:20	Clinton M Wilson	1

Sample Description: BDC-05-24-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828397
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:24	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-170208 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828398
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0027	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828399
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:46 by JH The Boeing Company
PO Box 3707
Submitted: 02/09/2017 13:50 MC 1W-12
Reported: 02/27/2017 13:03 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
06033	Metals Dissolved Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0042	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:28	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-170208 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828400
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017 11:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0020 J	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	170417050016A	02/15/2017 16:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	170417050016	02/13/2017 22:00	Annamaria Kuhns	1

Sample Description: TRIP BLANK Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8828401
LL Group # 1764100
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 02/08/2017

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 02/09/2017 13:50

Reported: 02/27/2017 13:03

DC-TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H170521AA	02/21/2017 19:24	Kerri E Legerlotz	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H170521AA	02/21/2017 19:24	Kerri E Legerlotz	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/27/2017 13:03

Group Number: 1764100

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: H170482AA	Sample number(s): 8828359,8828365	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Batch number: H170521AA	Sample number(s): 8828371,8828377,8828383,8828401	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Batch number: H170523AA	Sample number(s): 8828389,8828395	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 170410003A	Sample number(s): 8828366,8828372,8828378,8828384,8828390,8828396	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
	mg/l	mg/l
Batch number: 170417050014A	Sample number(s): 8828361-8828364,8828367-8828370,8828373-8828374	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 170417050015A	Sample number(s): 8828375-8828376,8828379-8828382,8828385-8828388	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 170417050016A	Sample number(s): 8828391-8828394,8828397-8828400	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17045667602A	Sample number(s): 8828359,8828365,8828371,8828377,8828383,8828389,8828395	
Total Organic Carbon	1.0 U	1.0

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/27/2017 13:03

Group Number: 1764100

Method Blank (continued)

Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17044987902A Sulfate	0.30 U	0.30
Batch number: 17045987151A Sulfate	0.30 U	0.30

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: H170482AA	Sample number(s): 8828359,8828365								
cis-1,2-Dichloroethene	5.00	4.90	5.00	4.80	98	96	80-120	2	30
Tetrachloroethene	5.00	5.06	5.00	4.86	101	97	80-120	4	30
Trichloroethene	5.00	5.04	5.00	4.92	101	98	80-120	2	30
Vinyl Chloride	5.00	5.64	5.00	5.58	113	112	62-128	1	30
Batch number: H170521AA	Sample number(s): 8828371,8828377,8828383,8828401								
cis-1,2-Dichloroethene	5.00	4.94	5.00	4.83	99	97	80-120	2	30
Tetrachloroethene	5.00	5.12	5.00	4.90	102	98	80-120	5	30
Trichloroethene	5.00	5.13	5.00	4.86	103	97	80-120	5	30
Vinyl Chloride	5.00	5.57	5.00	5.20	111	104	62-128	7	30
Batch number: H170523AA	Sample number(s): 8828389,8828395								
cis-1,2-Dichloroethene	5.00	4.95	5.00	4.99	99	100	80-120	1	30
Tetrachloroethene	5.00	4.93	5.00	4.93	99	99	80-120	0	30
Trichloroethene	5.00	5.06	5.00	4.98	101	100	80-120	2	30
Vinyl Chloride	5.00	5.75	5.00	5.75	115	115	62-128	0	30
Batch number: 170410003A	Sample number(s): 8828366,8828372,8828378,8828384,8828390,8828396								
Acetylene	51.2	42.83	51.2	41.85	84	82	61-148	2	20
Ethane	59.2	53.67	59.2	51.26	91	87	85-115	5	20
Ethene	60.8	54.34	60.8	52.12	89	86	83-115	4	20
Methane	59.8	57.59	59.8	54.87	96	92	85-115	5	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 170417050014A	Sample number(s): 8828361-8828364,8828367-8828370,8828373-8828374								
Arsenic	0.0100	0.0102			102		85-115		
Copper	0.0500	0.0504			101		85-115		
Batch number: 170417050015A	Sample number(s): 8828375-8828376,8828379-8828382,8828385-8828388								
Arsenic	0.0100	0.0102			102		85-115		

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/27/2017 13:03

Group Number: 1764100

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Copper	0.0500	0.0493			99		85-115		
Batch number: 170417050016A	Sample number(s): 8828391-8828394,8828397-8828400								
Arsenic	0.0100	0.00925			92		85-115		
Copper	0.0500	0.0479			96		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17045667602A	Sample number(s): 8828359,8828365,8828371,8828377,8828383,8828389,8828395								
Total Organic Carbon	25	26.05			104		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17044987902A	Sample number(s): 8828360,8828366,8828372,8828378,8828384,8828390								
Sulfate	7.50	7.27			97		90-110		
Batch number: 17045987151A	Sample number(s): 8828396								
Sulfate	7.50	7.60			101		90-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 170417050014A	Sample number(s): 8828361-8828364,8828367-8828370,8828373-8828374 UNSPK: 8828367, P828367									
Arsenic	0.0307	0.0100	0.0414			107		70-130		
Copper	0.000387	0.0500	0.0509			101		70-130		
Batch number: 170417050015A	Sample number(s): 8828375-8828376,8828379-8828382,8828385-8828388 UNSPK: 8828387, P828387									
Arsenic	0.0113	0.0100	0.0210			97		70-130		
Copper	0.00034 U	0.0500	0.0506			101		70-130		
Batch number: 170417050016A	Sample number(s): 8828391-8828394,8828397-8828400 UNSPK: 8828393, P828393									
Arsenic	0.00596	0.0100	0.0165			105		70-130		
Copper	0.00034 U	0.0500	0.0482			96		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17045667602A	Sample number(s): 8828359,8828365,8828371,8828377,8828383,8828389,8828395 UNSPK: P795164									
Total Organic Carbon	12.94	10	22.69			98		64-148		
	mg/l	mg/l	mg/l	mg/l	mg/l					

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/27/2017 13:03

Group Number: 1764100

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17044987902A Sulfate	20.13	25	42.79			91		90-110		
Batch number: 17045987151A Sulfate	52.03	25	85.4			133*		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 170417050014A	Sample number(s): 8828361-8828364,8828367-8828370,8828373-8828374 BKG: 8828367, P828367			
Arsenic	0.0307	0.0306	0	20
Copper	0.000387	0.000400	3 (1)	20
Batch number: 170417050015A	Sample number(s): 8828375-8828376,8828379-8828382,8828385-8828388 BKG: 8828387, P828387			
Arsenic	0.0113	0.0112	1	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 170417050016A	Sample number(s): 8828391-8828394,8828397-8828400 BKG: 8828393, P828393			
Arsenic	0.00596	0.00644	8 (1)	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 17045667602A	Sample number(s): 8828359,8828365,8828371,8828377,8828383,8828389,8828395 BKG: P795164			
Total Organic Carbon	12.94	12.76	1	3
Batch number: 17044987902A Sulfate	20.13	19.91	1 (1)	15
Batch number: 17045987151A Sulfate	52.03	52.49	1	15

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/27/2017 13:03

Group Number: 1764100

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H170482AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8828359	108	107	95	92
8828365	106	110	97	91
Blank	104	105	98	91
LCS	108	107	94	95
LCSD	105	103	94	94
Limits:	77-114	74-113	77-110	78-110

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H170521AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8828371	107	109	95	93
8828377	106	109	95	93
8828383	108	113	93	92
8828401	107	106	93	93
Blank	107	105	97	91
LCS	107	105	95	95
LCSD	108	101	94	95
Limits:	77-114	74-113	77-110	78-110

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H170523AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8828389	106	103	94	91
8828395	106	104	95	89
Blank	106	105	95	90
LCS	109	108	95	95
LCSD	106	102	93	93
Limits:	77-114	74-113	77-110	78-110

Analysis Name: AMEE by RSK-175
Batch number: 170410003A

	Propene
8828366	80
8828366DL	101
8828372	77
8828372DL	100
8828378	88
8828378DL	102
8828384	87
8828384DL	99
8828390	78
8828390DL	99

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 02/27/2017 13:03

Group Number: 1764100

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: AMEE by RSK-175
Batch number: 170410003A

	Propene
8828390REDL	94
8828396	82
8828396DL	103
Blank	103
LCS	101
LCS D	97

Limits: 44-123

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Client: Boeing

Delivery and Receipt Information

Delivery Method: UPS Arrival Timestamp: 02/09/2017 13:50
 Number of Packages: 1 Number of Projects: 1

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	Yes
Samples Chilled:	Yes	VOA IDs (\geq 6mm):	See Below
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	2
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

VOA Vial IDs (Headspace \geq 6mm): 2 of 2 TB.

Unpacked by Melvin Sanchez (8943) at 15:56 on 02/09/2017

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT131	3.1	DT	Wet	Y	Bagged	N

General Comments: Received Metals Batch QC: BDC-05-20-170208.

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	none detected
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Report Date: May 26, 2017

Project: Boeing_DC:SWMU-17 s-ann

Submittal Date: 05/04/2017

Group Number: 1796929

State of Sample Origin: WA

<u>Client Sample Description</u>	Lancaster Labs (LL) #
BDC-05-05-170503 Water	8973561
BDC-05-05-170503 Water	8973562
BDC-05-05-170503 Total Metals Water	8973563
BDC-05-05-170503 Total Metals Water	8973564
BDC-05-05-170503 Dissolved Metals Water	8973565
BDC-05-05-170503 Dissolved Metals Water	8973566
BDC-05-04-170503 Water	8973567
BDC-05-04-170503 Water	8973568
BDC-05-04-170503 Total Metals Water	8973569
BDC-05-04-170503 Total Metals Water	8973570
BDC-05-04-170503 Dissolved Metals Water	8973571
BDC-05-04-170503 Dissolved Metals Water	8973572
BDC-05-18-170503 Water	8973573
BDC-05-18-170503 Water	8973574
BDC-05-18-170503 Total Metals Water	8973575
BDC-05-18-170503 Total Metals Water	8973576
BDC-05-18-170503 Dissolved Metals Water	8973577
BDC-05-18-170503 Dissolved Metals Water	8973578
BDC-05-21-170503 Water	8973579
BDC-05-21-170503 Water	8973580
BDC-05-21-170503 Total Metals Water	8973581
BDC-05-21-170503 Total Metals Water	8973582
BDC-05-21-170503 Dissolved Metals Water	8973583
BDC-05-21-170503 Dissolved Metals Water	8973584
BDC-05-23-170503 Water	8973585
BDC-05-23-170503 Water	8973586
BDC-05-23-170503 Total Metals Water	8973587
BDC-05-23-170503 Total Metals Water	8973588
BDC-05-23-170503 Dissolved Metals Water	8973589
BDC-05-23-170503 Dissolved Metals Water	8973590
BDC-Dup3-170503 Water	8973591
BDC-Dup3-170503 Water	8973592

REVISED

BDC-Dup3-170503 Total Metals Water	8973593
BDC-Dup3-170503 Total Metals Water	8973594
BDC-Dup3-170503 Dissolved Metals Water	8973595
BDC-Dup3-170503 Dissolved Metals Water	8973596
Trip Blank Water	8973597

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To The Boeing Company
Electronic Copy To Landau

Attn: Lindsey E. Mahrt
Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364

Project Name: Boeing_DC:SWMU-17 s-ann
LL Group #: 1796929

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**RSKSOP-175 modified, GC Miscellaneous**

Sample #s: 8973592

The container used for this analysis was submitted with headspace.

Batch #: 171270001A (Sample number(s): 8973574, 8973580, 8973592 UNSPK: P974857)

The recovery(ies) for the following analyte(s) in the MS and/or MSD were below the acceptance window: Methane, Ethane

EPA 300.0, wet Chemistry

Sample #s: 8973567

This sample was originally analyzed within the 48 hour holding time for nitrite nitrogen, however the continuing calibration standard bracketing the sample were outside of the 90% to 110% acceptance window with a recovery of 85%. The analysis was repeated on 5/9/2017 with results of non detect, comparable to the initial in hold trial results. Per the client, both trials are being reported.

May 26, 2017

Ms. Lindsey E. Mahrt
The Boeing Company
PO Box 3707
MC 1W-12
Seattle, WA 98124

Dear Ms. Mahrt

I am writing to inform you of revised analytical reports that are being issued for the following:

Project: Boeing_DC: SWMU-17 s-ann
Group No.: 1796929

ELLE Sample No.	Client Sample Identification	Collection Date
8973592	BDC-Dup3-170503	05/03/2017 16:00

The correction to the data affects the RSK-175 analysis only.

In response to your inquiry regarding the compounds reported by the RSK-175 method, the additional compounds n-butane, isobutene, and propane have been removed from sample BDC-Dup3-170503(8973592). The results for the removed compounds were non-detect.

The revised analytical report reflects this correction and is enclosed.

You are a valued client and we apologize for any inconvenience that this incident may have caused. If you have any questions or require further assistance, please call me at 717-656-2300, Ext. 1103. We appreciate your business and look forward to continuing to serve your laboratory needs.

Sincerely,



Ana Spencer
Project Manager
Client Services

AS/mk
Enclosures

cc: Kay Hower

REVISED

Sample Description: BDC-05-05-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973561
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 11:30 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

DC551

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.4	0.2	1
11996	Trichloroethene	79-01-6	0.7	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	1.9	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 03:47	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 03:47	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17125667605B	05/05/2017 23:06	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-05-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973562
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 11:30 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

DC552

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 21.3	mg/l 1.5	5

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17132987312A	05/13/2017 12:55	Clinton M Wilson	5

Sample Description: BDC-05-05-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973563
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 11:30 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0028	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 04:59	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-05-05-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973564
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 11:30 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.00087 J	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:08	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-05-05-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973565
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 11:30 by JA The Boeing Company
PO Box 3707
Submitted: 05/04/2017 09:30 MC 1W-12
Reported: 05/26/2017 11:38 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:10	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-05-05-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973566
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 11:30 by JA The Boeing Company
PO Box 3707
Submitted: 05/04/2017 09:30 MC 1W-12
Reported: 05/26/2017 11:38 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved					
06025	Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.00040 U	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:12	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-05-04-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973567
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 12:31 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30
Reported: 05/26/2017 11:38

DC541

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.3	0.2	1
11996	Tetrachloroethene	127-18-4	1.2	0.2	1
11996	Trichloroethene	79-01-6	0.4	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry EPA 300.0					
00368	Nitrate Nitrogen	14797-55-8	8.8	1.0	10
01506	Nitrite Nitrogen	14797-65-0	0.10 U	0.10	1
This sample was originally analyzed within the 48 hour holding time for nitrite nitrogen, however the continuing calibration standard bracketing the sample were outside of the 90% to 110% acceptance window with a recovery of 85%. The analysis was repeated on 5/9/2017 with results of non detect, comparable to the initial in hold trial results. Per the client, both trials are being reported.					
01506	Nitrite Nitrogen	14797-65-0	0.10 U	0.10	1
This sample was originally analyzed within the 48 hour holding time for nitrite nitrogen, however the continuing calibration standard bracketing the sample were outside of the 90% to 110% acceptance window with a recovery of 85%. The analysis was repeated on 5/9/2017 with results of non detect, comparable to the initial in hold trial results. Per the client, both trials are being reported.					
SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	3.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 04:07	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 04:07	Don V Viray	1
00368	Nitrate Nitrogen	EPA 300.0	3	17124249106A	05/05/2017 10:49	Zachary W Enck	10
01506	Nitrite Nitrogen	EPA 300.0	1	17124249106A	05/09/2017 04:28	Zachary W Enck	1
01506	Nitrite Nitrogen	EPA 300.0	2	17124249106A	05/05/2017 10:34	Zachary W Enck	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17125667605B	05/05/2017 23:20	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-04-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973568
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 12:31 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

DC542

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 12.0	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17132987312A	05/13/2017 12:06	Clinton M Wilson	1

Sample Description: BDC-05-04-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973569
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 12:31 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0034	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:17	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-05-04-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973570
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 12:31 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0011 J	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:19	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

REVISED

Sample Description: BDC-05-04-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973571
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 12:31 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
06033	Metals Dissolved Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0029	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:21	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

REVISED

Sample Description: BDC-05-04-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973572
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 12:31 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.00071 J	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:23	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

REVISED

Sample Description: BDC-05-18-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973573
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 13:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

D5181

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	1.3	0.2	1
11996	Tetrachloroethene	127-18-4	3.6	0.2	1
11996	Trichloroethene	79-01-6	4.6	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	1.7	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 04:28	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 04:28	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17125667605B	05/05/2017 23:51	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-18-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973574
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 13:36 by JA

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MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30
Reported: 05/26/2017 11:38

D5182

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	95	3.0	1
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	8.1	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 11:33	Johanna C Kennedy	1
00228	Sulfate	EPA 300.0	1	17132987312A	05/13/2017 13:45	Clinton M Wilson	1

Sample Description: BDC-05-18-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973575
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 13:36 by JA The Boeing Company
PO Box 3707
Submitted: 05/04/2017 09:30 MC 1W-12
Reported: 05/26/2017 11:38 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:24	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

REVISED

Sample Description: BDC-05-18-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973576
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 13:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0065	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705009A	05/12/2017 05:26	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705009	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-05-18-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973577
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 13:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 03:49	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

Sample Description: BDC-05-18-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973578
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 13:36 by JA

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0017 J	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 03:58	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

REVISED

Sample Description: BDC-05-21-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973579
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 14:36 by JA

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Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

D5211

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.7	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	2.0	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	9.1	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 04:48	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 04:48	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17125667605B	05/06/2017 00:05	Drew M Gerhart	1

Sample Description: BDC-05-21-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973580
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 14:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

D5212

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	1.3	J	1.0	1
07105	Ethene	74-85-1	2.8	J	1.0	1
07105	Methane	74-82-8	4,200	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20	U	20	20
07105	Ethane	74-84-0	20	U	20	20
07105	Ethene	74-85-1	20	U	20	20
07105	Methane	74-82-8	3,400		60	20
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.64	J	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 11:48	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/17/2017 12:59	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17132987312A	05/13/2017 14:02	Clinton M Wilson	1

Sample Description: BDC-05-21-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973581
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 14:36 by JA

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:00	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

REVISED

Sample Description: BDC-05-21-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973582
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 14:36 by JA

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PO Box 3707
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Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0089	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:02	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

REVISED

Sample Description: BDC-05-21-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973583
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 14:36 by JA

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Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:07	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

REVISED

Sample Description: BDC-05-21-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973584
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 14:36 by JA

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Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0090	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:09	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

REVISED

Sample Description: BDC-05-23-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973585
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 15:36 by JA

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

D5231

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	2.0	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	7.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 05:08	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 05:08	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17125667605B	05/06/2017 00:19	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-23-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973586
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 15:36 by JA

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

D5232

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 10.9	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17132987312A	05/13/2017 14:18	Clinton M Wilson	1

Sample Description: BDC-05-23-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973587
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 15:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:11	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

Sample Description: BDC-05-23-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973588
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 15:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0260	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:13	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

REVISED

Sample Description: BDC-05-23-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973589
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 15:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:15	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

Sample Description: BDC-05-23-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973590
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 15:36 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0256	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705010A	05/12/2017 04:16	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705010	05/11/2017 07:10	James L Mertz	1

Sample Description: BDC-Dup3-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973591
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 16:00 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

DDU31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.7	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.9	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	9.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 05:29	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 05:29	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17125667605B	05/06/2017 00:33	Drew M Gerhart	1

Sample Description: BDC-Dup3-170503 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973592
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 16:00 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

DDU32

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous RSKSOP-175 modified ug/l						
07105	Acetylene	74-86-2	1.0 U	ug/l	1.0	1
07105	Ethane	74-84-0	1.3 J	ug/l	1.0	1
07105	Ethene	74-85-1	2.8 J	ug/l	1.0	1
07105	Methane	74-82-8	4,200 E	ug/l	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20 U	ug/l	20	20
07105	Ethane	74-84-0	20 U	ug/l	20	20
07105	Ethene	74-85-1	20 U	ug/l	20	20
07105	Methane	74-82-8	4,900	ug/l	60	20
The container used for this analysis was submitted with headspace.						
Wet Chemistry EPA 300.0 mg/l						
00228	Sulfate	14808-79-8	0.65 J	mg/l	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 12:04	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 15:52	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17132987312A	05/13/2017 14:35	Clinton M Wilson	1

Sample Description: BDC-Dup3-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973593
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 16:00 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705008A	05/12/2017 02:54	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705008	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-Dup3-170503 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973594
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 16:00 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0089	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705008A	05/12/2017 02:55	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705008	05/11/2017 06:37	James L Mertz	1

Sample Description: BDC-Dup3-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973595
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 16:00 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705008A	05/12/2017 03:01	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705008	05/11/2017 06:37	James L Mertz	1

REVISED

Sample Description: BDC-Dup3-170503 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973596
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017 16:00 by JA

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0088	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705008A	05/12/2017 03:03	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705008	05/11/2017 06:37	James L Mertz	1

REVISED

Sample Description: Trip Blank Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8973597
LL Group # 1796929
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/03/2017

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/04/2017 09:30

Reported: 05/26/2017 11:38

S17BT

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457
State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171285AA	05/09/2017 03:27	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171285AA	05/09/2017 03:27	Don V Viray	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/26/2017 11:38

Group Number: 1796929

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: H171285AA	Sample number(s): 8973561,8973567,8973573,8973579,8973585,8973591,8973597	
cis-1,2-Dichloroethene	0.5 U	0.5
Tetrachloroethene	0.5 U	0.5
Trichloroethene	0.5 U	0.5
Vinyl Chloride	0.5 U	0.5

Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 171270001A	Sample number(s): 8973574,8973580,8973592	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0

	mg/l	mg/l
Batch number: 171300705008A	Sample number(s): 8973593-8973596	
Arsenic	0.00040 U	0.00040
Copper	0.00074 J	0.00021
Batch number: 171300705009A	Sample number(s): 8973563-8973566,8973569-8973572,8973575-8973576	
Arsenic	0.00040 U	0.00040
Copper	0.00068 J	0.00021
Batch number: 171300705010A	Sample number(s): 8973577-8973578,8973581-8973584,8973587-8973590	
Arsenic	0.00040 U	0.00040
Copper	0.00021 U	0.00021

Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17124249106A	Sample number(s): 8973567	
Nitrate Nitrogen	0.10 U	0.10
Nitrite Nitrogen	0.10 U	0.10

Batch number: 17125667605B	Sample number(s): 8973561,8973567,8973573,8973579,8973585,8973591	
Total Organic Carbon	1.0 U	1.0

Analysis Name	Result	MDL
	mg/l	mg/l
Batch number: 17132987312A	Sample number(s): 8973562,8973568,8973574,8973580,8973586,8973592	
Sulfate	0.30 U	0.30

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/26/2017 11:38

Group Number: 1796929

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H171285AA	Sample number(s): 8973561,8973567,8973573,8973579,8973585,8973591,8973597								
cis-1,2-Dichloroethene	5.00	5.39	5.00	5.47	108	109	80-120	2	30
Tetrachloroethene	5.00	4.93	5.00	5.08	99	102	80-120	3	30
Trichloroethene	5.00	5.08	5.00	5.13	102	103	80-120	1	30
Vinyl Chloride	5.00	5.14	5.00	5.08	103	102	62-128	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 171270001A	Sample number(s): 8973574,8973580,8973592								
Acetylene	51.1	43.96			86		61-148		
Ethane	58.4	55.08			94		85-115		
Ethene	60.8	55.85			92		83-115		
Methane	59.8	57.07			95		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 171300705008A	Sample number(s): 8973593-8973596								
Arsenic	0.0100	0.00959			96		85-115		
Copper	0.0500	0.0488			98		85-115		
Batch number: 171300705009A	Sample number(s): 8973563-8973566,8973569-8973572,8973575-8973576								
Arsenic	0.0100	0.0101			101		80-120		
Copper	0.0500	0.0503			101		80-120		
Batch number: 171300705010A	Sample number(s): 8973577-8973578,8973581-8973584,8973587-8973590								
Arsenic	0.0100	0.00997			100		85-115		
Copper	0.0500	0.0490			98		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17124249106A	Sample number(s): 8973567								
Nitrate Nitrogen	0.750	0.735			98		90-110		
Nitrite Nitrogen	0.750	0.731			98		90-110		
Batch number: 17125667605B	Sample number(s): 8973561,8973567,8973573,8973579,8973585,8973591								
Total Organic Carbon	25	24.5			98		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17132987312A	Sample number(s): 8973562,8973568,8973574,8973580,8973586,8973592								
Sulfate	7.50	7.14			95		90-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
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*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/26/2017 11:38

Group Number: 1796929

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 171270001A	Sample number(s): 8973574,8973580,8973592 UNSPK: P974857									
Acetylene	1.0 U	51.1	42.63	51.1	42.17	83		61-148	1	20
Ethane	503.89	58.4	537.3	58.4	527.83	57 (2)	41 (2)	74-131	2	30
Ethene	1.0 U	60.8	63.18	60.8	61.99	104	102	72-133	2	30
Methane	18565.78	59.8	17638	59.8	17585.46	-1550 (2)	-1638 (2)	73-125	0	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 171300705008A	Sample number(s): 8973593-8973596 UNSPK: P977629									
Arsenic	0.0306	0.0100	0.0424	0.0100	0.0405	118	99	70-130	5	20
Copper	0.000255	0.0500	0.0490	0.0500	0.0475	98	95	70-130	3	20
Batch number: 171300705009A	Sample number(s): 8973563-8973566,8973569-8973572,8973575-8973576 UNSPK: 8973563, P973563									
Arsenic	0.000878	0.0100	0.0115			106		70-130		
Copper	0.00276	0.0500	0.0510			96		70-130		
Batch number: 171300705010A	Sample number(s): 8973577-8973578,8973581-8973584,8973587-8973590 UNSPK: 8973577, P973577									
Arsenic	0.00164	0.0100	0.0122			105		70-130		
Copper	0.000383	0.0500	0.0498			99		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17124249106A	Sample number(s): 8973567 UNSPK: P974902									
Nitrate Nitrogen	1.61	5.00	6.39			96		90-110		
Nitrite Nitrogen	0.10 U	0.500	0.481			96		90-110		
Batch number: 17125667605B	Sample number(s): 8973561,8973567,8973573,8973579,8973585,8973591 UNSPK: P974856									
Total Organic Carbon	22.3	10	31.87			96		64-148		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17132987312A	Sample number(s): 8973562,8973568,8973574,8973580,8973586,8973592 UNSPK: 8973568									
Sulfate	11.95	10	21.35			94		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 171300705008A	Sample number(s): 8973593-8973596 BKG: P977629			
Arsenic	0.0306	0.0325	6	20

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/26/2017 11:38

Group Number: 1796929

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Copper	0.000255	0.000253	1 (1)	20
Batch number: 171300705009A	Sample number(s): 8973563-8973566,8973569-8973572,8973575-8973576 BKG: 8973563, P973563			
Arsenic	0.000878	0.000938	7 (1)	20
Copper	0.00276	0.00266	4 (1)	20
Batch number: 171300705010A	Sample number(s): 8973577-8973578,8973581-8973584,8973587-8973590 BKG: 8973577, P973577			
Arsenic	0.00164	0.00152	7 (1)	20
Copper	0.000383	0.000378	1 (1)	20
Batch number: 17124249106A	Sample number(s): 8973567 BKG: P974902			
Nitrate Nitrogen	1.61	1.61	0	15
Nitrite Nitrogen	0.10 U	0.10 U	0 (1)	15
Batch number: 17125667605B	Sample number(s): 8973561,8973567,8973573,8973579,8973585,8973591 BKG: P974856			
Total Organic Carbon	22.3	22.88	3	9
Batch number: 17132987312A	Sample number(s): 8973562,8973568,8973574,8973580,8973586,8973592 BKG: 8973568			
Sulfate	11.95	11.92	0	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H171285AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8973561	102	107	103	97
8973567	100	101	105	97
8973573	102	105	104	98
8973579	99	100	105	98
8973585	99	96	106	98
8973591	101	101	105	99
8973597	101	102	104	97
Blank	102	100	103	100
LCS	104	104	100	105
LCSD	103	102	101	104
Limits:	77-114	74-113	77-110	78-110

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/26/2017 11:38

Group Number: 1796929

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: AMEE by RSK-175
Batch number: 171270001A

	Propene
8973574	80
8973580	80
8973580DL	108
8973592	77
8973592DL	89
Blank	92
LCS	91
MS	74
MSD	72

Limits: 44-123

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Client: BOEING

Delivery and Receipt Information

Delivery Method:	<u>UPS</u>	Arrival Timestamp:	<u>05/04/2017 9:30</u>
Number of Packages:	<u>1</u>	Number of Projects:	<u>1</u>

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	2
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Evelyn Shank (12390) at 10:19 on 05/04/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT121	1.1	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	none detected
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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ANALYTICAL RESULTS

Prepared by:

Prepared for:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Report Date: May 18, 2017

Project: Boeing_DC:SWMU-17 s-ann

Submittal Date: 05/06/2017

Group Number: 1798197

State of Sample Origin: WA

<u>Client Sample Description</u>	Lancaster Labs (LL) #
BDC-05-08-170504 Water	8979692
BDC-05-08-170504 Water	8979693
BDC-05-02-170504 Water	8979694
BDC-05-02-170504 Water	8979695
BDC-05-02-170504 Total Metals Water	8979696
BDC-05-02-170504 Total Metals Water	8979697
BDC-05-02-170504 Dissolved Metals Water	8979698
BDC-05-02-170504 Dissolved Metals Water	8979699
BDC-05-07-170504 Water	8979700
BDC-05-07-170504 Water	8979701
BDC-05-07-170504 Total Metals Water	8979702
BDC-05-07-170504 Total Metals Water	8979703
BDC-05-07-170504 Dissolved Metals Water	8979704
BDC-05-07-170504 Dissolved Metals Water	8979705
BDC-05-09-170504 Water	8979706
BDC-05-09-170504 Water	8979707
BDC-05-09-170504 Total Metals Water	8979708
BDC-05-09-170504 Total Metals Water	8979709
BDC-05-09-170504 Dissolved Metals Water	8979710
BDC-05-09-170504 Dissolved Metals Water	8979711
BDC-05-10-170504 Water	8979712
BDC-05-10-170504 Water	8979713
BDC-05-10-170504 Total Metals Water	8979714
BDC-05-10-170504 Total Metals Water	8979715
BDC-05-10-170504 Dissolved Metals Water	8979716
BDC-05-10-170504 Dissolved Metals Water	8979717
BDC-05-11-170504 Water	8979718
BDC-05-11-170504 Water	8979719
BDC-05-11-170504 Total Metals Water	8979720
BDC-05-11-170504 Total Metals Water	8979721
BDC-05-11-170504 Dissolved Metals Water	8979722
BDC-05-11-170504 Dissolved Metals Water	8979723

BDC-05-03-170504 Water	8979724
BDC-05-03-170504 Water	8979725
BDC-05-03-170504 Total Metals Water	8979726
BDC-05-03-170504 Total Metals Water	8979727
BDC-05-03-170504 Dissolved Metals Water	8979728
BDC-05-03-170504 Dissolved Metals Water	8979729
BDC-05-12-170504 Water	8979730
BDC-05-12-170504 Water	8979731
BDC-05-12-170504 Total Metals Water	8979732
BDC-05-12-170504 Total Metals Water	8979733
BDC-05-12-170504 Dissolved Metals Water	8979734
BDC-05-12-170504 Dissolved Metals Water	8979735
BDC-05-19-170504 Water	8979736
BDC-05-19-170504 Water	8979737
BDC-05-19-170504 Total Metals Water	8979738
BDC-05-19-170504 Total Metals Water	8979739
BDC-05-19-170504 Dissolved Metals Water	8979740
BDC-05-19-170504 Dissolved Metals Water	8979741
BDC-05-13-170504 Water	8979742
BDC-05-13-170504 Water	8979743
BDC-05-13-170504 Total Metals Water	8979744
BDC-05-13-170504 Total Metals Water	8979745
BDC-05-13-170504 Dissolved Metals Water	8979746
BDC-05-13-170504 Dissolved Metals Water	8979747
BDC-05-24-170504 Water	8979748
BDC-05-24-170504 Water	8979749
BDC-05-24-170504 Total Metals Water	8979750
BDC-05-24-170504 Total Metals Water	8979751
BDC-05-24-170504 Dissolved Metals Water	8979752
BDC-05-24-170504 Dissolved Metals Water	8979753
BDC-05-15-170504 Water	8979754
BDC-05-15-170504 Water	8979755
BDC-05-15-170504 Total Metals Water	8979756
BDC-05-15-170504 Total Metals Water	8979757
BDC-05-15-170504 Dissolved Metals Water	8979758
BDC-05-15-170504 Dissolved Metals Water	8979759
BDC-05-14-170504 Water	8979760
BDC-05-14-170504 Water	8979761
BDC-05-14-170504 Total Metals Water	8979762
BDC-05-14-170504 Total Metals Water	8979763
BDC-05-14-170504 Dissolved Metals Water	8979764
BDC-05-14-170504 Dissolved Metals Water	8979765
BDC-05-22-170504 Water	8979766
BDC-05-22-170504 Water	8979767
BDC-05-22-170504 Total Metals Water	8979768
BDC-05-22-170504 Total Metals Water	8979769
BDC-05-22-170504 Dissolved Metals Water	8979770
BDC-05-22-170504 Dissolved Metals Water	8979771
BDC-05-20-170504 Water	8979772
BDC-05-20-170504 Water	8979773
BDC-05-20-170504 Total Metals Water	8979774
BDC-05-20-170504 Total Metals Water	8979775

BDC-05-20-170504 Dissolved Metals Water	8979776
BDC-05-20-170504 Dissolved Metals Water	8979777
BDC-05-17-170504 Water	8979778
BDC-05-17-170504 Water	8979779
BDC-05-17-170504 Total Metals Water	8979780
BDC-05-17-170504 Total Metals Water	8979781
BDC-05-17-170504 Dissolved Metals Water	8979782
BDC-05-17-170504 Dissolved Metals Water	8979783
BDC-05-16-170504 Water	8979784
BDC-05-16-170504 Water	8979785
BDC-05-16-170504 Total Metals Water	8979786
BDC-05-16-170504 Total Metals Water	8979787
BDC-05-16-170504 Dissolved Metals Water	8979788
BDC-05-16-170504 Dissolved Metals Water	8979789
TRIP BLANK Water	8979790

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	The Boeing Company	Attn: Jennifer Parsons
Electronic Copy To	The Boeing Company	Attn: Lindsey E. Mahrt
Electronic Copy To	Landau	Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364

Project Name: Boeing_DC:SWMU-17 s-ann
LL Group #: 1798197

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**SW-846 8260C, GC/MS volatiles**

Batch #: H171341AA (Sample number(s): 8979730, 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778, 8979784, 8979790 UNSPK: 8979784)

The recovery(ies) for the following analyte(s) in the MS and/or MSD exceeded the acceptance window indicating a positive bias: cis-1,2-Dichloroethene, Tetrachloroethene

RSKSOP-175 modified, GC Miscellaneous

Sample #s: 8979761, 8979779

Reporting limits were raised due to interference from the sample matrix.

Batch #: 171270001A (Sample number(s): 8979695, 8979701, 8979707, 8979713, 8979719, 8979725, 8979731, 8979737 UNSPK: P974857)

The recovery(ies) for the following analyte(s) in the MS and/or MSD were below the acceptance window: Methane, Ethane

Batch #: 171280032A (Sample number(s): 8979743, 8979749, 8979755, 8979761, 8979773, 8979779, 8979785 UNSPK: 8979785)

The recovery(ies) for the following analyte(s) in the MS and/or MSD were below the acceptance window: Methane

EPA 200.8 rev 5.4, Metals

Batch #: 171320705006A (Sample number(s): 8979786-8979789 UNSPK: 8979786 BKG: 8979786)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Copper

EPA 200.8 rev 5.4, Metals Dissolved

Batch #: 171320705006A (Sample number(s): 8979786-8979789 UNSPK: 8979786 BKG: 8979786)

The duplicate RPD for the following analyte(s) exceeded the acceptance window:
Copper

Sample Description: BDC-05-08-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979692
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 06:56 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05081

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	5.7	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 02:58	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 02:58	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 21:36	Drew M Gerhart	1

Sample Description: BDC-05-08-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979693
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 06:56 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05082

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 0.41 J	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17136972106A	05/16/2017 23:25	Alexandria M Lanager	1

Sample Description: BDC-05-02-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979694
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 07:31 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05021

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.4	0.2	1
11996	Tetrachloroethene	127-18-4	4.2	0.2	1
11996	Trichloroethene	79-01-6	2.0	0.2	1
11996	Vinyl Chloride	75-01-4	0.4	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	15.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 03:18	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 03:18	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 21:50	Drew M Gerhart	1

Sample Description: BDC-05-02-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979695
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 07:31 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05022

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	3.6 J		1.0	1
07105	Ethene	74-85-1	1.0 U		1.0	1
07105	Methane	74-82-8	4,200 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20 U		20	20
07105	Ethane	74-84-0	20 U		20	20
07105	Ethene	74-85-1	20 U		20	20
07105	Methane	74-82-8	5,000		60	20
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	23.2		1.5	5

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 13:05	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 17:50	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 01:36	Alexandria M Lanager	5

Sample Description: BDC-05-02-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979696
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 07:31 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0065	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:09	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-02-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979697
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 07:31 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0021	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:18	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-02-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979698
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 07:31 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0044	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:20	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-02-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979699
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 07:31 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0013 J	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:22	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-07-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979700
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05071

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C			ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2	0.2	1
11996	Tetrachloroethene	127-18-4	1.2	0.2	1
11996	Trichloroethene	79-01-6	0.3	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry SM 5310 C-2000			mg/l	mg/l	
00273	Total Organic Carbon	n.a.	3.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 03:39	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 03:39	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 22:21	Drew M Gerhart	1

Sample Description: BDC-05-07-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979701
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05072

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	3,100 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	20 U	20	20
07105	Ethane	74-84-0	20 U	20	20
07105	Ethene	74-85-1	20 U	20	20
07105	Methane	74-82-8	3,100	60	20
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	3.3	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 13:20	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 18:07	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 02:32	Alexandria M Lanager	1

Sample Description: BDC-05-07-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979702
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:06 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:27	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-07-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979703
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.00097 J	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:29	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-07-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979704
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:31	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-07-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979705
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:06 by JH The Boeing Company
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Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved					
06025	Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.00040 U	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:33	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-09-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979706
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:36 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05091

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.4	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	2.8	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	4.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 03:59	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 03:59	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 22:35	Drew M Gerhart	1

Sample Description: BDC-05-09-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979707
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:36 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05092

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	9.0	1.0	1
07105	Ethene	74-85-1	1.0 J	1.0	1
07105	Methane	74-82-8	4,400 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	5,300	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	4.3	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 13:35	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 18:24	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 03:10	Alexandria M Lanager	1

Sample Description: BDC-05-09-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979708
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:36 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:35	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-09-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979709
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:36 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0059	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705016A	05/12/2017 06:37	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705016	05/11/2017 16:10	JoElla L Rice	1

Sample Description: BDC-05-09-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979710
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:36 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:04	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-09-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979711
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 08:36 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0063	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:13	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-10-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979712
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

10051

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.3	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.8	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	6.0	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 04:19	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 04:19	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 22:49	Drew M Gerhart	1

Sample Description: BDC-05-10-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979713
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

10052

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	15		1.0	1
07105	Ethene	74-85-1	1.0 J		1.0	1
07105	Methane	74-82-8	3,700 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20 U		20	20
07105	Ethane	74-84-0	20 U		20	20
07105	Ethene	74-85-1	20 U		20	20
07105	Methane	74-82-8	4,000		60	20
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	1.7		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 14:11	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 18:41	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 03:47	Alexandria M Lanager	1

Sample Description: BDC-05-10-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979714
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:06 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:14	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-10-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979715
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:06 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0148	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:16	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-10-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979716
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:21	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-10-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979717
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0136	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:23	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-11-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979718
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:46 by JH

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MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

11051

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.8	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	9.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 04:40	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 04:40	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 23:03	Drew M Gerhart	1

Sample Description: BDC-05-11-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979719
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

11052

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	6.8		1.0	1
07105	Ethene	74-85-1	2.5 J		1.0	1
07105	Methane	74-82-8	7,700 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	50 U		50	50
07105	Ethane	74-84-0	50 U		50	50
07105	Ethene	74-85-1	50 U		50	50
07105	Methane	74-82-8	9,000		150	50
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30 U		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 14:28	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 18:58	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 04:25	Alexandria M Lanager	1

Sample Description: BDC-05-11-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979720
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:46 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:24	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-11-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979721
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:46 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0182	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:26	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-11-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979722
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:46 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:28	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-11-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979723
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 09:46 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0180	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705017A	05/15/2017 16:29	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705017	05/12/2017 05:14	James L Mertz	1

Sample Description: BDC-05-03-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979724
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:21 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

03051

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C		ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	1.4	0.2	1
11996	Trichloroethene	79-01-6	0.3	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry		SM 5310 C-2000		mg/l	
00273	Total Organic Carbon	n.a.	2.8	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171302AA	05/11/2017 05:00	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171302AA	05/11/2017 05:00	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 23:18	Drew M Gerhart	1

Sample Description: BDC-05-03-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979725
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:21 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

03052

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	3.0 U	3.0	1
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	7.2	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 14:45	Johanna C Kennedy	1
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 05:02	Alexandria M Lanager	1

Sample Description: BDC-05-03-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979726
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:21 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0027	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:23	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-03-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979727
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:21 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0027	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:32	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-03-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979728
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:21 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:33	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-03-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979729
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:21 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved					
06025	Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.00040 U	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:35	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-12-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979730
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:51 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

12051

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	8.1	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 20:02	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 20:02	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604B	05/10/2017 23:32	Drew M Gerhart	1

Sample Description: BDC-05-12-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979731
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:51 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

12052

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	2.4	J	1.0	1
07105	Ethene	74-85-1	1.0	U	1.0	1
07105	Methane	74-82-8	10,000	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	100	U	100	100
07105	Ethane	74-84-0	100	U	100	100
07105	Ethene	74-85-1	100	U	100	100
07105	Methane	74-82-8	11,000		300	100
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30	U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 15:02	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 19:15	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 06:17	Alexandria M Lanager	1

Sample Description: BDC-05-12-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979732
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:51 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:40	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-12-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979733
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:51 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0096	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:42	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-12-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979734
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:51 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:43	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-12-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979735
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 10:51 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0091	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:45	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-19-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979736
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 11:26 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05191

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.4	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	11.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 20:22	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 20:22	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 01:13	Drew M Gerhart	1

Sample Description: BDC-05-19-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979737
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 11:26 by JH

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Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05192

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	2.3	J	1.0	1
07105	Ethene	74-85-1	1.0	U	1.0	1
07105	Methane	74-82-8	13,000	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	100	U	100	100
07105	Ethane	74-84-0	100	U	100	100
07105	Ethene	74-85-1	100	U	100	100
07105	Methane	74-82-8	13,000		300	100
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.43	J	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171270001A	05/08/2017 15:18	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171270001A	05/08/2017 19:32	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 06:55	Alexandria M Lanager	1

Sample Description: BDC-05-19-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979738
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 11:26 by JH

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Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:47	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-19-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979739
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 11:26 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0204	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705018A	05/15/2017 18:48	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705018	05/14/2017 05:53	James L Mertz	1

Sample Description: BDC-05-19-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979740
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 11:26 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 11:46	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-19-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979741
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 11:26 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0132	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 11:55	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-13-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979742
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:01 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05131

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.1	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	11.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 20:43	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 20:43	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 01:28	Drew M Gerhart	1

Sample Description: BDC-05-13-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979743
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:01 by JH

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Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05132

CAT No.	Analysis Name	CAS Number	Result		Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	12		1.0	1
07105	Ethene	74-85-1	1.4	J	1.0	1
07105	Methane	74-82-8	11,000	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	100	U	100	100
07105	Ethane	74-84-0	100	U	100	100
07105	Ethene	74-85-1	100	U	100	100
07105	Methane	74-82-8	14,000		300	100
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30	U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 12:45	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 14:54	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17136972106A	05/17/2017 07:32	Alexandria M Lanager	1

Sample Description: BDC-05-13-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979744
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:01 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 11:56	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-13-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979745
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:01 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0271	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 11:58	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-13-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979746
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:01 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 12:03	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-13-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979747
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:01 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0271	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 12:05	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-24-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979748
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:41 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

524-1

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.4	ug/l 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	4.8	mg/l 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 21:03	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 21:03	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 01:42	Drew M Gerhart	1

Sample Description: BDC-05-24-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979749
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:41 by JH

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Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

524-2

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	3.7 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	5,100 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	5,900	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	1.5	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 13:03	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 15:13	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 10:40	Alexandria M Lanager	1

Sample Description: BDC-05-24-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979750
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:41 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 12:06	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-24-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979751
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:41 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0038	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 12:08	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-24-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979752
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:41 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 12:10	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-24-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979753
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 12:41 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0027	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705019A	05/16/2017 12:11	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705019	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-15-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979754
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 14:16 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05151

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.7	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	23.9	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 21:23	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 21:23	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 01:56	Drew M Gerhart	1

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Sample Description: BDC-05-15-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979755
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 14:16 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05152

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	17	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	9,600 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	10,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.41 J	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 13:22	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 15:32	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 11:18	Alexandria M Lanager	1

Sample Description: BDC-05-15-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979756
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 14:16 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:14	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-15-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979757
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 14:16 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0480	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:22	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-15-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979758
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 14:16 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:24	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-15-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979759
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 14:16 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0489	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:25	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-14-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979760
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 13:26 by JH

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PO Box 3707
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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05141

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.3	ug/1 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	21.8	mg/1 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 21:43	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 21:43	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 02:10	Drew M Gerhart	1

Sample Description: BDC-05-14-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979761
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 13:26 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05142

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	8.9	1.0	1
07105	Ethene	74-85-1	2.0 U	2.0	1
07105	Methane	74-82-8	11,000 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	100 U	100	100
07105	Ethane	74-84-0	100 U	100	100
07105	Ethene	74-85-1	100 U	100	100
07105	Methane	74-82-8	12,000	300	100

Reporting limits were raised due to interference from the sample matrix.

Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	3.8	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 13:40	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 15:50	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 11:55	Alexandria M Lanager	1

Sample Description: BDC-05-14-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979762
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 13:26 by JH

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Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:31	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-14-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979763
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 13:26 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0230	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:32	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-14-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979764
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 13:26 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:34	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-14-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979765
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 13:26 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0207	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:36	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-22-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979766
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:06 by JH

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MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05221

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	9.4	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.6	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	6.0	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 22:04	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 22:04	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 02:24	Drew M Gerhart	1

Sample Description: BDC-05-22-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979767
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:06 by JH

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PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05222

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 6.6	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 12:14	Alexandria M Lanager	1

Sample Description: BDC-05-22-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979768
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:06 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:37	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-22-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979769
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0280	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705020A	05/15/2017 17:39	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705020	05/12/2017 05:58	James L Mertz	1

Sample Description: BDC-05-22-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979770
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 14:51	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-22-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979771
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:06 by JH

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Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0298	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 14:59	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-20-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979772
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:51 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05201

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.2	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	12.9	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 22:24	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 22:24	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 02:38	Drew M Gerhart	1

Sample Description: BDC-05-20-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979773
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:51 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05202

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	4.3 J		1.0	1
07105	Ethene	74-85-1	2.3 J		1.0	1
07105	Methane	74-82-8	4,700 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20 U		20	20
07105	Ethane	74-84-0	20 U		20	20
07105	Ethene	74-85-1	20 U		20	20
07105	Methane	74-82-8	4,300		60	20
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	1.2		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 13:59	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 16:28	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 12:33	Alexandria M Lanager	1

Sample Description: BDC-05-20-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979774
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:51 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:01	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-20-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979775
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:51 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0271	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:03	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-20-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979776
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:51 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:08	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-20-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979777
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 15:51 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0264	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:09	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-17-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979778
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 16:36 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05171

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.9	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	19.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 22:45	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 22:45	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667605A	05/11/2017 02:53	Drew M Gerhart	1

Sample Description: BDC-05-17-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979779
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 16:36 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

517-2

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	13	1.0	1
07105	Ethene	74-85-1	2.0 U	2.0	1
07105	Methane	74-82-8	9,500 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	11,000	150	50

Reporting limits were raised due to interference from the sample matrix.

Wet Chemistry		EPA 300.0	mg/l	mg/l
00228	Sulfate	14808-79-8	0.30 U	0.30

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 14:36	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 16:47	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 12:51	Alexandria M Lanager	1

Sample Description: BDC-05-17-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979780
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 16:36 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:11	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-17-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979781
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 16:36 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0444	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:13	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-17-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979782
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 16:36 by JH The Boeing Company
PO Box 3707
Submitted: 05/06/2017 09:55 MC 1W-12
Reported: 05/18/2017 13:51 Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:15	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-17-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979783
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 16:36 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0368	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171300705021A	05/15/2017 15:16	Patrick J Engle	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171300705021	05/12/2017 06:06	James L Mertz	1

Sample Description: BDC-05-16-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979784
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 17:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

05161

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	17.0	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 19:01	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 19:01	Don V Viray	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17130667604A	05/10/2017 17:34	Drew M Gerhart	1

Sample Description: BDC-05-16-170504 Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979785
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 17:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55
Reported: 05/18/2017 13:51

05162

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	12	1.0	1
07105	Ethene	74-85-1	1.6 J	1.0	1
07105	Methane	74-82-8	8,100 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	9,100	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	171280032A	05/08/2017 11:50	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	171280032A	05/09/2017 17:06	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17136972106B	05/17/2017 08:10	Alexandria M Lanager	1

Sample Description: BDC-05-16-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979786
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 17:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171320705006A	05/16/2017 12:27	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171320705006	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-16-170504 Total Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979787
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 17:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0291	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171320705006A	05/16/2017 12:35	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171320705006	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-16-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979788
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 17:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	171320705006A	05/16/2017 12:40	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171320705006	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: BDC-05-16-170504 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979789
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017 17:06 by JH

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0269	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	171320705006A	05/16/2017 12:42	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	171320705006	05/15/2017 22:25	Annamaria Kuhns	1

Sample Description: TRIP BLANK Water
Boeing_DC:SWMU-17 s-ann

LL Sample # WW 8979790
LL Group # 1798197
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 05/04/2017

The Boeing Company
PO Box 3707
MC 1W-12
Seattle WA 98124

Submitted: 05/06/2017 09:55

Reported: 05/18/2017 13:51

S20TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H171341AA	05/14/2017 18:40	Don V Viray	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H171341AA	05/14/2017 18:40	Don V Viray	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: H171302AA	Sample number(s): 8979692, 8979694, 8979700, 8979706, 8979712, 8979718, 8979724	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Batch number: H171341AA	Sample number(s): 8979730, 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778, 8979784, 8979790	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 171270001A	Sample number(s): 8979695, 8979701, 8979707, 8979713, 8979719, 8979725, 8979731, 8979737	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
Batch number: 171280032A	Sample number(s): 8979743, 8979749, 8979755, 8979761, 8979773, 8979779, 8979785	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
	mg/l	mg/l
Batch number: 171300705016A	Sample number(s): 8979696-8979699, 8979702-8979705, 8979708-8979709	
Arsenic	0.00040 U	0.00040
Copper	0.00021 U	0.00021
Batch number: 171300705017A	Sample number(s): 8979710-8979711, 8979714-8979717, 8979720-8979723	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 171300705018A	Sample number(s): 8979726-8979729, 8979732-8979735, 8979738-8979739	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 171300705019A	Sample number(s): 8979740-8979741, 8979744-8979747, 8979750-8979753	
Arsenic	0.00040 U	0.00040

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

Method Blank (continued)

Analysis Name	Result	MDL
	mg/l	mg/l
Copper	0.00034 U	0.00034
Batch number: 171300705020A	Sample number(s): 8979756-8979759, 8979762-8979765, 8979768-8979769	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 171300705021A	Sample number(s): 8979770-8979771, 8979774-8979777, 8979780-8979783	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 171320705006A	Sample number(s): 8979786-8979789	
Arsenic	0.00040 U	0.00040
Copper	0.0016 J	0.00034
Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17130667604A	Sample number(s): 8979784	
Total Organic Carbon	1.0 U	1.0
Batch number: 17130667604B	Sample number(s): 8979692, 8979694, 8979700, 8979706, 8979712, 8979718, 8979724, 8979730	
Total Organic Carbon	1.0 U	1.0
Batch number: 17130667605A	Sample number(s): 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778	
Total Organic Carbon	1.0 U	1.0
Analysis Name	Result	MDL
	mg/l	mg/l
Batch number: 17136972106A	Sample number(s): 8979693, 8979695, 8979701, 8979707, 8979713, 8979719, 8979725, 8979731, 8979737, 8979743	
Sulfate	0.30 U	0.30
Batch number: 17136972106B	Sample number(s): 8979749, 8979755, 8979761, 8979767, 8979773, 8979779, 8979785	
Sulfate	0.30 U	0.30

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: H171302AA	Sample number(s): 8979692, 8979694, 8979700, 8979706, 8979712, 8979718, 8979724								
cis-1,2-Dichloroethene	5.00	5.29	5.00	5.10	106	102	80-120	4	30
Tetrachloroethene	5.00	5.18	5.00	5.24	104	105	80-120	1	30
Trichloroethene	5.00	5.06	5.00	4.95	101	99	80-120	2	30
Vinyl Chloride	5.00	4.42	5.00	4.87	88	97	62-128	10	30
Batch number: H171341AA	Sample number(s): 8979730, 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778, 8979784, 8979790								

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
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P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

LCS/LCSD (continued)

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
cis-1,2-Dichloroethene	5.00	5.26			105		80-120		
Tetrachloroethene	5.00	5.13			103		80-120		
Trichloroethene	5.00	4.87			97		80-120		
Vinyl Chloride	5.00	4.73			95		62-128		
	ug/l	ug/l	ug/l	ug/l					
Batch number: 171270001A	Sample number(s): 8979695,8979701,8979707,8979713,8979719,8979725,8979731,8979737								
Acetylene	51.1	43.96			86		61-148		
Ethane	58.4	55.08			94		85-115		
Ethene	60.8	55.85			92		83-115		
Methane	59.8	57.07			95		85-115		
Batch number: 171280032A	Sample number(s): 8979743,8979749,8979755,8979761,8979773,8979779,8979785								
Acetylene	51.1	43.07			84		61-148		
Ethane	58.4	51.09			87		85-115		
Ethene	60.8	51.88			85		83-115		
Methane	59.8	53.46			89		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 171300705016A	Sample number(s): 8979696-8979699,8979702-8979705,8979708-8979709								
Arsenic	0.0100	0.0103			103		85-115		
Copper	0.0500	0.0479			96		85-115		
Batch number: 171300705017A	Sample number(s): 8979710-8979711,8979714-8979717,8979720-8979723								
Arsenic	0.0100	0.0105			105		85-115		
Copper	0.0500	0.0516			103		85-115		
Batch number: 171300705018A	Sample number(s): 8979726-8979729,8979732-8979735,8979738-8979739								
Arsenic	0.0100	0.0104			104		85-115		
Copper	0.0500	0.0515			103		85-115		
Batch number: 171300705019A	Sample number(s): 8979740-8979741,8979744-8979747,8979750-8979753								
Arsenic	0.0100	0.0100			100		85-115		
Copper	0.0500	0.0504			101		85-115		
Batch number: 171300705020A	Sample number(s): 8979756-8979759,8979762-8979765,8979768-8979769								
Arsenic	0.0100	0.0115			115		85-115		
Copper	0.0500	0.0528			106		85-115		
Batch number: 171300705021A	Sample number(s): 8979770-8979771,8979774-8979777,8979780-8979783								
Arsenic	0.0100	0.0108			108		85-115		
Copper	0.0500	0.0528			106		85-115		
Batch number: 171320705006A	Sample number(s): 8979786-8979789								
Arsenic	0.0100	0.00965			97		85-115		
Copper	0.0500	0.0481			96		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17130667604A	Sample number(s): 8979784								

*- Outside of specification

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Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Total Organic Carbon	25	25.44			102		91-113		
Batch number: 17130667604B	Sample number(s): 8979692, 8979694, 8979700, 8979706, 8979712, 8979718, 8979724, 8979730								
Total Organic Carbon	25	25.44			102		91-113		
Batch number: 17130667605A	Sample number(s): 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778								
Total Organic Carbon	25	25.12			100		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17136972106A	Sample number(s): 8979693, 8979695, 8979701, 8979707, 8979713, 8979719, 8979725, 8979731, 8979737, 8979743								
Sulfate	7.50	7.60			101		90-110		
Batch number: 17136972106B	Sample number(s): 8979749, 8979755, 8979761, 8979767, 8979773, 8979779, 8979785								
Sulfate	7.50	7.60			101		90-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: H171341AA	Sample number(s): 8979730, 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778, 8979784, 8979790 UNSPK: 8979784									
cis-1,2-Dichloroethene	0.114	5.00	5.96	5.00	6.23	117	122*	80-120	4	30
Tetrachloroethene	0.2 U	5.00	6.14	5.00	6.12	123*	122*	80-120	0	30
Trichloroethene	0.2 U	5.00	5.66	5.00	5.81	113	116	80-120	3	30
Vinyl Chloride	1.33	5.00	7.04	5.00	7.11	114	115	62-128	1	30
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: 171270001A	Sample number(s): 8979695, 8979701, 8979707, 8979713, 8979719, 8979725, 8979731, 8979737 UNSPK: P974857									
Acetylene	1.0 U	51.1	42.63	51.1	42.17	83	83	61-148	1	20
Ethane	503.89	58.4	537.3	58.4	527.83	57 (2)	41 (2)	74-131	2	30
Ethene	1.0 U	60.8	63.18	60.8	61.99	104	102	72-133	2	30
Methane	18565.78	59.8	17638	59.8	17585.46	-1550 (2)	-1638 (2)	73-125	0	30
Batch number: 171280032A	Sample number(s): 8979743, 8979749, 8979755, 8979761, 8979773, 8979779, 8979785 UNSPK: 8979785									
Acetylene	1.0 U	51.1	49.3	51.1	45.75	96	90	61-148	7	20
Ethane	11.82	58.4	71.15	58.4	69.6	102	99	74-131	2	30
Ethene	1.58	60.8	72.63	60.8	68.28	117	110	72-133	6	30

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Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Methane	8119.65	59.8	7983.04	59.8	7694.49	-227 (2)	-710 (2)	73-125	4	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 171300705016A	Sample number(s): 8979696-8979699,8979702-8979705,8979708-8979709 UNSPK: 8979696, P979696									
Arsenic	0.00241	0.0100	0.0131			107		70-130		
Copper	0.00652	0.0500	0.0548			97		70-130		
Batch number: 171300705017A	Sample number(s): 8979710-8979711,8979714-8979717,8979720-8979723 UNSPK: 8979710, P979710									
Arsenic	0.00542	0.0100	0.0165			110		70-130		
Copper	0.00034 U	0.0500	0.0499			100		70-130		
Batch number: 171300705018A	Sample number(s): 8979726-8979729,8979732-8979735,8979738-8979739 UNSPK: 8979726, P979726									
Arsenic	0.00276	0.0100	0.0136			109		70-130		
Copper	0.00266	0.0500	0.0549			104		70-130		
Batch number: 171300705019A	Sample number(s): 8979740-8979741,8979744-8979747,8979750-8979753 UNSPK: 8979740, P979740									
Arsenic	0.0135	0.0100	0.0239			104		70-130		
Copper	0.00034 U	0.0500	0.0491			98		70-130		
Batch number: 171300705020A	Sample number(s): 8979756-8979759,8979762-8979765,8979768-8979769 UNSPK: 8979756, P979756									
Arsenic	0.0486	0.0100	0.0592			106 (2)		70-130		
Copper	0.000658	0.0500	0.0518			102		70-130		
Batch number: 171300705021A	Sample number(s): 8979770-8979771,8979774-8979777,8979780-8979783 UNSPK: 8979770, P979770									
Arsenic	0.0296	0.0100	0.0379			83		70-130		
Copper	0.00034 U	0.0500	0.0500			100		70-130		
Batch number: 171320705006A	Sample number(s): 8979786-8979789 UNSPK: 8979786, P979786									
Arsenic	0.0296	0.0100	0.0382			85		70-130		
Copper	0.00034 U	0.0500	0.0458			92		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17130667604A	Sample number(s): 8979784 UNSPK: 8979784									
Total Organic Carbon	17.05	10	27.24			102		64-148		
Batch number: 17130667604B	Sample number(s): 8979692,8979694,8979700,8979706,8979712,8979718,8979724,8979730 UNSPK: P983687									
Total Organic Carbon	97.16	50	150.14			106		64-148		

*- Outside of specification

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Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17130667605A	Sample number(s): 8979736, 8979742, 8979748, 8979754, 8979760, 8979766, 8979772, 8979778 UNSPK: P975635									
Total Organic Carbon	1.60	10	12.27			107		64-148		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17136972106A	Sample number(s): 8979693, 8979695, 8979701, 8979707, 8979713, 8979719, 8979725, 8979731, 8979737, 8979743 UNSPK: 8979693									
Sulfate	0.414	5.00	5.26			97		90-110		
Batch number: 17136972106B	Sample number(s): 8979749, 8979755, 8979761, 8979767, 8979773, 8979779, 8979785 UNSPK: 8979785									
Sulfate	0.30 U	5.00	5.24			105		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 171300705016A	Sample number(s): 8979696-8979699, 8979702-8979705, 8979708-8979709 BKG: 8979696, P979696			
Arsenic	0.00241	0.00250	4 (1)	20
Copper	0.00652	0.00643	1 (1)	20
Batch number: 171300705017A	Sample number(s): 8979710-8979711, 8979714-8979717, 8979720-8979723 BKG: 8979710, P979710			
Arsenic	0.00542	0.00572	5 (1)	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 171300705018A	Sample number(s): 8979726-8979729, 8979732-8979735, 8979738-8979739 BKG: 8979726, P979726			
Arsenic	0.00276	0.00257	7 (1)	20
Copper	0.00266	0.00271	2 (1)	20
Batch number: 171300705019A	Sample number(s): 8979740-8979741, 8979744-8979747, 8979750-8979753 BKG: 8979740, P979740			
Arsenic	0.0135	0.0137	2	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 171300705020A	Sample number(s): 8979756-8979759, 8979762-8979765, 8979768-8979769 BKG: 8979756, P979756			
Arsenic	0.0486	0.0481	1	20
Copper	0.000658	0.000604	9 (1)	20

*- Outside of specification

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(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 171300705021A	Sample number(s): 8979770-8979771,8979774-8979777,8979780-8979783 BKG: 8979770, P979770			
Arsenic	0.0296	0.0279	6	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 171320705006A	Sample number(s): 8979786-8979789 BKG: 8979786, P979786			
Arsenic	0.0296	0.0289	3	20
Copper	0.00034 U	0.000365	200* (1)	20
	mg/l	mg/l		
Batch number: 17130667604A	Sample number(s): 8979784 BKG: 8979784			
Total Organic Carbon	17.05	17.17	1	9
Batch number: 17130667604B	Sample number(s): 8979692,8979694,8979700,8979706,8979712,8979718,8979724,8979730 BKG: P983687			
Total Organic Carbon	97.16	97.24	0	9
Batch number: 17130667605A	Sample number(s): 8979736,8979742,8979748,8979754,8979760,8979766,8979772,8979778 BKG: P975635			
Total Organic Carbon	1.60	1.60	0 (1)	9
	mg/l	mg/l		
Batch number: 17136972106A	Sample number(s): 8979693,8979695,8979701,8979707,8979713,8979719,8979725,8979731,8979737,8979743 BKG: 8979693			
Sulfate	0.414	0.401	3 (1)	15
Batch number: 17136972106B	Sample number(s): 8979749,8979755,8979761,8979767,8979773,8979779,8979785 BKG: 8979785			
Sulfate	0.30 U	0.30 U	0 (1)	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H171302AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8979692	103	103	100	99
8979694	105	107	101	97
8979700	103	108	100	98
8979706	102	103	102	96
8979712	102	101	104	98
8979718	101	105	102	95

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P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H171302AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8979724	100	100	103	95
Blank	105	102	101	99
LCS	101	103	101	103
LCSD	99	99	103	102
Limits:	77-114	74-113	77-110	78-110

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H171341AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8979730	106	107	100	97
8979736	106	109	100	97
8979742	106	108	101	100
8979748	105	111	101	96
8979754	105	107	101	95
8979760	104	105	102	97
8979766	105	111	102	97
8979772	104	106	104	95
8979778	105	107	102	96
8979784	104	107	102	97
8979790	101	109	104	97
Blank	103	106	103	95
LCS	103	108	100	104
MS	99	103	103	103
MSD	99	106	101	104
Limits:	77-114	74-113	77-110	78-110

Analysis Name: AMEE by RSK-175
Batch number: 171270001A

	Propene
8979695	78
8979695DL	94
8979701	83
8979701DL	87
8979707	83
8979707DL	94
8979713	90
8979713DL	91
8979719	85
8979719DL	98
8979725	82
8979731	88
8979731DL	93
8979737	90

*- Outside of specification

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- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 05/18/2017 13:51

Group Number: 1798197

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: AMEE by RSK-175
Batch number: 171270001A

Propene	
8979737DL	86
Blank	92
LCS	91
MS	74
MSD	72

Limits: 44-123

Analysis Name: AMEE by RSK-175
Batch number: 171280032A

Propene	
8979743	85
8979743DL	89
8979749	87
8979749DL	85
8979755	83
8979755DL	89
8979761	83
8979761DL	89
8979773	85
8979773DL	93
8979779	86
8979779DL	94
8979785	81
8979785DL	86
Blank	98
LCS	99
MS	84
MSD	79

Limits: 44-123

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Client: Boeing

Delivery and Receipt Information

Delivery Method: SeaTac Arrival Timestamp: 05/06/2017 9:55
 Number of Packages: 3 Number of Projects: 1
 State/Province of Origin: WA

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCl
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Simon Nies (25112) at 11:45 on 05/06/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.0	DT	Wet	Y	Bagged	N
2	DT146	1.7	DT	Wet	Y	Bagged	N
3	DT146	0.6	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	none detected
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Laboratory Data Qualifiers:

- C - Result confirmed by reanalysis
- E - Concentration exceeds the calibration range
- J (or G, I, X) - estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
- P - Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
- U - Analyte was not detected at the value indicated
- V - Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference...
- W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods. Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Report Date: August 25, 2017

Project: Boeing_DC:SWMU-17 s-ann

Account #: 13419
Group Number: 1833148
State of Sample Origin: WA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/>. To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To The Boeing Company
Electronic Copy To Landau

Attn: Jennifer Parsons
Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364

SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Collection Information</u>	<u>ELLE#</u>
BDC-05-18-170801 Water	08/01/2017 08:46	9134821
BDC-05-18-170801 Water	08/01/2017 08:46	9134822
BDC-05-18-170801 Total Metals Water	08/01/2017 08:46	9134823
BDC-05-18-170801 Total Metals Water	08/01/2017 08:46	9134824
BDC-05-18-170801 Dissolved Metals Water	08/01/2017 08:46	9134825
BDC-05-18-170801 Dissolved Metals Water	08/01/2017 08:46	9134826
BDC-05-21-170801 Water	08/01/2017 09:46	9134827
BDC-05-21-170801 Water	08/01/2017 09:46	9134828
BDC-05-21-170801 Total Metals Water	08/01/2017 09:46	9134829
BDC-05-21-170801 Total Metals Water	08/01/2017 09:46	9134830
BDC-05-21-170801 Dissolved Metals Water	08/01/2017 09:46	9134831
BDC-05-21-170801 Dissolved Metals Water	08/01/2017 09:46	9134832
BDC-05-23-170801 Water	08/01/2017 10:21	9134833
BDC-05-23-170801 Water	08/01/2017 10:21	9134834
BDC-05-23-170801 Total Metals Water	08/01/2017 10:21	9134835
BDC-05-23-170801 Total Metals Water	08/01/2017 10:21	9134836
BDC-05-23-170801 Dissolved Metals Water	08/01/2017 10:21	9134837
BDC-05-23-170801 Dissolved Metals Water	08/01/2017 10:21	9134838
BDC-05-22-170801 Water	08/01/2017 10:56	9134839
BDC-05-22-170801 Water	08/01/2017 10:56	9134840
BDC-05-22-170801 Total Metals Water	08/01/2017 10:56	9134841
BDC-05-22-170801 Total Metals Water	08/01/2017 10:56	9134842
BDC-05-22-170801 Dissolved Metals Water	08/01/2017 10:56	9134843
BDC-05-22-170801 Dissolved Metals Water	08/01/2017 10:56	9134844
BDC-05-20-170801 Water	08/01/2017 11:31	9134845
BDC-05-20-170801 Water	08/01/2017 11:31	9134846
BDC-05-20-170801 Total Metals Water	08/01/2017 11:31	9134847
BDC-05-20-170801 Total Metals Water	08/01/2017 11:31	9134848
BDC-05-20-170801 Dissolved Metals Water	08/01/2017 11:31	9134849
BDC-05-20-170801 Dissolved Metals Water	08/01/2017 11:31	9134850
BDC-DUP2-170801 Water	08/01/2017 12:01	9134851
BDC-DUP2-170801 Water	08/01/2017 12:01	9134852
BDC-DUP2-170801 Total Metals Water	08/01/2017 12:01	9134853
BDC-DUP2-170801 Total Metals Water	08/01/2017 12:01	9134854
BDC-DUP2-170801 Dissolved Metals Water	08/01/2017 12:01	9134855
BDC-DUP2-170801 Dissolved Metals Water	08/01/2017 12:01	9134856
BDC-05-02-170801 Water	08/01/2017 12:11	9134857
BDC-05-02-170801 Water	08/01/2017 12:11	9134858
BDC-05-02-170801 Total Metals Water	08/01/2017 12:11	9134859
BDC-05-02-170801 Total Metals Water	08/01/2017 12:11	9134860
BDC-05-02-170801 Dissolved Metals Water	08/01/2017 12:11	9134861
BDC-05-02-170801 Dissolved Metals Water	08/01/2017 12:11	9134862
BDC-05-12-170801 Water	08/01/2017 13:01	9134863
BDC-05-12-170801 Water	08/01/2017 13:01	9134864
BDC-05-12-170801 Total Metals Water	08/01/2017 13:01	9134865
BDC-05-12-170801 Total Metals Water	08/01/2017 13:01	9134866
BDC-05-12-170801 Dissolved Metals Water	08/01/2017 13:01	9134867
BDC-05-12-170801 Dissolved Metals Water	08/01/2017 13:01	9134868

<u>Client Sample Description</u>	<u>Collection Information</u>	<u>ELLE#</u>
BDC-05-19-170801 Water	08/01/2017 13:31	9134869
BDC-05-19-170801 Water	08/01/2017 13:31	9134870
BDC-05-19-170801 Total Metals Water	08/01/2017 13:31	9134871
BDC-05-19-170801 Total Metals Water	08/01/2017 13:31	9134872
BDC-05-19-170801 Dissolved Metals Water	08/01/2017 13:31	9134873
BDC-05-19-170801 Dissolved Metals Water	08/01/2017 13:31	9134874
BDC-05-16-170801 Water	08/01/2017 14:16	9134875
BDC-05-16-170801 Water	08/01/2017 14:16	9134876
BDC-05-16-170801 Total Metals Water	08/01/2017 14:16	9134877
BDC-05-16-170801 Total Metals Water	08/01/2017 14:16	9134878
BDC-05-16-170801 Dissolved Metals Water	08/01/2017 14:16	9134879
BDC-05-16-170801 Dissolved Metals Water	08/01/2017 14:16	9134880
BDC-05-24-170801 Water	08/01/2017 14:51	9134881
BDC-05-24-170801 Water	08/01/2017 14:51	9134882
BDC-05-24-170801 Total Metals Water	08/01/2017 14:51	9134883
BDC-05-24-170801 Total Metals Water	08/01/2017 14:51	9134884
BDC-05-24-170801 Dissolved Metals Water	08/01/2017 14:51	9134885
BDC-05-24-170801 Dissolved Metals Water	08/01/2017 14:51	9134886
TRIP BLANK Water	08/01/2017	9134887

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Project Name: Boeing_DC:SWMU-17 s-ann
LL Group #: 1833148

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below. Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are included in this data set

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

For dual column analyses, the surrogate (for multi-surrogate tests, at least one surrogate) must be within the acceptance limits on at least one of the two columns.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**RSKSOP-175 modified, GC Miscellaneous****Sample #s: 9134852**

Due to interference from the methane present in the sample, the concentration reported for ethane in the undiluted analysis is estimated

Sample #s: 9134870

Due to interference from the methane present in the sample, the concentration reported for ethane in the undiluted analysis is estimated.

Batch #: 172160016A (Sample number(s): 9134822, 9134828, 9134846, 9134852, 9134858, 9134864, 9134870, 9134876, 9134882 UNSPK: 9134822)

The recovery(ies) for the following analyte(s) in the MS and/or MSD exceeded the acceptance window indicating a positive bias: Methane

EPA 200.8 rev 5.4, Metals

Batch #: 172150705004A (Sample number(s): 9134823-9134826, 9134829-9134832, 9134835-9134836 UNSPK: 9134823 BKG: 9134823)

The recovery(ies) for the following analyte(s) in the MS exceeded the acceptance window indicating a positive bias: Arsenic

EPA 200.8 rev 5.4, Metals Dissolved

Batch #: 172150705004A (Sample number(s): 9134823-9134826, 9134829-9134832, 9134835-9134836 UNSPK: 9134823 BKG: 9134823)

The recovery(ies) for the following analyte(s) in the MS exceeded the acceptance window indicating a positive bias: Arsenic

EPA 300.0, Wet Chemistry

Batch #: 17215120109A (Sample number(s): 9134882 UNSPK: P134222 BKG: P134222)

The recovery(ies) for the following analyte(s) in the MS were below the acceptance window: Sulfate

SM 5310 C-2000, Wet Chemistry

Batch #: 17215667602B (Sample number(s): 9134821, 9134833, 9134839, 9134845, 9134851, 9134857, 9134863, 9134869, 9134875, 9134881 UNSPK: 9134821 BKG: 9134821)

The recovery(ies) for the following analyte(s) in the MS were below the acceptance window: Total Organic Carbon

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Total Organic Carbon

August 28, 2017

Ms. Chris Kimmel
Landau Associates
130 2nd Avenue South
Edmonds, WA 98020

Dear Ms. Kimmel:

I am writing to inform you of revised analytical reports that are being issued for the following:

Project: Boeing_DC:SWMU-17 s-ann
Group No.: 1833148

ELLE Sample No.	Client Sample Identification	Collection Date
9134821	BDC-05-18-170801 Water	08/01/2017

The correction to the data affects the Total Organic Carbon analysis only.

In response to your inquiry regarding the data, it was determined that the total organic carbon data reported was incorrect. The sample was reanalyzed in duplicate and also as a spiked sample. The result of the rerun was the sample's result is 18.3 mg/l. The duplicate result is 18.6 mg/l, and the matrix spike sample recovery is 94%.

The revised analytical report reflects this correction and is enclosed.

You are a valued client and we apologize for any inconvenience that this incident may have caused. If you have any questions or require further assistance, please call me at 717-656-2300, Ext. 1575. We appreciate your business and look forward to continuing to serve your laboratory needs.

Sincerely,



Sandra J. Miller
Chemist
Instrumental Water Quality

SJM/mk
Enclosures

cc: Kay G Hower

REVISED

Sample Description: BDC-05-18-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134821
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 08:46 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-18

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	1.1	0.2	1
11996	Tetrachloroethene	127-18-4	1.9	0.2	1
11996	Trichloroethene	79-01-6	2.4	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	18.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 12:55	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 12:55	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	4	17235667603A	08/23/2017 19:00	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-18-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134822
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 08:46 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

MB-18

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	3,300 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	20 U	20	20
07105	Ethane	74-84-0	20 U	20	20
07105	Ethene	74-85-1	20 U	20	20
07105	Methane	74-82-8	3,900	60	20
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	5.2	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 13:09	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 12:26	Nicholas R Rossi	20
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 00:36	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-18-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134823
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 08:46 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 04:57	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-18-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134824
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 08:46 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0469	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:06	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-18-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134825
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 08:46 by JH

The Boeing Company

PO Box 3707

Submitted: 08/02/2017 09:50

MS 1W-12

Reported: 08/25/2017 13:26

Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:08	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-18-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134826
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 08:46 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0013 J	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:09	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-21-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134827
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 09:46 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.6	ug/1 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.5	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	13.9	mg/1 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 13:55	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 13:55	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602A	08/04/2017 00:49	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-21-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134828
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 09:46 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

MB-21

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	5.6		1.0	1
07105	Ethene	74-85-1	3.9 J		1.0	1
07105	Methane	74-82-8	4,200 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	20 U		20	20
07105	Ethane	74-84-0	20 U		20	20
07105	Ethene	74-85-1	20 U		20	20
07105	Methane	74-82-8	4,900		60	20
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	1.1		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 14:02	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 12:43	Nicholas R Rossi	20
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 00:18	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-21-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134829
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 09:46 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:14	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-21-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134830
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 09:46 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0094	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:16	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-21-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134831
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 09:46 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:18	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-21-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134832
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 09:46 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0085	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-23-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134833
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:21 by JH

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Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

VB-23

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.9	ug/1 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	6.7	mg/1 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 14:16	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 14:16	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 02:02	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-23-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134834
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:21 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

MB-23

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 4.7	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 01:29	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-23-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134835
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:21 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:21	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-23-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134836
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:21 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0169	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705004A	08/07/2017 05:23	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705004	08/04/2017 16:35	JoElla L Rice	1

REVISED

Sample Description: BDC-05-23-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134837
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:21 by JH

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Submitted: 08/02/2017 09:50

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Reported: 08/25/2017 13:26

Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-23-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134838
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:21 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0191	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:38	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-22-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134839
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:56 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-22

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	9.1	ug/1 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.7	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	6.3	mg/1 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 14:36	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 14:36	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 02:17	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-22-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134840
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:56 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

MB-22

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 1.8	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 01:47	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-22-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134841
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:56 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:40	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-22-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134842
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:56 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0316	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:42	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-22-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134843
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:56 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:47	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-22-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134844
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 10:56 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0297	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:49	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-20-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134845
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 11:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-20

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.9	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	12.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 14:57	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 14:57	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 02:31	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-20-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134846
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 11:31 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

MB-20

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	4.6 J		1.0	1
07105	Ethene	74-85-1	1.4 J		1.0	1
07105	Methane	74-82-8	5,500 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	50 U		50	50
07105	Ethane	74-84-0	50 U		50	50
07105	Ethene	74-85-1	50 U		50	50
07105	Methane	74-82-8	6,400		150	50
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30 U		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 14:21	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 13:01	Nicholas R Rossi	50
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 02:04	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-20-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134847
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 11:31 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:51	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-20-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134848
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 11:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0271	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:53	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-20-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134849
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 11:31 by JH

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Submitted: 08/02/2017 09:50

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Reported: 08/25/2017 13:26

Seattle WA 98124

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:55	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-20-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134850
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 11:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0268	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705005A	08/08/2017 04:57	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705005	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-DUP2-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134851
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:01 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-D2

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	10.1	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 15:17	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 15:17	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 02:45	Drew M Gerhart	1

Sample Description: BDC-DUP2-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134852
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:01 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

MB-D2

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0	U	1.0	1
07105	Ethane	74-84-0	9.1	J	1.0	1
07105	Ethene	74-85-1	1.0	U	1.0	1
07105	Methane	74-82-8	12,000	E	3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	5.0	U	5.0	5
07105	Ethane	74-84-0	9.9	J	5.0	5
07105	Ethene	74-85-1	5.0	U	5.0	5
07105	Methane	74-82-8	13,000	E	15	5
Trial ID: DL2						
07105	Acetylene	74-86-2	100	U	100	100
07105	Ethane	74-84-0	100	U	100	100
07105	Ethene	74-85-1	100	U	100	100
07105	Methane	74-82-8	14,000		300	100
Due to interference from the methane present in the sample, the concentration reported for ethane in the undiluted analysis is estimated						
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30	U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 14:39	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/09/2017 14:54	Nicholas R Rossi	5
07105	AMEE by RSK-175	RSKSOP-175 modified	3-DL2	172160016A	08/05/2017 13:19	Nicholas R Rossi	100
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 02:22	Hallie A Burnett	1

REVISED

Sample Description: BDC-DUP2-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134853
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:01 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:47	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-DUP2-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134854
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:01 by JH

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PO Box 3707
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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0178	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:48	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-DUP2-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134855
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:01 by JH

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PO Box 3707
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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:50	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-DUP2-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134856
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:01 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0127	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:55	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-02-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134857
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:11 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-02

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.3	0.2	1
11996	Tetrachloroethene	127-18-4	3.9	0.2	1
11996	Trichloroethene	79-01-6	2.5	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry	SM 5310 C-2000		mg/l	mg/l	
00273	Total Organic Carbon	n.a.	12.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 15:37	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 15:37	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 03:00	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-02-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134858
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:11 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

MB-02

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	8.2		1.0	1
07105	Ethene	74-85-1	1.0 U		1.0	1
07105	Methane	74-82-8	6,600 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	50 U		50	50
07105	Ethane	74-84-0	50 U		50	50
07105	Ethene	74-85-1	50 U		50	50
07105	Methane	74-82-8	8,000		150	50
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	18.4		1.5	5

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 14:57	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 13:36	Nicholas R Rossi	50
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 03:33	Hallie A Burnett	5

REVISED

Sample Description: BDC-05-02-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134859
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:11 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:38	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-02-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134860
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:11 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0119	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:57	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-02-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134861
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:11 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 05:59	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-02-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134862
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 12:11 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0085	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 06:00	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-12-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134863
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:01 by JH

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PO Box 3707
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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-12

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C ug/l					
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry SM 5310 C-2000 mg/l					
00273	Total Organic Carbon	n.a.	7.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 15:58	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 15:58	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 03:14	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-12-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134864
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:01 by JH

The Boeing Company
PO Box 3707
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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

MB-12

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	8.0	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	9,100 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	9,500	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 15:15	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 13:54	Nicholas R Rossi	50
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 03:51	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-12-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134865
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:01 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 06:02	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-12-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134866
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:01 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0107	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705006A	08/07/2017 06:04	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705006	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-12-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134867
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:01 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:16	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-12-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134868
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:01 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0094	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:25	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-19-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134869
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-19

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	10.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 16:18	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 16:18	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 03:28	Drew M Gerhart	1

Sample Description: BDC-05-19-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134870
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

MB-19

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	9.6 J		1.0	1
07105	Ethene	74-85-1	1.0 U		1.0	1
07105	Methane	74-82-8	13,000 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	5.0 U		5.0	5
07105	Ethane	74-84-0	9.3 J		5.0	5
07105	Ethene	74-85-1	5.0 U		5.0	5
07105	Methane	74-82-8	13,000 E		15	5
Trial ID: DL2						
07105	Acetylene	74-86-2	100 U		100	100
07105	Ethane	74-84-0	100 U		100	100
07105	Ethene	74-85-1	100 U		100	100
07105	Methane	74-82-8	15,000		300	100
Due to interference from the methane present in the sample, the concentration reported for ethane in the undiluted analysis is estimated.						
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	0.30 U		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 15:51	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/09/2017 15:12	Nicholas R Rossi	5
07105	AMEE by RSK-175	RSKSOP-175 modified	3-DL2	172160016A	08/05/2017 14:12	Nicholas R Rossi	100
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 04:08	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-19-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134871
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:31 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:27	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-19-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134872
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:31 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0172	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-19-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134873
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:34	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-19-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134874
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 13:31 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0124	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:35	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-16-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134875
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:16 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-16

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	12.7	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 16:38	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 16:38	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 03:59	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-16-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134876
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:16 by JH

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Submitted: 08/02/2017 09:50
Reported: 08/25/2017 13:26

MB-16

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	9.9	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	7,600 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	7,400	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 16:09	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 14:30	Nicholas R Rossi	50
00228	Sulfate	EPA 300.0	1	17215120209A	08/04/2017 04:26	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-16-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134877
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:16 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0028	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:37	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-16-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134878
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:16 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0309	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:39	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-16-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134879
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:16 by JH

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Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:40	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-16-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134880
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:16 by JH

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Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0290	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172150705007A	08/07/2017 04:42	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172150705007	08/04/2017 16:15	JoElla L Rice	1

REVISED

Sample Description: BDC-05-24-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134881
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:51 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-24

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles SW-846 8260C					
11996	cis-1,2-Dichloroethene	156-59-2	0.4	ug/1 0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry SM 5310 C-2000					
00273	Total Organic Carbon	n.a.	5.7	mg/1 1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 16:59	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 16:59	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17215667602B	08/04/2017 04:13	Drew M Gerhart	1

REVISED

Sample Description: BDC-05-24-170801 Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134882
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:51 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

MB-24

CAT No.	Analysis Name	CAS Number	Result	Method	Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l		ug/l	
07105	Acetylene	74-86-2	1.0 U		1.0	1
07105	Ethane	74-84-0	1.0 U		1.0	1
07105	Ethene	74-85-1	1.1 J		1.0	1
07105	Methane	74-82-8	7,200 E		3.0	1
Trial ID: DL						
07105	Acetylene	74-86-2	50 U		50	50
07105	Ethane	74-84-0	50 U		50	50
07105	Ethene	74-85-1	50 U		50	50
07105	Methane	74-82-8	11,000		150	50
Wet Chemistry		EPA 300.0	mg/l		mg/l	
00228	Sulfate	14808-79-8	1.3		0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	172160016A	08/04/2017 16:27	Nicholas R Rossi	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	172160016A	08/05/2017 14:47	Nicholas R Rossi	50
00228	Sulfate	EPA 300.0	1	17215120109A	08/03/2017 17:48	Hallie A Burnett	1

REVISED

Sample Description: BDC-05-24-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134883
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:51 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172160705002A	08/08/2017 05:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172160705002	08/07/2017 06:05	Lisa J Cooke	1

REVISED

Sample Description: BDC-05-24-170801 Total Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134884
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:51 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0030	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172160705002A	08/08/2017 05:03	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172160705002	08/07/2017 06:05	Lisa J Cooke	1

REVISED

Sample Description: BDC-05-24-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134885
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:51 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved					
06033	Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0020 U	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	172160705002A	08/08/2017 05:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172160705002	08/07/2017 06:05	Lisa J Cooke	1

REVISED

Sample Description: BDC-05-24-170801 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134886
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017 14:51 by JH

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0021	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	172160705002A	08/08/2017 05:18	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	172160705002	08/07/2017 06:05	Lisa J Cooke	1

REVISED

Sample Description: TRIP BLANK Water
Boeing_DC:SWMU-17 s-ann

ELLE Sample # WW 9134887
ELLE Group # 1833148
Account # 13419

Project Name: Boeing_DC:SWMU-17 s-ann

Collected: 08/01/2017

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Submitted: 08/02/2017 09:50

Reported: 08/25/2017 13:26

VB-TB

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS	Volatiles	SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H172191AA	08/07/2017 12:29	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H172191AA	08/07/2017 12:29	Kevin A Sposito	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: H172191AA	Sample number(s): 9134821,9134827,9134833,9134839,9134845,9134851,9134857,9134863,9134869,9134875,9134881,9134887	
cis-1,2-Dichloroethene	0.5 U	0.5
Tetrachloroethene	0.5 U	0.5
Trichloroethene	0.5 U	0.5
Vinyl Chloride	0.5 U	0.5
Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 172160016A	Sample number(s): 9134822,9134828,9134846,9134852,9134858,9134864,9134870,9134876,9134882	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
	mg/l	mg/l
Batch number: 172150705004A	Sample number(s): 9134823-9134826,9134829-9134832,9134835-9134836	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 172150705005A	Sample number(s): 9134837-9134838,9134841-9134844,9134847-9134850	
Arsenic	0.00040 U	0.00040
Copper	0.00021 U	0.00021
Batch number: 172150705006A	Sample number(s): 9134853-9134856,9134859-9134862,9134865-9134866	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 172150705007A	Sample number(s): 9134867-9134868,9134871-9134874,9134877-9134880	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 172160705002A	Sample number(s): 9134883-9134886	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17215667602A	Sample number(s): 9134827	
Total Organic Carbon	1.0 U	1.0

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

Method Blank (continued)

Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17215667602B	Sample number(s):	
	9134833, 9134839, 9134845, 9134851, 9134857, 9134863, 9134869, 9134875, 9134881	
Total Organic Carbon	1.0 U	1.0
Batch number: 17235667603A	Sample number(s): 9134821	
Total Organic Carbon	1.0 U	1.0
Analysis Name	Result	MDL
	mg/l	mg/l
Batch number: 17215120109A	Sample number(s): 9134882	
Sulfate	0.30 U	0.30
Batch number: 17215120209A	Sample number(s):	
	9134822, 9134828, 9134834, 9134840, 9134846, 9134852, 9134858, 9134864, 9134870, 9134876	
Sulfate	0.30 U	0.30

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: H172191AA	Sample number(s):								
	9134821, 9134827, 9134833, 9134839, 9134845, 9134851, 9134857, 9134863, 9134869, 9134875, 9134881, 9134887								
cis-1,2-Dichloroethene	5.00	4.91	5.00	4.84	98	97	80-120	2	30
Tetrachloroethene	5.00	4.93	5.00	4.96	99	99	80-120	1	30
Trichloroethene	5.00	4.67	5.00	4.73	93	95	80-120	1	30
Vinyl Chloride	5.00	3.79	5.00	3.85	76	77	62-128	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 172160016A	Sample number(s):								
	9134822, 9134828, 9134846, 9134852, 9134858, 9134864, 9134870, 9134876, 9134882								
Acetylene	51.1	53.62			105		61-148		
Ethane	58.4	58.11			100		85-115		
Ethene	60.8	60.23			99		83-115		
Methane	59.8	61.52			103		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 172150705004A	Sample number(s): 9134823-9134826, 9134829-9134832, 9134835-9134836								
Arsenic	0.0100	0.0101			101		85-115		
Copper	0.0500	0.0498			100		85-115		
Batch number: 172150705005A	Sample number(s): 9134837-9134838, 9134841-9134844, 9134847-9134850								
Arsenic	0.0100	0.00972			97		85-115		
Copper	0.0500	0.0502			100		85-115		

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 172150705006A	Sample number(s): 9134853-9134856, 9134859-9134862, 9134865-9134866								
Arsenic	0.0100	0.00944			94		85-115		
Copper	0.0500	0.0476			95		85-115		
Batch number: 172150705007A	Sample number(s): 9134867-9134868, 9134871-9134874, 9134877-9134880								
Arsenic	0.0100	0.00938			94		85-115		
Copper	0.0500	0.0483			97		85-115		
Batch number: 172160705002A	Sample number(s): 9134883-9134886								
Arsenic	0.0100	0.00912			91		85-115		
Copper	0.0500	0.0483			97		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17215667602A	Sample number(s): 9134827								
Total Organic Carbon	25	25.56			102		91-113		
Batch number: 17215667602B	Sample number(s): 9134833, 9134839, 9134845, 9134851, 9134857, 9134863, 9134869, 9134875, 9134881								
Total Organic Carbon	25	25.56			102		91-113		
Batch number: 17235667603A	Sample number(s): 9134821								
Total Organic Carbon	25	25.03			100		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17215120109A	Sample number(s): 9134882								
Sulfate	7.50	7.22			96		90-110		
Batch number: 17215120209A	Sample number(s): 9134822, 9134828, 9134834, 9134840, 9134846, 9134852, 9134858, 9134864, 9134870, 9134876								
Sulfate	7.50	7.35			98		90-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: H172191AA	Sample number(s): 9134821, 9134827, 9134833, 9134839, 9134845, 9134851, 9134857, 9134863, 9134869, 9134875, 9134881, 9134887 UNSPK: 9134821									
cis-1,2-Dichloroethene	1.12	5.00	6.06	5.00	5.80	99	94	80-120	4	30
Tetrachloroethene	1.94	5.00	6.74	5.00	6.83	96	98	80-120	1	30
Trichloroethene	2.44	5.00	7.06	5.00	6.93	92	90	80-120	2	30
Vinyl Chloride	0.2 U	5.00	4.09	5.00	3.86	82	77	62-128	6	30

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 172160016A	Sample number(s): 9134822,9134828,9134846,9134852,9134858,9134864,9134870,9134876,9134882 UNSPK: 9134822									
Acetylene	1.0 U	51.1	53.5	51.1	53.16	105	104	61-148	1	20
Ethane	1.0 U	58.4	60.02	58.4	59.48	103	102	74-131	1	30
Ethene	1.0 U	60.8	62.85	60.8	62.1	103	102	72-133	1	30
Methane	3303.66	59.8	4113.96	59.8	3771.47	1355	782 (2)	73-125	9	30
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 172150705004A	Sample number(s): 9134823-9134826,9134829-9134832,9134835-9134836 UNSPK: 9134823, P134823									
Arsenic	0.0406	0.0100	0.0544			138 (2)		70-130		
Copper	0.00139	0.0500	0.0488			95		70-130		
Batch number: 172150705005A	Sample number(s): 9134837-9134838,9134841-9134844,9134847-9134850 UNSPK: 9134837, P134837									
Arsenic	0.0189	0.0100	0.0289			101		70-130		
Copper	0.000230	0.0500	0.0501			100		70-130		
Batch number: 172150705006A	Sample number(s): 9134853-9134856,9134859-9134862,9134865-9134866 UNSPK: 9134859, P134859									
Arsenic	0.0120	0.0100	0.0228			108		70-130		
Copper	0.00109	0.0500	0.0492			96		70-130		
Batch number: 172150705007A	Sample number(s): 9134867-9134868,9134871-9134874,9134877-9134880 UNSPK: 9134867, P134867									
Arsenic	0.00952	0.0100	0.0196			101		70-130		
Copper	0.00034 U	0.0500	0.0483			97		70-130		
Batch number: 172160705002A	Sample number(s): 9134883-9134886 UNSPK: 9134884, P134884									
Arsenic	0.00305	0.0100	0.0125			95		70-130		
Copper	0.00034 U	0.0500	0.0477			95		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17215667602A	Sample number(s): 9134827 UNSPK: P134222									
Total Organic Carbon	21.68	10	35.93			142		64-148		
Batch number: 17215667602B	Sample number(s): 9134833,9134839,9134845,9134851,9134857,9134863,9134869,9134875,9134881 UNSPK: P134821									
Total Organic Carbon	29.27	10	32.25			30*		64-148		
Batch number: 17235667603A	Sample number(s): 9134821 UNSPK: 9134821									
Total Organic Carbon	18.3	10	27.67			94		64-148		
	mg/l	mg/l	mg/l	mg/l	mg/l					

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17215120109A Sulfate	Sample number(s): 1598.32	9134882 UNSPK: 2500	P134222 3807.25			88*		90-110		
Batch number: 17215120209A Sulfate	Sample number(s): 5.22	9134822, 9134828, 9134834, 9134840, 9134846, 9134852, 9134858, 9134864, 9134870, 9134876 UNSPK: 10	9134822 14.41			92		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 172150705004A Arsenic Copper	Sample number(s): 0.0406 0.00139	9134823-9134826, 9134829-9134832, 9134835-9134836 BKG: 9134823, P134823 0.0426 0.00137	5 1 (1)	20 20
Batch number: 172150705005A Arsenic Copper	Sample number(s): 0.0189 0.000230	9134837-9134838, 9134841-9134844, 9134847-9134850 BKG: 9134837, P134837 0.0193 0.000236	2 3 (1)	20 20
Batch number: 172150705006A Arsenic Copper	Sample number(s): 0.0120 0.00109	9134853-9134856, 9134859-9134862, 9134865-9134866 BKG: 9134859, P134859 0.0117 0.00123	3 12 (1)	20 20
Batch number: 172150705007A Arsenic Copper	Sample number(s): 0.00952 0.00034 U	9134867-9134868, 9134871-9134874, 9134877-9134880 BKG: 9134867, P134867 0.00958 0.00034 U	1 (1) 0 (1)	20 20
Batch number: 172160705002A Arsenic Copper	Sample number(s): 0.00305 0.00034 U	9134883-9134886 BKG: 9134884, P134884 0.00291 0.00034 U	4 (1) 0 (1)	20 20
Batch number: 17215667602A Total Organic Carbon	Sample number(s): 21.68	9134827 BKG: P134222 22.18	2	9

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 17215667602B	Sample number(s): 9134833,9134839,9134845,9134851,9134857,9134863,9134869,9134875,9134881 BKG: P134821			
Total Organic Carbon	29.27	14.37	68*	9
Batch number: 17235667603A	Sample number(s): 9134821 BKG: 9134821			
Total Organic Carbon	18.3	18.64	2	9
	mg/l	mg/l		
Batch number: 17215120109A	Sample number(s): 9134882 BKG: P134222			
Sulfate	1598.32	1686.06	5 (1)	15
Batch number: 17215120209A	Sample number(s): 9134822,9134828,9134834,9134840,9134846,9134852,9134858,9134864,9134870,9134876 BKG: 9134822			
Sulfate	5.22	5.29	1	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H172191AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9134821	100	107	102	97
9134827	97	103	105	97
9134833	98	102	105	95
9134839	98	101	104	96
9134845	97	104	105	97
9134851	98	102	104	98
9134857	100	107	103	97
9134863	99	104	104	97
9134869	98	101	104	96
9134875	99	106	103	97
9134881	98	101	105	97
9134887	99	106	105	98
Blank	97	104	105	98
LCS	96	101	103	103
LCSD	97	103	104	104
MS	98	106	102	102
MSD	92	93	106	99

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 08/25/2017 13:26

Group Number: 1833148

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H172191AA

Limits: 77-114 74-113 77-110 78-110

Analysis Name: AMEE by RSK-175
Batch number: 172160016A

	Propene
9134822	95
9134822DL	114
9134828	89
9134828DL	111
9134846	92
9134846DL	111
9134852	94
9134852DL	98
9134852DL2	108
9134858	93
9134858DL	113
9134864	91
9134864DL	111
9134870	98
9134870DL	98
9134870DL2	108
9134876	89
9134876DL	110
9134882	94
9134882DL	107
Blank	108
LCS	107
MS	93
MSD	92

Limits: 44-123

*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.



Client: BOEING

BOEING DEVELOPMENT CENTER

Delivery and Receipt Information

Delivery Method:	<u>UPS</u>	Arrival Timestamp:	<u>08/02/2017 9:50</u>
Number of Packages:	<u>2</u>	Number of Projects:	<u>2</u>
State/Province of Origin:	<u>WA</u>		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Nicole Reiff (25684) at 11:17 on 08/02/2017

Samples Chilled Details: BOEING DEVELOPMENT CENTER

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	2.6	DT	Wet	Y	Bagged	N
2	DT146	2.1	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	non-detect
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.

Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Report Date: November 21, 2017 03:47

Project: Boeing_DC:SWMU-17 s-ann

Account #: 13419
Group Number: 1872119
State of Sample Origin: WA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/> . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To The Boeing Company
Electronic Copy To Landau

Attn: Jennifer Parsons
Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364



SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
BDC-05-03-171106 Water	11/06/2017 07:06	9303767
BDC-05-03-171106 Water	11/06/2017 07:06	9303768
BDC-05-03-171106 Total Metals Water	11/06/2017 07:06	9303769
BDC-05-03-171106 Total Metals Water	11/06/2017 07:06	9303770
BDC-05-03-171106 Dissolved Metals Water	11/06/2017 07:06	9303771
BDC-05-03-171106 Dissolved Metals Water	11/06/2017 07:06	9303772
BDC-05-10-171106 Water	11/06/2017 07:51	9303773
BDC-05-10-171106 Water	11/06/2017 07:51	9303774
BDC-05-10-171106 Total Metals Water	11/06/2017 07:51	9303775
BDC-05-10-171106 Total Metals Water	11/06/2017 07:51	9303776
BDC-05-10-171106 Dissolved Metals Water	11/06/2017 07:51	9303777
BDC-05-10-171106 Dissolved Metals Water	11/06/2017 07:51	9303778
BDC-05-07-171106 Water	11/06/2017 09:21	9303779
BDC-05-07-171106 Water	11/06/2017 09:21	9303780
BDC-05-07-171106 Total Metals Water	11/06/2017 09:21	9303781
BDC-05-07-171106 Total Metals Water	11/06/2017 09:21	9303782
BDC-05-07-171106 Dissolved Metals Water	11/06/2017 09:21	9303783
BDC-05-07-171106 Dissolved Metals Water	11/06/2017 09:21	9303784
BDC-05-02-171106 Water	11/06/2017 10:01	9303785
BDC-05-02-171106 Water	11/06/2017 10:01	9303786
BDC-05-02-171106 Total Metals Water	11/06/2017 10:01	9303787
BDC-05-02-171106 Total Metals Water	11/06/2017 10:01	9303788
BDC-05-02-171106 Dissolved Metals Water	11/06/2017 10:01	9303789
BDC-05-02-171106 Dissolved Metals Water	11/06/2017 10:01	9303790
BDC-05-04-171106 Water	11/06/2017 10:41	9303791
BDC-05-04-171106 Water	11/06/2017 10:41	9303792
BDC-05-04-171106 Total Metals Water	11/06/2017 10:41	9303793
BDC-05-04-171106 Total Metals Water	11/06/2017 10:41	9303794
BDC-05-04-171106 Dissolved Metals Water	11/06/2017 10:41	9303795
BDC-05-04-171106 Dissolved Metals Water	11/06/2017 10:41	9303796
BDC-05-05-171106 Water	11/06/2017 11:06	9303797
BDC-05-05-171106 Water	11/06/2017 11:06	9303798
BDC-05-05-171106 Total Metals Water	11/06/2017 11:06	9303799
BDC-05-05-171106 Total Metals Water	11/06/2017 11:06	9303800
BDC-05-05-171106 Dissolved Metals Water	11/06/2017 11:06	9303801
BDC-05-05-171106 Dissolved Metals Water	11/06/2017 11:06	9303802
BDC-05-09-171106 Water	11/06/2017 11:51	9303803
BDC-05-09-171106 Water	11/06/2017 11:51	9303804
BDC-05-09-171106 Total Metals Water	11/06/2017 11:51	9303805
BDC-05-09-171106 Total Metals Water	11/06/2017 11:51	9303806
BDC-05-09-171106 Dissolved Metals Water	11/06/2017 11:51	9303807
BDC-05-09-171106 Dissolved Metals Water	11/06/2017 11:51	9303808
BDC-05-11-171106 Water	11/06/2017 12:21	9303809
BDC-05-11-171106 Water	11/06/2017 12:21	9303810
BDC-05-11-171106 Total Metals Water	11/06/2017 12:21	9303811



<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
BDC-05-11-171106 Total Metals Water	11/06/2017 12:21	9303812
BDC-05-11-171106 Dissolved Metals Water	11/06/2017 12:21	9303813
BDC-05-11-171106 Dissolved Metals Water	11/06/2017 12:21	9303814
BDC-05-12-171106 Water	11/06/2017 13:11	9303815
BDC-05-12-171106 Water	11/06/2017 13:11	9303816
BDC-05-12-171106 Total Metals Water	11/06/2017 13:11	9303817
BDC-05-12-171106 Total Metals Water	11/06/2017 13:11	9303818
BDC-05-12-171106 Dissolved Metals Water	11/06/2017 13:11	9303819
BDC-05-12-171106 Dissolved Metals Water	11/06/2017 13:11	9303820
BDC-05-08-171106 Water	11/06/2017 13:51	9303821
BDC-05-08-171106 Water	11/06/2017 13:51	9303822
BDC-05-08-171106 Total Metals Water	11/06/2017 13:51	9303823
BDC-05-08-171106 Total Metals Water	11/06/2017 13:51	9303824
BDC-05-08-171106 Dissolved Metals Water	11/06/2017 13:51	9303825
BDC-05-08-171106 Dissolved Metals Water	11/06/2017 13:51	9303826
BDC-05-19-171106 Water	11/06/2017 14:21	9303827
BDC-05-19-171106 Water	11/06/2017 14:21	9303828
BDC-05-19-171106 Total Metals Water	11/06/2017 14:21	9303829
BDC-05-19-171106 Total Metals Water	11/06/2017 14:21	9303830
BDC-05-19-171106 Dissolved Metals Water	11/06/2017 14:21	9303831
BDC-05-19-171106 Dissolved Metals Water	11/06/2017 14:21	9303832
BDC-05-13-171106 Water	11/06/2017 15:01	9303833
BDC-05-13-171106 Water	11/06/2017 15:01	9303834
BDC-05-13-171106 Total Metals Water	11/06/2017 15:01	9303835
BDC-05-13-171106 Total Metals Water	11/06/2017 15:01	9303836
BDC-05-13-171106 Dissolved Metals Water	11/06/2017 15:01	9303837
BDC-05-13-171106 Dissolved Metals Water	11/06/2017 15:01	9303838
BDC-05-14-171106 Water	11/06/2017 15:31	9303839
BDC-05-14-171106 Water	11/06/2017 15:31	9303840
BDC-05-14-171106 Total Metals Water	11/06/2017 15:31	9303841
BDC-05-14-171106 Total Metals Water	11/06/2017 15:31	9303842
BDC-05-14-171106 Dissolved Metals Water	11/06/2017 15:31	9303843
BDC-05-14-171106 Dissolved Metals Water	11/06/2017 15:31	9303844
Trip Blank Water	11/06/2017	9303845

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Project Name: Boeing_DC:SWMU-17 s-ann
ELLE Group #: 1872119

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below.

Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set.

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

For dual column analyses, the surrogate (for multi-surrogate tests, at least one surrogate) must be within the acceptance limits on at least one of the two columns.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 200.8 rev 5.4, Metals**

Batch #: 173120705006A (Sample number(s): 9303769-9303772, 9303775-9303778, 9303781-9303782
UNSPK: 9303769 BKG: 9303769)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Copper

Batch #: 173120705007A (Sample number(s): 9303783-9303784, 9303787-9303790, 9303793-9303796
UNSPK: 9303783 BKG: 9303783)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Arsenic, Copper

EPA 200.8 rev 5.4, Metals Dissolved

Batch #: 173120705006A (Sample number(s): 9303769-9303772, 9303775-9303778, 9303781-9303782
UNSPK: 9303769 BKG: 9303769)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Copper

Batch #: 173120705007A (Sample number(s): 9303783-9303784, 9303787-9303790, 9303793-9303796
UNSPK: 9303783 BKG: 9303783)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Arsenic, Copper

Batch #: 173120705011A (Sample number(s): 9303842-9303844 UNSPK: 9303843 BKG: 9303843)

The duplicate RPD for the following analyte(s) exceeded the acceptance window: Copper

EPA 300.0, Wet Chemistry

Batch #: 17311987113B (Sample number(s): 9303792 UNSPK: P302555 BKG: P302555)

The recovery(ies) for the following analyte(s) in the MS exceeded the acceptance window indicating a positive bias: Sulfate, Nitrate Nitrogen

Sample Description: BDC-05-03-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303767
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	7.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 21:03	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 21:03	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 20:19	Drew M Gerhart	1

Sample Description: BDC-05-03-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303768
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	3.4 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	7,200 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	10,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 15:08	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 17:09	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120215A	11/15/2017 23:04	Hallie A Burnett	1

Sample Description: BDC-05-03-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303769
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0047	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:07	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-03-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303770
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0118	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-03-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303771
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-03-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303772
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0092	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-10-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303773
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.6	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	5.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 21:24	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 21:24	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 20:32	Drew M Gerhart	1

Sample Description: BDC-05-10-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303774
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	12	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	5,200 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	6,200	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	1.3	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 15:25	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 17:44	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 00:35	Hallie A Burnett	1

Sample Description: BDC-05-10-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303775
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:24	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-10-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303776
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0138	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-10-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303777
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:27	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-10-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303778
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 07:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0113	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-07-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303779
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 09:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.7	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	33.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 21:44	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 21:44	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 20:45	Drew M Gerhart	1

Sample Description: BDC-05-07-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303780
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 09:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.9 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	5,600 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	6,900	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	1.5	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 15:42	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 18:01	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 01:36	Hallie A Burnett	1

Sample Description: BDC-05-07-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303781
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 09:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:31	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-07-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303782
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 09:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0059	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705006A	11/16/2017 14:32	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-07-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303783
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 09:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:12	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-07-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303784
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 09:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0053	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705007A	11/18/2017 13:06	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303785
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.3	0.2	1
11996	Tetrachloroethene	127-18-4	1.3	0.2	1
11996	Trichloroethene	79-01-6	3.6	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	10.5	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 22:05	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 22:05	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 20:58	Drew M Gerhart	1

Sample Description: BDC-05-02-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303786
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	3.5 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	7,500 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	10,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	13.0	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 15:59	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 18:18	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 02:06	Hallie A Burnett	1

Sample Description: BDC-05-02-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303787
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals					
		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:22	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303788
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0134	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:24	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303789
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-02-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303790
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0114	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:31	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-04-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303791
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:41

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	1.1	0.2	1
11996	Tetrachloroethene	127-18-4	0.3	0.2	1
11996	Trichloroethene	79-01-6	0.3	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	9.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 22:25	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 22:25	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 21:12	Drew M Gerhart	1

Sample Description: BDC-05-04-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303792
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:41

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	4,500 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	5,900	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00368	Nitrate Nitrogen	14797-55-8	0.050 U	0.050	1
00228	Sulfate	14808-79-8	2.7	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 16:34	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 18:35	Johanna C Kennedy	50
00368	Nitrate Nitrogen	EPA 300.0	1	17311987113B	11/08/2017 05:35	Clinton M Wilson	1
00228	Sulfate	EPA 300.0	1	17311987113B	11/08/2017 05:35	Clinton M Wilson	1

Sample Description: BDC-05-04-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303793
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:41

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:33	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-04-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303794
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:41

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0118	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:35	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-04-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303795
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:41

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:36	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-04-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303796
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 10:41

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0097	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705007A	11/17/2017 05:38	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-05-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303797
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.5	0.2	1
11996	Trichloroethene	79-01-6	1.0	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	2.7	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 22:45	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 22:45	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 21:39	Drew M Gerhart	1

Sample Description: BDC-05-05-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303798
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 39.0	mg/l 3.0	10

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 02:52	Hallie A Burnett	10

Sample Description: BDC-05-05-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303799
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0035	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:33	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-05-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303800
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.00076 J	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:42	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-05-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303801
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
06033	Metals Dissolved Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0022	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:43	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-05-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303802
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.00040 U	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173140705002A	11/16/2017 19:28	Bradley M Berlot	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173140705002	11/13/2017 00:05	Denise L Trimby	1

Sample Description: BDC-05-09-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303803
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.2	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	3.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 23:05	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 23:05	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 21:53	Drew M Gerhart	1

Sample Description: BDC-05-09-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303804
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	8.7	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	4,500 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	20 U	20	20
07105	Ethane	74-84-0	20 U	20	20
07105	Ethene	74-85-1	20 U	20	20
07105	Methane	74-82-8	4,400	60	20
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.65 J	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 16:51	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 18:52	Johanna C Kennedy	20
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 03:07	Hallie A Burnett	1

Sample Description: BDC-05-09-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303805
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:45	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-09-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303806
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0053	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:50	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-09-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303807
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:52	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-09-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303808
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 11:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0050	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:54	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-11-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303809
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 12:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	7.4	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 23:26	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 23:26	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 22:06	Drew M Gerhart	1

Sample Description: BDC-05-11-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303810
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 12:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	5.1	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	8,300 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	10,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 17:08	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 19:14	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 03:38	Hallie A Burnett	1

Sample Description: BDC-05-11-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303811
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 12:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:28	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-11-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303812
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 12:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0121	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:37	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-11-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303813
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 12:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705008A	11/17/2017 04:56	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705008	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-11-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303814
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 12:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0111	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:39	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-12-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303815
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	7.0	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 23:46	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 23:46	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603A	11/14/2017 22:19	Drew M Gerhart	1

Sample Description: BDC-05-12-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303816
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.6 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	9,700 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	12,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 17:25	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 19:31	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 04:38	Hallie A Burnett	1

Sample Description: BDC-05-12-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303817
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:41	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-12-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303818
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0050	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:46	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-12-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303819
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:48	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-12-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303820
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0048	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:50	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-08-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303821
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	5.1	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 00:06	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 00:06	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/14/2017 23:12	Drew M Gerhart	1

Sample Description: BDC-05-08-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303822
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 0.90 J	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 05:09	Hallie A Burnett	1

Sample Description: BDC-05-08-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303823
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:52	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-08-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303824
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0087	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:54	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-08-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303825
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
06033	Metals Dissolved Copper	EPA 200.8 rev 5.4 7440-50-8	mg/l 0.0042	mg/l 0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705009A	11/13/2017 09:55	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705009	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-08-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303826
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 13:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0082	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-19-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303827
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 14:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	9.3	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 00:27	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 00:27	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/14/2017 23:25	Drew M Gerhart	1

Sample Description: BDC-05-19-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303828
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 14:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.5 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	11,000 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	100 U	100	100
07105	Ethane	74-84-0	100 U	100	100
07105	Ethene	74-85-1	100 U	100	100
07105	Methane	74-82-8	15,000	300	100
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.45 J	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 17:42	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 19:49	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17319120215A	11/16/2017 05:39	Hallie A Burnett	1

Sample Description: BDC-05-19-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303829
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 14:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:34	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-19-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303830
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 14:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0064	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:36	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-19-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303831
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 14:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:38	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-19-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303832
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 14:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0041	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:43	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-13-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303833
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.1	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	18.5	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 00:47	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 00:47	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/14/2017 23:38	Drew M Gerhart	1

Sample Description: BDC-05-13-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303834
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	7.0	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	10,000 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	14,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 17:59	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 20:06	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17319120206A	11/17/2017 00:37	Hallie A Burnett	1

Sample Description: BDC-05-13-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303835
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:45	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-13-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303836
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0299	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:46	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-13-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303837
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:01

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:48	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-13-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303838
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:01

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0304	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:50	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-14-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303839
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.7	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	19.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 01:07	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 01:07	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/15/2017 00:06	Drew M Gerhart	1

Sample Description: BDC-05-14-171106 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303840
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:31

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	3.6 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	11,000 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	100 U	100	100
07105	Ethane	74-84-0	100 U	100	100
07105	Ethene	74-85-1	100 U	100	100
07105	Methane	74-82-8	14,000	300	100
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	3.8	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173120018A	11/08/2017 18:21	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173120018A	11/09/2017 20:23	Johanna C Kennedy	100
00228	Sulfate	EPA 300.0	1	17319120206A	11/17/2017 01:09	Hallie A Burnett	1

Sample Description: BDC-05-14-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303841
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705010A	11/16/2017 13:51	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705010	11/10/2017 06:00	James L Mertz	1

Sample Description: BDC-05-14-171106 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303842
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:31

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0197	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705011A	11/17/2017 01:54	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705011	11/10/2017 05:24	James L Mertz	1

Sample Description: BDC-05-14-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303843
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173120705011A	11/17/2017 01:44	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705011	11/10/2017 05:24	James L Mertz	1

Sample Description: BDC-05-14-171106 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303844
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017 15:31

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0197	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173120705011A	11/17/2017 01:55	Sarah L Burt	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173120705011	11/10/2017 05:24	James L Mertz	1

Sample Description: Trip Blank Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9303845
ELLE Group #: 1872119
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/07/2017 09:30
Collection Date/Time: 11/06/2017

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/15/2017 20:43	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/15/2017 20:43	Matthew S Krause	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result ug/l	LOQ ug/l
Batch number: H173191AA	Sample number(s): 9303767,9303773,9303779,9303785,9303791,9303797,9303803,9303809,9303815,9303821,9303827,9303833,9303839,9303845	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Analysis Name	Result ug/l	MDL ug/l
Batch number: 173120018A	Sample number(s): 9303768,9303774,9303780,9303786,9303792,9303804,9303810,9303816,9303828,9303834,9303840	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
Batch number: 173120705006A	mg/l	mg/l
Batch number: 173120705006A	Sample number(s): 9303769-9303772,9303775-9303778,9303781-9303782	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 173120705007A	Sample number(s): 9303783-9303784,9303787-9303790,9303793-9303796	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 173120705008A	Sample number(s): 9303799-9303801,9303805-9303808,9303813	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 173120705009A	Sample number(s): 9303811-9303812,9303814,9303817-9303820,9303823-9303825	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 173120705010A	Sample number(s): 9303826,9303829-9303832,9303835-9303838,9303841	
Arsenic	0.00040 U	0.00040
Copper	0.00034 J	0.00034
Batch number: 173120705011A	Sample number(s): 9303842-9303844	
Arsenic	0.00040 U	0.00040
Copper	0.00021 U	0.00021
Batch number: 173140705002A	Sample number(s): 9303802	

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

Method Blank (continued)

Analysis Name	Result	MDL
	mg/l	mg/l
Arsenic	0.00040 U	0.00040
Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17318667603A Total Organic Carbon	Sample number(s): 9303767,9303773,9303779,9303785,9303791,9303797,9303803,9303809,9303815 1.0 U	1.0
Batch number: 17318667603B Total Organic Carbon	Sample number(s): 9303821,9303827,9303833,9303839 1.0 U	1.0
Analysis Name	Result	MDL
	mg/l	mg/l
Batch number: 17311987113B Nitrate Nitrogen	Sample number(s): 9303792 0.050 U	0.050
Sulfate	0.30 U	0.30
Batch number: 17319120206A Sulfate	Sample number(s): 9303834,9303840 0.30 U	0.30
Batch number: 17319120215A Sulfate	Sample number(s): 9303768,9303774,9303780,9303786,9303798,9303804,9303810,9303816,9303822,9303828 0.30 U	0.30

LCS/LCSD

Analysis Name	LCS Spike Added ug/l	LCS Conc ug/l	LCSD Spike Added ug/l	LCSD Conc ug/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: H173191AA	Sample number(s): 9303767,9303773,9303779,9303785,9303791,9303797,9303803,9303809,9303815,9303821,9303827,9303833,9303839,9303845								
cis-1,2-Dichloroethene	5.00	5.06	5.00	4.99	101	100	80-120	2	30
Tetrachloroethene	5.00	4.67	5.00	4.68	93	94	80-120	0	30
Trichloroethene	5.00	4.82	5.00	4.73	96	95	80-120	2	30
Vinyl Chloride	5.00	4.91	5.00	4.85	98	97	63-133	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 173120018A	Sample number(s): 9303768,9303774,9303780,9303786,9303792,9303804,9303810,9303816,9303828,9303834,9303840								
Acetylene	51.1	45.04	51.1	44.91	88	88	82-115	0	20
Ethane	58.4	58.42	58.4	59.01	100	101	85-115	1	20
Ethene	60.8	59.86	60.8	60.66	98	100	83-115	1	20
Methane	59.8	60.41	59.8	61.89	101	104	85-115	2	20

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

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Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: 173120705006A	Sample number(s): 9303769-9303772,9303775-9303778,9303781-9303782								
Arsenic	0.0100	0.00990			99		85-115		
Copper	0.0500	0.0505			101		85-115		
Batch number: 173120705007A	Sample number(s): 9303783-9303784,9303787-9303790,9303793-9303796								
Arsenic	0.0100	0.00983			98		85-115		
Copper	0.0500	0.0486			97		85-115		
Batch number: 173120705008A	Sample number(s): 9303799-9303801,9303805-9303808,9303813								
Arsenic	0.0100	0.00994			99		85-115		
Copper	0.0500	0.0487			97		85-115		
Batch number: 173120705009A	Sample number(s): 9303811-9303812,9303814,9303817-9303820,9303823-9303825								
Arsenic	0.0100	0.00963			96		85-115		
Copper	0.0500	0.0498			100		85-115		
Batch number: 173120705010A	Sample number(s): 9303826,9303829-9303832,9303835-9303838,9303841								
Arsenic	0.0100	0.0108			108		85-115		
Copper	0.0500	0.0527			105		85-115		
Batch number: 173120705011A	Sample number(s): 9303842-9303844								
Arsenic	0.0100	0.0106			106		85-115		
Copper	0.0500	0.0518			104		85-115		
Batch number: 173140705002A	Sample number(s): 9303802								
Arsenic	0.0100	0.00907	0.0100	0.0110	91	110	85-115	19	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17318667603A	Sample number(s): 9303767,9303773,9303779,9303785,9303791,9303797,9303803,9303809,9303815								
Total Organic Carbon	25	26.41			106		91-113		
Batch number: 17318667603B	Sample number(s): 9303821,9303827,9303833,9303839								
Total Organic Carbon	25	26.41			106		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17311987113B	Sample number(s): 9303792								
Nitrate Nitrogen	0.750	0.717	0.750	0.721	96	96	90-110	1	20
Sulfate	7.50	7.16	7.50	7.16	95	95	90-110	0	20
Batch number: 17319120206A	Sample number(s): 9303834,9303840								
Sulfate	7.50	7.49			100		90-110		
Batch number: 17319120215A	Sample number(s): 9303768,9303774,9303780,9303786,9303798,9303804,9303810,9303816,9303822,9303828								
Sulfate	7.50	7.50			100		90-110		

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 173120705006A	Sample number(s): 9303769-9303772,9303775-9303778,9303781-9303782 UNSPK: 9303769, P303769									
Arsenic	0.0109	0.0100	0.0209			101		70-130		
Copper	0.00470	0.0500	0.0552			101		70-130		
Batch number: 173120705007A	Sample number(s): 9303783-9303784,9303787-9303790,9303793-9303796 UNSPK: 9303783, P303783									
Arsenic	0.00350	0.0100	0.0144			109		70-130		
Copper	0.000515	0.0500	0.0483			95		70-130		
Batch number: 173120705008A	Sample number(s): 9303799-9303801,9303805-9303808,9303813 UNSPK: 9303799, P303799									
Arsenic	0.00144	0.0100	0.0114			99		70-130		
Copper	0.00348	0.0500	0.0533			100		70-130		
Batch number: 173120705009A	Sample number(s): 9303811-9303812,9303814,9303817-9303820,9303823-9303825 UNSPK: 9303811, P303811									
Arsenic	0.0124	0.0100	0.0222			98		70-130		
Copper	0.000494	0.0500	0.0492			97		70-130		
Batch number: 173120705010A	Sample number(s): 9303826,9303829-9303832,9303835-9303838,9303841 UNSPK: 9303826, P303826									
Arsenic	0.00816	0.0100	0.0197			115		70-130		
Copper	0.00034 U	0.0500	0.0511			102		70-130		
Batch number: 173120705011A	Sample number(s): 9303842-9303844 UNSPK: 9303843, P303843									
Arsenic	0.0202	0.0100	0.0296			94		70-130		
Copper	0.000487	0.0500	0.0499			99		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17318667603A	Sample number(s): 9303767,9303773,9303779,9303785,9303791,9303797,9303803,9303809,9303815 UNSPK: P307993									
Total Organic Carbon	1.0 U	10	10.82			108		91-113		
Batch number: 17318667603B	Sample number(s): 9303821,9303827,9303833,9303839 UNSPK: P307996									
Total Organic Carbon	3.67	10	14.55			109		91-113		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17311987113B	Sample number(s): 9303792 UNSPK: P302555									
Nitrate Nitrogen	8.36	2.50	11.52			126*		90-110		
Sulfate	15.86	25	43.78			112*		90-110		
Batch number: 17319120206A	Sample number(s): 9303834,9303840 UNSPK: P305752									
Sulfate	622.94	1000	1556.71			93		90-110		

*- Outside of specification

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Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 17319120215A	Sample number(s): 9303768,9303774,9303780,9303786,9303798,9303804,9303810,9303816,9303822,9303828 UNSPK: 9303768									
Sulfate	0.30 U	5.00	5.06			101		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 173120705006A	Sample number(s): 9303769-9303772,9303775-9303778,9303781-9303782 BKG: 9303769, P303769			
Arsenic	0.0109	0.0120	10	20
Copper	0.00470	0.00731	43* (1)	20
Batch number: 173120705007A	Sample number(s): 9303783-9303784,9303787-9303790,9303793-9303796 BKG: 9303783, P303783			
Arsenic	0.00350	0.00431	21* (1)	20
Copper	0.000515	0.000717	33* (1)	20
Batch number: 173120705008A	Sample number(s): 9303799-9303801,9303805-9303808,9303813 BKG: 9303799, P303799			
Arsenic	0.00144	0.00133	8 (1)	20
Copper	0.00348	0.00327	6 (1)	20
Batch number: 173120705009A	Sample number(s): 9303811-9303812,9303814,9303817-9303820,9303823-9303825 BKG: 9303811, P303811			
Arsenic	0.0124	0.0130	5	20
Copper	0.000494	0.000473	4 (1)	20
Batch number: 173120705010A	Sample number(s): 9303826,9303829-9303832,9303835-9303838,9303841 BKG: 9303826, P303826			
Arsenic	0.00816	0.00948	15 (1)	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 173120705011A	Sample number(s): 9303842-9303844 BKG: 9303843, P303843			
Arsenic	0.0202	0.0188	7	20
Copper	0.000487	0.000310	44* (1)	20
	mg/l	mg/l		
Batch number: 17318667603A	Sample number(s): 9303767,9303773,9303779,9303785,9303791,9303797,9303803,9303809,9303815 BKG: P307993			
Total Organic Carbon	1.0 U	1.0 U	0 (1)	9
Batch number: 17318667603B	Sample number(s): 9303821,9303827,9303833,9303839 BKG: P307996			
Total Organic Carbon	3.67	3.62	1 (1)	9

*- Outside of specification

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Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 17311987113B	Sample number(s): 9303792 BKG: P302555			
Nitrate Nitrogen	8.36	8.43	1	15
Sulfate	15.86	15.97	1 (1)	15
Batch number: 17319120206A	Sample number(s): 9303834,9303840 BKG: P305752			
Sulfate	622.94	632.44	2 (1)	15
Batch number: 17319120215A	Sample number(s): 9303768,9303774,9303780,9303786,9303798,9303804,9303810,9303816,9303822,9303828 BKG: 9303768			
Sulfate	0.30 U	0.30 U	0 (1)	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H173191AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9303767	100	99	102	98
9303773	98	95	104	97
9303779	97	100	102	99
9303785	98	99	102	97
9303791	102	101	100	98
9303797	101	99	99	97
9303803	103	103	99	98
9303809	100	101	101	97
9303815	96	100	102	96
9303821	100	99	102	98
9303827	99	102	102	98
9303833	99	101	101	97
9303839	101	100	103	99
9303845	97	102	104	97
Blank	99	97	100	96
LCS	101	103	101	100
LCSD	99	99	100	100

*- Outside of specification

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P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 03:47

Group Number: 1872119

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H173191AA

Limits: 80-120 80-120 80-120 80-120

Analysis Name: AMEE by RSK-175
Batch number: 173120018A

Propene

9303768	78
9303768DL	105
9303774	85
9303774DL	101
9303780	81
9303780DL	99
9303786	77
9303786DL	104
9303792	78
9303792DL	101
9303804	84
9303804DL	104
9303810	82
9303810DL	103
9303816	88
9303816DL	108
9303828	84
9303828DL	100
9303834	83
9303834DL	105
9303840	82
9303840DL	99
Blank	102
LCS	98
LCSD	100

Limits: 44-123

*- Outside of specification

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Boeing Chain of Custody



Lancaster Laboratories

Acct. # 13419 Group # 1872119 Sample # 1303767-815

For Eurofins Lancaster Laboratories use only. Please print. Instructions on reverse side correspond.

1 Client Information

Site Location: Tukwila, WA
 Site Project: Boeing DC Regional Gov Project
 Site Program#: SWMU-17/0025217-099-039
 Boeing PM: Sen Parsons
 Consultant Contact: Chris Kimmel
 Report To: C. Kimmel, J. Parsons
 Invoice To: Boeing EHS Other (specify):
 Sampler: Jonathan Alverta # of Coolers: 2

4 Analyses Requested

PF, TE, Cd, Cu, Cr (826)	AMFE (PSK-175W)	TCC (415.1)	Sulfate (300)	Nitrate (300)	T/D Arsenic/Leptin (2008)
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5 Remarks/Comments

4 Dissolved metals samples were been Field filtered 48-hr hold time

2 Sample Identification

Sample ID	Collected		Matrix	No. of Containers
	Date	Time		
BDC-05-03-171106	11/6/17	706	AQ	11
BDC-05-10-171106	11/6/17	757	AQ	11
BDC-05-07-171106	11/6/17	921	AQ	11
BDC-05-02-171106	11/6/17	1001	AQ	11
BDC-05-04-171106	11/6/17	1041	AQ	11
BDC-05-05-171106	11/6/17	1106	AQ	9
BDC-05-09-171106	11/6/17	1151	AQ	11
BDC-05-11-171106	11/6/17	1221	AQ	11
BDC-05-12-171106	11/6/17	1311	AQ	11
BDC-05-08-171106	11/6/17	1351	AQ	9
BDC-05-14-171106	11/6/17	1421	AQ	11
BDC-05-13-171106	11/6/17	1501	AQ	11
BDC-05-14-171106	11/6/17	1531	AQ	11
TRTP BLANKS	-	-	AQ	4

6 Turnaround Time Requested (please circle)

Standard 72 hour 48 hour 5 day 4 day 24 hour

Date needed: _____

4

Analyses Requested	Received by:	Date/Time	Relinquished by:	Date/Time
PF, TE, Cd, Cu, Cr (826)	[Signature]	11/6/17	[Signature]	11/6/17
AMFE (PSK-175W)	[Signature]	11/6/17	[Signature]	11/6/17
TCC (415.1)	[Signature]	11/6/17	[Signature]	11/6/17
Sulfate (300)	[Signature]	11/6/17	[Signature]	11/6/17
Nitrate (300)	[Signature]	11/6/17	[Signature]	11/6/17
T/D Arsenic/Leptin (2008)	[Signature]	11/6/17	[Signature]	11/6/17

7

Received by: [Signature] Date/Time: 11/7/17 09:30

Relinquished by: [Signature] Date/Time: 11/7/17 09:30

Temperature upon Receipt: 0.8 ± 2.2 °C

Custody Seals Intact?: Yes No



Client: Boeing

Delivery and Receipt Information

Delivery Method:	<u>UPS</u>	Arrival Timestamp:	<u>11/07/2017 9:30</u>
Number of Packages:	<u>2</u>	Number of Projects:	<u>1</u>
State/Province of Origin:	<u>WA</u>		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace \geq 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Nicole Reiff (25684) at 10:04 on 11/07/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	0.8	DT	Wet	Y	Bagged	N
2	DT146	2.2	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	non-detect
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.

Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.



ANALYSIS REPORT

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

The Boeing Company
PO Box 3707
MS 1W-12
Seattle WA 98124

Report Date: November 21, 2017 07:04

Project: Boeing_DC:SWMU-17 s-ann

Account #: 13419
Group Number: 1872858
State of Sample Origin: WA

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at <http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/> . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To The Boeing Company
Electronic Copy To Landau

Attn: Jennifer Parsons
Attn: Chris Kimmel

Respectfully Submitted,



Kay Hower

(717) 556-7364



SAMPLE INFORMATION

<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
BDC-DUP3-171107 Water	11/07/2017 10:00	9306639
BDC-DUP3-171107 Water	11/07/2017 10:00	9306640
BDC-DUP3-171107 Total Metals Water	11/07/2017 10:00	9306641
BDC-DUP3-171107 Total Metals Water	11/07/2017 10:00	9306642
BDC-DUP3-171107 Dissolved Metals Water	11/07/2017 10:00	9306643
BDC-DUP3-171107 Dissolved Metals Water	11/07/2017 10:00	9306644
BDC-05-23-171107 Water	11/07/2017 10:21	9306645
BDC-05-23-171107 Water	11/07/2017 10:21	9306646
BDC-05-23-171107 Total Metals Water	11/07/2017 10:21	9306647
BDC-05-23-171107 Total Metals Water	11/07/2017 10:21	9306648
BDC-05-23-171107 Dissolved Metals Water	11/07/2017 10:21	9306649
BDC-05-23-171107 Dissolved Metals Water	11/07/2017 10:21	9306650
BDC-05-18-171107 Water	11/07/2017 10:51	9306651
BDC-05-18-171107 Water	11/07/2017 10:51	9306652
BDC-05-18-171107 Total Metals Water	11/07/2017 10:51	9306653
BDC-05-18-171107 Total Metals Water	11/07/2017 10:51	9306654
BDC-05-18-171107 Dissolved Metals Water	11/07/2017 10:51	9306655
BDC-05-18-171107 Dissolved Metals Water	11/07/2017 10:51	9306656
BDC-05-21-171107 Water	11/07/2017 11:31	9306657
BDC-05-21-171107 Water	11/07/2017 11:31	9306658
BDC-05-21-171107 Total Metals Water	11/07/2017 11:31	9306659
BDC-05-21-171107 Total Metals Water	11/07/2017 11:31	9306660
BDC-05-21-171107 Dissolved Metals Water	11/07/2017 11:31	9306661
BDC-05-21-171107 Dissolved Metals Water	11/07/2017 11:31	9306662
BDC-05-20-171107 Water	11/07/2017 12:06	9306663
BDC-05-20-171107 Water	11/07/2017 12:06	9306664
BDC-05-20-171107 Total Metals Water	11/07/2017 12:06	9306665
BDC-05-20-171107 Total Metals Water	11/07/2017 12:06	9306666
BDC-05-20-171107 Dissolved Metals Water	11/07/2017 12:06	9306667
BDC-05-20-171107 Dissolved Metals Water	11/07/2017 12:06	9306668
BDC-05-22-171107 Water	11/07/2017 12:41	9306669
BDC-05-22-171107 Water	11/07/2017 12:41	9306670
BDC-05-22-171107 Total Metals Water	11/07/2017 12:41	9306671
BDC-05-22-171107 Total Metals Water	11/07/2017 12:41	9306672
BDC-05-22-171107 Dissolved Metals Water	11/07/2017 12:41	9306673
BDC-05-22-171107 Dissolved Metals Water	11/07/2017 12:41	9306674
BDC-05-17-171107 Water	11/07/2017 13:16	9306675
BDC-05-17-171107 Water	11/07/2017 13:16	9306676
BDC-05-17-171107 Total Metals Water	11/07/2017 13:16	9306677
BDC-05-17-171107 Total Metals Water	11/07/2017 13:16	9306678
BDC-05-17-171107 Dissolved Metals Water	11/07/2017 13:16	9306679
BDC-05-17-171107 Dissolved Metals Water	11/07/2017 13:16	9306680
BDC-05-16-171107 Water	11/07/2017 13:46	9306681
BDC-05-16-171107 Water	11/07/2017 13:46	9306682
BDC-05-16-171107 Total Metals Water	11/07/2017 13:46	9306683



<u>Client Sample Description</u>	<u>Sample Collection Date/Time</u>	<u>ELLE#</u>
BDC-05-16-171107 Total Metals Water	11/07/2017 13:46	9306684
BDC-05-16-171107 Dissolved Metals Water	11/07/2017 13:46	9306685
BDC-05-16-171107 Dissolved Metals Water	11/07/2017 13:46	9306686
BDC-05-15-171107 Water	11/07/2017 14:36	9306687
BDC-05-15-171107 Water	11/07/2017 14:36	9306688
BDC-05-15-171107 Total Metals Water	11/07/2017 14:36	9306689
BDC-05-15-171107 Total Metals Water	11/07/2017 14:36	9306690
BDC-05-15-171107 Dissolved Metals Water	11/07/2017 14:36	9306691
BDC-05-15-171107 Dissolved Metals Water	11/07/2017 14:36	9306692
BDC-05-24-171107 Water	11/07/2017 15:11	9306693
BDC-05-24-171107 Water	11/07/2017 15:11	9306694
BDC-05-24-171107 Total Metals Water	11/07/2017 15:11	9306695
BDC-05-24-171107 Total Metals Water	11/07/2017 15:11	9306696
BDC-05-24-171107 Dissolved Metals Water	11/07/2017 15:11	9306697
BDC-05-24-171107 Dissolved Metals Water	11/07/2017 15:11	9306698
TRIP BLANKS Water	11/07/2017	9306699

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Project Name: Boeing_DC:SWMU-17 s-ann
ELLE Group #: 1872858

General Comments:

See the Laboratory Sample Analysis Record section of the Analysis Report for the method references.

All QC met criteria unless otherwise noted in an Analysis Specific Comment below.

Refer to the QC Summary for specific values and acceptance criteria.

Project specific QC samples are not included in this data set.

Matrix QC may not be reported if site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

Surrogate recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in an Analysis Specific Comment below.

For dual column analyses, the surrogate (for multi-surrogate tests, at least one surrogate) must be within the acceptance limits on at least one of the two columns.

The samples were received at the appropriate temperature and in accordance with the chain of custody unless otherwise noted.

Analysis Specific Comments:**EPA 200.8 rev 5.4, Metals**

Batch #: 173130705007A (Sample number(s): 9306690-9306692, 9306695-9306698 UNSPK: 9306690 BKG: 9306690)

The recovery(ies) for the following analyte(s) in the MS exceeded the acceptance window indicating a positive bias: Arsenic

EPA 200.8 rev 5.4, Metals Dissolved

Batch #: 173130705007A (Sample number(s): 9306690-9306692, 9306695-9306698 UNSPK: 9306690 BKG: 9306690)

The recovery(ies) for the following analyte(s) in the MS exceeded the acceptance window indicating a positive bias: Arsenic

Sample Description: BDC-DUP3-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306639
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:00

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.2	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	8.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 01:27	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 01:27	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/15/2017 00:59	Drew M Gerhart	1

Sample Description: BDC-DUP3-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306640
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified		ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.3 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	6,500 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	8,700	150	50
Wet Chemistry		EPA 300.0		mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 12:28	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 20:57	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 04:51	Zachary W Enck	1

Sample Description: BDC-DUP3-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306641
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:00

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-DUP3-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306642
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0288	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173180705002A	11/18/2017 06:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173180705002	11/15/2017 06:25	Lisa J Cooke	1

Sample Description: BDC-DUP3-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306643
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:00

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:20	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-DUP3-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306644
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:00

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0274	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173180705002A	11/18/2017 06:31	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173180705002	11/15/2017 06:25	Lisa J Cooke	1

Sample Description: BDC-05-23-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306645
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	2.6	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.8	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	7.5	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 01:47	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 01:47	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/15/2017 01:13	Drew M Gerhart	1

Sample Description: BDC-05-23-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306646
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
00228	Wet Chemistry Sulfate	EPA 300.0 14808-79-8	mg/l 2.0	mg/l 0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 04:00	Zachary W Enck	1

Sample Description: BDC-05-23-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306647
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:10	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-23-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306648
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0245	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173180705002A	11/18/2017 06:41	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173180705002	11/15/2017 06:25	Lisa J Cooke	1

Sample Description: BDC-05-23-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306649
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:21

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:25	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-23-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306650
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:21

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0248	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:27	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306651
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles					
		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	2.6	0.2	1
11996	Tetrachloroethene	127-18-4	0.6	0.2	1
11996	Trichloroethene	79-01-6	1.7	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry					
		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	3.9	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 02:08	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 02:08	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/15/2017 01:26	Drew M Gerhart	1

Sample Description: BDC-05-18-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306652
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.0 U	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	5,400 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	7,200	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	1.3	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 12:45	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 21:14	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 05:08	Zachary W Enck	1

Sample Description: BDC-05-18-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306653
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06033	Copper	7440-50-8	0.0037	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:29	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306654
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.112	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:31	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306655
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:51

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:32	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-18-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306656
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 10:51

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0027	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:34	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306657
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 11:31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles					
		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.9	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.2	0.2	1
Wet Chemistry					
		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	13.2	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 02:28	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 02:28	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667603B	11/15/2017 01:39	Drew M Gerhart	1

Sample Description: BDC-05-21-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306658
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 11:31

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	2.5 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	4,700 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	5,800	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	1.3	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 13:02	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 21:31	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 05:25	Zachary W Enck	1

Sample Description: BDC-05-21-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306659
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 11:31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705004A	11/18/2017 09:36	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705004	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306660
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 11:31

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0109	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306661
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 11:31

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:35	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-21-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306662
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 11:31

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0113	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:37	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-20-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306663
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	1.1	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	7.9	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 02:48	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 02:48	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667604A	11/15/2017 03:13	Drew M Gerhart	1

Sample Description: BDC-05-20-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306664
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.3 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	7,000 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	8,700	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 13:20	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 21:49	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 06:16	Zachary W Enck	1

Sample Description: BDC-05-20-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306665
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals					
		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:38	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-20-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306666
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0273	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:43	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-20-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306667
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:06

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:45	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-20-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306668
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:06

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0269	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:47	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-22-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306669
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:41

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	6.7	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	5.9	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173191AA	11/16/2017 03:09	Matthew S Krause	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173191AA	11/16/2017 03:09	Matthew S Krause	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667604A	11/15/2017 03:27	Drew M Gerhart	1

Sample Description: BDC-05-22-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306670
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:41

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 06:33	Zachary W Enck	1

Sample Description: BDC-05-22-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306671
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:41

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:49	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-22-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306672
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:41

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0206	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:50	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-22-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306673
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:41

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705005A	11/18/2017 08:52	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705005	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-22-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306674
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 12:41

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0208	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 09:50	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-17-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306675
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:16

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.8	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	15.8	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173211AA	11/17/2017 12:00	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173211AA	11/17/2017 12:00	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667604A	11/15/2017 03:40	Drew M Gerhart	1

Sample Description: BDC-05-17-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306676
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:16

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	7.6	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	9,400 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	11,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 13:37	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 22:06	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 06:50	Zachary W Enck	1

Sample Description: BDC-05-17-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306677
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:16

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 09:58	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-17-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306678
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:16

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0333	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:00	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-17-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306679
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:16

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:02	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-17-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306680
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:16

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0325	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:07	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306681
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:46

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.7	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	11.6	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173211AA	11/17/2017 12:21	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173211AA	11/17/2017 12:21	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667604A	11/15/2017 03:53	Drew M Gerhart	1

Sample Description: BDC-05-16-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306682
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:46

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	4.0 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	7,400 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	9,500	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 13:54	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 22:23	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 07:07	Zachary W Enck	1

Sample Description: BDC-05-16-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306683
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:46

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:09	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306684
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:46

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0214	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:10	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306685
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:46

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:12	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-16-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306686
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 13:46

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
06025	Metals Dissolved Arsenic	EPA 200.8 rev 5.4 7440-38-2	mg/l 0.0201	mg/l 0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:14	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-15-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306687
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 14:36

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.3	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	25.1	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173211AA	11/17/2017 12:41	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173211AA	11/17/2017 12:41	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667604A	11/15/2017 04:07	Drew M Gerhart	1

Sample Description: BDC-05-15-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306688
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 14:36

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	11	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	6,700 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	8,700	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 14:29	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 22:40	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 07:24	Zachary W Enck	1

Sample Description: BDC-05-15-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306689
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 14:36

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705006A	11/18/2017 10:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705006	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-15-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306690
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 14:36

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals	EPA 200.8 rev 5.4		mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0526	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:06	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-15-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306691
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 14:36

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:15	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-15-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306692
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 14:36

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0528	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:17	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306693
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 15:11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.5	0.2	1
Wet Chemistry		SM 5310 C-2000	mg/l	mg/l	
00273	Total Organic Carbon	n.a.	8.4	1.0	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173211AA	11/17/2017 13:01	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173211AA	11/17/2017 13:01	Kevin A Sposito	1
00273	Total Organic Carbon	SM 5310 C-2000	1	17318667604A	11/15/2017 04:20	Drew M Gerhart	1

Sample Description: BDC-05-24-171107 Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306694
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 15:11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC Miscellaneous		RSKSOP-175 modified	ug/l	ug/l	
07105	Acetylene	74-86-2	1.0 U	1.0	1
07105	Ethane	74-84-0	1.3 J	1.0	1
07105	Ethene	74-85-1	1.0 U	1.0	1
07105	Methane	74-82-8	9,400 E	3.0	1
Trial ID: DL					
07105	Acetylene	74-86-2	50 U	50	50
07105	Ethane	74-84-0	50 U	50	50
07105	Ethene	74-85-1	50 U	50	50
07105	Methane	74-82-8	12,000	150	50
Wet Chemistry		EPA 300.0	mg/l	mg/l	
00228	Sulfate	14808-79-8	0.30 U	0.30	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
07105	AMEE by RSK-175	RSKSOP-175 modified	1	173130011A	11/09/2017 14:52	Johanna C Kennedy	1
07105	AMEE by RSK-175	RSKSOP-175 modified	2-DL	173130011A	11/09/2017 22:57	Johanna C Kennedy	50
00228	Sulfate	EPA 300.0	1	17320249117A	11/18/2017 07:41	Zachary W Enck	1

Sample Description: BDC-05-24-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306695
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 15:11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:19	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-171107 Total Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306696
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 15:11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
Metals		EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.0016 J	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:24	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306697
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submission Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 15:11

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
Metals Dissolved		EPA 200.8 rev 5.4	mg/l	mg/l	
06033	Copper	7440-50-8	0.0020 U	0.0020	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06033	Copper	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:26	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: BDC-05-24-171107 Dissolved Metals Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306698
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017 15:11

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
	Metals Dissolved	EPA 200.8 rev 5.4	mg/l	mg/l	
06025	Arsenic	7440-38-2	0.00064 J	0.00040	1

Sample Comments

State of Washington Lab Certification No. C457
This sample was field filtered for dissolved metals.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06025	Arsenic	EPA 200.8 rev 5.4	1	173130705007A	11/18/2017 06:28	Choon Y Tian	1
07050	ICP/MS EPA-600 Digest	EPA 200.8 rev 5.4	1	173130705007	11/09/2017 22:00	Annamaria Kuhns	1

Sample Description: TRIP BLANKS Water
Boeing_DC:SWMU-17 s-ann

The Boeing Company
ELLE Sample #: WW 9306699
ELLE Group #: 1872858
Matrix: Water

Project Name: Boeing_DC:SWMU-17 s-ann

Submittal Date/Time: 11/08/2017 09:45
Collection Date/Time: 11/07/2017

CAT No.	Analysis Name	CAS Number	Result	Limit of Quantitation	Dilution Factor
GC/MS Volatiles		SW-846 8260C	ug/l	ug/l	
11996	cis-1,2-Dichloroethene	156-59-2	0.2 U	0.2	1
11996	Tetrachloroethene	127-18-4	0.2 U	0.2	1
11996	Trichloroethene	79-01-6	0.2 U	0.2	1
11996	Vinyl Chloride	75-01-4	0.2 U	0.2	1

Sample Comments

State of Washington Lab Certification No. C457

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
11996	8260C VC, TCE, PCE, cis1,2-DCE	SW-846 8260C	1	H173211AA	11/17/2017 11:40	Kevin A Sposito	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	H173211AA	11/17/2017 11:40	Kevin A Sposito	1

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 07:04

Group Number: 1872858

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	LOQ
	ug/l	ug/l
Batch number: H173191AA	Sample number(s): 9306639,9306645,9306651,9306657,9306663,9306669	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Batch number: H173211AA	Sample number(s): 9306675,9306681,9306687,9306693,9306699	
cis-1,2-Dichloroethene	0.2 U	0.2
Tetrachloroethene	0.2 U	0.2
Trichloroethene	0.2 U	0.2
Vinyl Chloride	0.2 U	0.2
Analysis Name	Result	MDL
	ug/l	ug/l
Batch number: 173130011A	Sample number(s): 9306640,9306652,9306658,9306664,9306676,9306682,9306688,9306694	
Acetylene	1.0 U	1.0
Ethane	1.0 U	1.0
Ethene	1.0 U	1.0
Methane	3.0 U	3.0
	mg/l	mg/l
Batch number: 173130705004A	Sample number(s): 9306641,9306643,9306647,9306649-9306650,9306653-9306656,9306659	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 173130705005A	Sample number(s): 9306660-9306662,9306665-9306668,9306671-9306673	
Arsenic	0.00048 J	0.00040
Copper	0.00034 U	0.00034
Batch number: 173130705006A	Sample number(s): 9306674,9306677-9306680,9306683-9306686,9306689	
Arsenic	0.00065 J	0.00040
Copper	0.00034 U	0.00034
Batch number: 173130705007A	Sample number(s): 9306690-9306692,9306695-9306698	
Arsenic	0.00040 U	0.00040
Copper	0.00034 U	0.00034
Batch number: 173180705002A	Sample number(s): 9306642,9306644,9306648	
Arsenic	0.00040 U	0.00040
Analysis Name	Result	LOQ
	mg/l	mg/l

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 07:04

Group Number: 1872858

Method Blank (continued)

Analysis Name	Result	LOQ
	mg/l	mg/l
Batch number: 17318667603B	Sample number(s): 9306639,9306645,9306651,9306657	
Total Organic Carbon	1.0 U	1.0
Batch number: 17318667604A	Sample number(s): 9306663,9306669,9306675,9306681,9306687,9306693	
Total Organic Carbon	1.0 U	1.0
Analysis Name	Result	MDL
	mg/l	mg/l
Batch number: 17320249117A	Sample number(s): 9306640,9306646,9306652,9306658,9306664,9306670,9306676,9306682,9306688,9306694	
Sulfate	0.30 U	0.30

LCS/LCSD

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l					
Batch number: H173191AA	Sample number(s): 9306639,9306645,9306651,9306657,9306663,9306669								
cis-1,2-Dichloroethene	5.00	5.06	5.00	4.99	101	100	80-120	2	30
Tetrachloroethene	5.00	4.67	5.00	4.68	93	94	80-120	0	30
Trichloroethene	5.00	4.82	5.00	4.73	96	95	80-120	2	30
Vinyl Chloride	5.00	4.91	5.00	4.85	98	97	63-133	1	30
Batch number: H173211AA	Sample number(s): 9306675,9306681,9306687,9306693,9306699								
cis-1,2-Dichloroethene	5.00	5.13	5.00	5.14	103	103	80-120	0	30
Tetrachloroethene	5.00	4.80	5.00	4.80	96	96	80-120	0	30
Trichloroethene	5.00	4.96	5.00	4.88	99	98	80-120	2	30
Vinyl Chloride	5.00	4.48	5.00	4.54	90	91	63-133	1	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: 173130011A	Sample number(s): 9306640,9306652,9306658,9306664,9306676,9306682,9306688,9306694								
Acetylene	51.1	44.38	51.1	43.67	87	85	82-115	2	20
Ethane	58.4	60.02	58.4	58.63	103	100	85-115	2	20
Ethene	60.8	61.45	60.8	60.18	101	99	83-115	2	20
Methane	59.8	63.06	59.8	61.53	105	103	85-115	2	20
	mg/l	mg/l	mg/l	mg/l					
Batch number: 173130705004A	Sample number(s): 9306641,9306643,9306647,9306649-9306650,9306653-9306656,9306659								
Arsenic	0.0100	0.0104			104		85-115		
Copper	0.0500	0.0495			99		85-115		
Batch number: 173130705005A	Sample number(s): 9306660-9306662,9306665-9306668,9306671-9306673								
Arsenic	0.0100	0.0102			102		85-115		

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 07:04

Group Number: 1872858

LCS/LCSD (continued)

Analysis Name	LCS Spike Added mg/l	LCS Conc mg/l	LCSD Spike Added mg/l	LCSD Conc mg/l	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Copper	0.0500	0.0505			101		85-115		
Batch number: 173130705006A	Sample number(s): 9306674,9306677-9306680,9306683-9306686,9306689								
Arsenic	0.0100	0.0111			111		85-115		
Copper	0.0500	0.0494			99		85-115		
Batch number: 173130705007A	Sample number(s): 9306690-9306692,9306695-9306698								
Arsenic	0.0100	0.0105			105		85-115		
Copper	0.0500	0.0522			104		85-115		
Batch number: 173180705002A	Sample number(s): 9306642,9306644,9306648								
Arsenic	0.0100	0.0105			105		85-115		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17318667603B	Sample number(s): 9306639,9306645,9306651,9306657								
Total Organic Carbon	25	26.41			106		91-113		
Batch number: 17318667604A	Sample number(s): 9306663,9306669,9306675,9306681,9306687,9306693								
Total Organic Carbon	25	26.28			105		91-113		
	mg/l	mg/l	mg/l	mg/l					
Batch number: 17320249117A	Sample number(s): 9306640,9306646,9306652,9306658,9306664,9306670,9306676,9306682,9306688,9306694								
Sulfate	7.50	7.23			96		90-110		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Batch number: 173130705004A	Sample number(s): 9306641,9306643,9306647,9306649-9306650,9306653-9306656,9306659 UNSPK: 9306647, P306647									
Arsenic	0.0242	0.0100	0.0359			117		70-130		
Copper	0.00034 U	0.0500	0.0495			99		70-130		
Batch number: 173130705005A	Sample number(s): 9306660-9306662,9306665-9306668,9306671-9306673 UNSPK: 9306660, P306660									
Arsenic	0.0109	0.0100	0.0207			98		70-130		
Copper	0.00034 U	0.0500	0.0494			99		70-130		
Batch number: 173130705006A	Sample number(s): 9306674,9306677-9306680,9306683-9306686,9306689 UNSPK: 9306674, P306674									
Arsenic	0.0208	0.0100	0.0302			94		70-130		

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 07:04

Group Number: 1872858

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/l	MS Spike Added mg/l	MS Conc mg/l	MSD Spike Added mg/l	MSD Conc mg/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
Copper	0.00034 U	0.0500	0.0494			99		70-130		
Batch number: 173130705007A	Sample number(s): 9306690-9306692,9306695-9306698 UNSPK: 9306690, P306690									
Arsenic	0.0526	0.0100	0.0656			131 (2)		70-130		
Copper	0.000480	0.0500	0.0533			106		70-130		
Batch number: 173180705002A	Sample number(s): 9306642,9306644,9306648 UNSPK: 9306648									
Arsenic	0.0245	0.0100	0.0360			115		70-130		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17318667603B	Sample number(s): 9306639,9306645,9306651,9306657 UNSPK: P307996									
Total Organic Carbon	3.67	10	14.55			109		91-113		
Batch number: 17318667604A	Sample number(s): 9306663,9306669,9306675,9306681,9306687,9306693 UNSPK: P307997									
Total Organic Carbon	1.0 U	10	10.87			109		91-113		
	mg/l	mg/l	mg/l	mg/l	mg/l					
Batch number: 17320249117A	Sample number(s): 9306640,9306646,9306652,9306658,9306664,9306670,9306676,9306682,9306688,9306694 UNSPK: 9306646									
Sulfate	1.99	5.00	6.94			99		90-110		

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 173130705004A	Sample number(s): 9306641,9306643,9306647,9306649-9306650,9306653-9306656,9306659 BKG: 9306647, P306647			
Arsenic	0.0242	0.0244	1	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 173130705005A	Sample number(s): 9306660-9306662,9306665-9306668,9306671-9306673 BKG: 9306660, P306660			
Arsenic	0.0109	0.0111	2	20
Copper	0.00034 U	0.00034 U	0 (1)	20
Batch number: 173130705006A	Sample number(s): 9306674,9306677-9306680,9306683-9306686,9306689 BKG: 9306674, P306674			
Arsenic	0.0208	0.0208	0	20
Copper	0.00034 U	0.00034 U	0 (1)	20

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 07:04

Group Number: 1872858

Laboratory Duplicate (continued)

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/l	DUP Conc mg/l	DUP RPD	DUP RPD Max
Batch number: 173130705007A	Sample number(s): 9306690-9306692,9306695-9306698 BKG: 9306690, P306690			
Arsenic	0.0526	0.0547	4	20
Copper	0.000480	0.000490	2 (1)	20
Batch number: 173180705002A	Sample number(s): 9306642,9306644,9306648 BKG: 9306648			
Arsenic	0.0245	0.0229	7	20
Batch number: 17318667603B	Sample number(s): 9306639,9306645,9306651,9306657 BKG: P307996			
Total Organic Carbon	3.67	3.62	1 (1)	9
Batch number: 17318667604A	Sample number(s): 9306663,9306669,9306675,9306681,9306687,9306693 BKG: P307997			
Total Organic Carbon	1.0 U	1.0 U	0 (1)	9
Batch number: 17320249117A	Sample number(s): 9306640,9306646,9306652,9306658,9306664,9306670,9306676,9306682,9306688,9306694 BKG: 9306646			
Sulfate	1.99	1.99	0 (1)	15

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H173191AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9306639	98	98	103	96
9306645	101	102	100	96
9306651	102	102	101	97
9306657	102	103	99	97
9306663	102	102	100	97
9306669	101	101	100	96
Blank	99	97	100	96
LCS	101	103	101	100
LCSD	99	99	100	100
Limits:	80-120	80-120	80-120	80-120

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: The Boeing Company
Reported: 11/21/2017 07:04

Group Number: 1872858

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed unless attributed to dilution or otherwise noted on the Analysis Report. For dual column analyses, the surrogate (at least one surrogate for multi-surrogate tests) must be within the acceptance limits on at least one of the two columns.

Analysis Name: 8260C VC, TCE, PCE, cis1,2-DCE
Batch number: H173211AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
9306675	101	102	102	97
9306681	100	103	101	98
9306687	100	101	101	96
9306693	98	99	103	94
9306699	98	102	103	98
Blank	101	98	102	96
LCS	102	104	99	101
LCSD	101	105	100	101
Limits:	80-120	80-120	80-120	80-120

Analysis Name: AMEE by RSK-175
Batch number: 173130011A

	Propene
9306640	81
9306640DL	97
9306652	84
9306652DL	99
9306658	83
9306658DL	98
9306664	84
9306664DL	99
9306676	81
9306676DL	99
9306682	81
9306682DL	98
9306688	76
9306688DL	99
9306694	85
9306694DL	98
Blank	100
LCS	98
LCSD	101
Limits:	44-123

*- Outside of specification

(1) The result for one or both determinations was less than five times the LOQ.

(2) The unspiked result was more than four times the spike added.

P##### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Boeing Chain of Custody



Lancaster Laboratories

Acct. # 13419 Group # 182255 Sample # 150639-99
 For Eurofins Lancaster Laboratories use only
 Please print. Instructions on reverse side correspond.

1 Client Information

Site Location: Tukwila, WA
 Site Project: Boeing DC Regional Gov Project
 Site Program#: SWM-17-002527-099-039
 Boeing PMI: den Parsons
 Consultant Contact: Chris Kimmel
 Report To: C. Kimmel, J Parsons
 Invoice To: Boeing EHS Other (specify):
 Sampler: Jeovani Huesta # of Coolers: 2

2 Sample Identification

Sample Identification	Collected		Matrix	No. of Containers
	Date	Time		
BDC-DUP3-171107	11/7/17	1000	AQ	11
BDC-05-23-171107	11/7/17	1051	AQ	49
BDC-05-16-171107	11/7/17	1051	AQ	11
BDC-05-21-171107	11/7/17	1131	AQ	4
BDC-05-20-171107	11/7/17	1206	AQ	11
BDC-05-22-171107	11/7/17	1241	AQ	9
BDC-05-17-171107	11/7/17	1316	AQ	11
BDC-05-16-171107	11/7/17	1346	AQ	11
BDC-05-15-171107	11/7/17	1436	AQ	11
BDC-05-24-171107	11/7/17	1511	AQ	11
TOTP BLANKS	-	-	AQ	4

4 Analyses Requested

Analysis	Requested
REF, ICE, CIB, VC (8260)	X
HMEF (RISK 60P-175 MOD)	X
TOC (415.1)	X
Sulfate (300-0)	X
THM (HSCM & COPS (200-8))	X

5 Remarks/Comments

* Dissolved metals samples have been held by filter

NO ANEE ANALYSIS

2 per cooler

6 Turnaround Time Requested (please circle)

Standard 72 hour Date needed: _____
 5 day 4 day
 48 hour 24 hour

7

Relinquished by: AM Date/Time: 11/17/17
 Relinquished by: [Signature] Date/Time: 11/17/17
 Relinquished by: [Signature] Date/Time: 11/17/17
 Relinquished by commercial carrier (circle): JPS FedEx Other: _____
 Custody Seals Intact?: Yes No



Client: Boeing

Delivery and Receipt Information

Delivery Method:	<u>UPS</u>	Arrival Timestamp:	<u>11/08/2017 9:45</u>
Number of Packages:	<u>2</u>	Number of Projects:	<u>2</u>
State/Province of Origin:	<u>WA</u>		

Arrival Condition Summary

Shipping Container Sealed:	Yes	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	Yes	Sample Date/Times match COC:	Yes
Custody Seal Intact:	Yes	VOA Vial Headspace ≥ 6mm:	No
Samples Chilled:	Yes	Total Trip Blank Qty:	4
Paperwork Enclosed:	Yes	Trip Blank Type:	HCL
Samples Intact:	Yes	Air Quality Samples Present:	No
Missing Samples:	No		
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Nicole Reiff (25684) at 10:23 on 11/08/2017

Samples Chilled Details

Thermometer Types: DT = Digital (Temp. Bottle) IR = Infrared (Surface Temp) All Temperatures in °C.

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.6	DT	Wet	Y	Bagged	N
2	DT146	0.6	DT	Wet	Y	Bagged	N

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	mg	milligram(s)
C	degrees Celsius	mL	milliliter(s)
cfu	colony forming units	MPN	Most Probable Number
CP Units	cobalt-chloroplatinate units	N.D.	non-detect
F	degrees Fahrenheit	ng	nanogram(s)
g	gram(s)	NTU	nephelometric turbidity units
IU	International Units	pg/L	picogram/liter
kg	kilogram(s)	RL	Reporting Limit
L	liter(s)	TNTC	Too Numerous To Count
lb.	pound(s)	µg	microgram(s)
m3	cubic meter(s)	µL	microliter(s)
meq	milliequivalents	umhos/cm	micromhos/cm
<	less than		
>	greater than		
ppm	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
ppb	parts per billion		
Dry weight basis	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Data Qualifiers

Qualifier	Definition
C	Result confirmed by reanalysis
D1	Indicates for dual column analyses that the result is reported from column 1
D2	Indicates for dual column analyses that the result is reported from column 2
E	Concentration exceeds the calibration range
J (or G, I, X)	Estimated value \geq the Method Detection Limit (MDL or DL) and $<$ the Limit of Quantitation (LOQ or RL)
P	Concentration difference between the primary and confirmation column $>40\%$. The lower result is reported.
U	Analyte was not detected at the value indicated
V	Concentration difference between the primary and confirmation column $>100\%$. The reporting limit is raised due to this disparity and evident interference.
W	The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.
Z	Laboratory Defined - see analysis report

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.

Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Cumulative Groundwater Elevations

DEVELOPMENTAL CENTER
CUMULATIVE WATER LEVEL MEASUREMENTS

Well Location / Bldg.	Well ID No.	Well Depth (ft)	November 2017		August 2017		May 2017		February 2017		November 2016		August 2016		April 2016		January 2016		October 2015		July 2015		April 2015		January 2015		November 2014	
			Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
9-101-bldg.	MW-6A	24.25	12.81	1.99			11.97	2.83			12.13	2.67			12.38	2.42			12.80	2.00			12.65	2.15			12.22	2.58
9-101-bldg.	MW-6B	27.20	13.15	1.94			12.31	2.78			12.82	2.27			12.77	2.32			13.16	1.93			13.02	2.07			12.58	2.51
9-101-bldg.	MW-6C	40.55																										
9-101-bldg.	MW-8C	40.20																										
9-101-bldg.	MW-9A	21.30	12.91	1.83			12.07	2.67			12.18	2.56			12.37	2.37			12.83	1.91			12.64	2.10			12.18	2.56
9-101-bldg.	MW-9B	26.90																										
9-101-bldg.	MW-9C	38.80																										
9-101-bldg.	MW-9D	56.00																										
9-101-bldg.	MW-10A	20.20																										
9-101-bldg.	MW-10C	40.40	12.86	1.78			11.97	2.67			12.16	2.48			12.37	2.27			12.66	1.96			12.57	2.05			12.14	2.55
9-101-bldg.	MW-11A	19.90	12.96	1.92			12.03	2.85			12.14	2.74			12.47	2.41			12.87	2.01			12.74	2.14			12.06	2.56
9-101-bldg.	MW-12A	20.20																										
9-101-bldg.	MW-13A	19.37	12.28	1.86			11.57	2.57			11.55	2.59			11.82	2.32			12.23	1.91			12.19	1.95			11.71	2.43
9-101-bldg.	MW-13C	35.62	12.10	1.92			11.39	2.63			11.41	2.61			11.71	2.31			12.08	1.94			12.07	1.95			11.59	2.43
9-101-bldg.	MW-14A	19.00																										
9-101-bldg.	MW-14C	33.30	12.10	1.87			11.40	2.57			11.33	2.64			11.78	2.19			11.95	2.02			11.95	2.02			11.54	2.43
9-101-bldg.	MW-14E	82.10																										
9-101-bldg.	MW-15A	20.70																										
9-101-bldg.	MW-15C	34.35	12.79	1.76			12.00	2.55			11.98	2.57			12.45	2.10			12.19	1.98			12.29	1.88			11.77	2.40
9-101-bldg.	MW-15D	51.80																										
9-101-bldg.	MW-16A	20.55	12.99	2.00			12.18	2.81			12.32	2.67			12.60	2.39			12.96	2.03			12.85	2.14			12.40	2.59
9-101-bldg.	MW-16C	38.30	13.14	1.90			12.33	2.71			12.54	2.50			12.70	2.34			13.14	1.90			13.02	2.02			12.58	2.46
9-101-bldg.	MW-17A	19.00	12.81	1.85			11.97	2.69			12.11	2.55			12.28	2.38			12.83	1.97			12.67	2.13			12.25	2.55
9-101-bldg.	MW-17C	35.00																										
9-101-bldg.	MW-17D	52.50																										
9-101-bldg.	MW-18A	20.02	12.50	1.80			11.73	2.57			11.68	2.62			11.87	2.43			12.36	1.94			12.26	2.04			11.86	2.44
9-101-bldg.	MW-18C	34.55																										
9-101-bldg.	MW-18D	52.85																										
9-101-bldg.	MW-19A	16.86																										
9-101-bldg.	MW-19C	33.92																										
9-101-bldg.	MW-19D	51.86																										
9-101-bldg.	MW-20A	19.34																										
9-101-bldg.	MW-20C	35.32	12.45	1.70			11.59	2.56			11.55	2.60			11.95	2.20			12.14	2.01			12.19	1.96			11.61	2.54
9-101-bldg.	MW-20D	50.15																										
9-101-bldg.	MW-22A	19.20	12.55	1.70			11.79	2.46			11.79	2.46			12.12	2.13			12.34	1.91			12.33	1.92			11.96	2.29
9-101-bldg.	MW-23A	19.50																										
9-101/9-50 bldg.	MW-21A	19.90	12.68	1.77			11.97	2.48			11.85	2.60			12.10	2.35			12.55	1.90			12.48	1.97			12.06	2.39
9-101/9-50 bldg.	MW-21C	34.00																										
9-64-bldg.	BDC-05-02	25.35	12.42	1.99	12.31	2.10	11.46	2.95	11.24	3.17	11.68	2.73	12.53	1.88	11.77	2.64	10.85	3.56	12.28	2.13	12.30	2.11	12.07	2.34	11.49	2.92	11.77	2.64
9-64-bldg.	BDC-05-03	25.47	12.45	1.96			11.58	2.83			11.71	2.70			11.86	2.55			12.33	2.08			12.19	2.22			11.79	2.62
9-64-bldg.	BDC-05-04	25.36	12.58	2.01			11.62	2.97			11.86	2.73			11.95	2.64			12.54	2.05			12.26	2.33			11.95	2.64
9-64-bldg.	BDC-05-05	24.18	12.27	2.17			11.19	3.25			11.52	2.92			11.57	2.87			12.18	2.26			11.86	2.58			11.53	2.91
9-64-bldg.	BDC-05-07	25.30	12.03	1.96			11.02	2.97			11.22	2.77			11.38	2.61			11.88	2.11			11.67	2.32			11.37	2.62
9-64-bldg.	BDC-05-08	26.75	12.71	1.96			11.88	2.79			11.95	2.72			12.11	2.56			12.62	2.05			12.47	2.20			12.10	2.57
9-64-bldg.	BDC-05-09	24.55	12.41	2.00			11.49	2.92			11.68	2.73			11.80	2.61			12.30	2.11			12.10	2.31			11.79	2.62
9-64-bldg.	BDC-05-10	24.57	12.44	1.97			11.31	3.10			11.62	2.79			11.80	2.61			12.27	2.14			12.11	2.30			11.72	2.69
9-64-bldg.	BDC-05-11	24.85	12.58	2.07			11.71	2.94			11.78	2.87			12.02	2.63			12.99	1.66			12.33	2.32			11.93	2.72
9-64-bldg.	BDC-05-12	24.87	12.68	2.04	12.62	2.10	11.80	2.92	11.50	3.22	11.91	2.81	12.80	1.92	12.11	2.61	11.21	3.51	12.59	2.13	12.63	2.09	12.43	2.29	11.83	2.89	12.06	2.66
9-64-bldg.	BDC-05-13	24.78	12.44	1.99			11.62	2.81			11.68	2.75			11.87	2.56			12.37	2.06			12.20	2.23			11.85	2.58
9-64-bldg.	BDC-05-14	24.85	12.25	1.97			11.39	2.83			11.52	2.70			11.71	2.51			12.18	2.04			12.03	2.19			11.70	2.52
9-64-bldg.	BDC-05-15	24.48	11.94	2.03			11.20	2.77			11.28	2.69			11.49	2.48			11.95	2.02			11.83	2.14			11.47	2.50
9-64-bldg.	BDC-05-16	24.89	12.10	1.97	12.13	1.94	11.32	2.75	11.05	3.02	11.43	2.64	12.31	1.76	11.65	2.42	10.79	3.28	12.10	1.97	12.10	1.97	11.90	2.17	11.31	2.76	11.65	2.42
9-64-bldg.	BDC-05-17	24.82	12.33	1.92			11.56	2.69			11.65	2.60			11.86	2.39			12.29	1.96			12.12	2.13			11.86	2.39
9-64-bldg.	BDC-05-18	24.69	11.73	2.06	11.77	2.02	10.92	2.87	10.70	3.09	11.13	2.66	11.96	1.83	11.22	2.57	10.34	3.45	11.77	2.02	11.75	2.04	11.50	2.29	10.98	2.81	11.14	2.65
9-64-bldg.	BDC-05-19	24.85	12.58	1.98	12.52	2.04	11.73	2.83	11.43	3.13	11.82	2.74	12.68	1.88	11.99	2.57	11.11	3.45	12.49	2.07	12.53	2.03	12.33	2.23	11.61	2.95	11.96	2.60
9-64-bldg.	BDC-05-20	24.80	12.41	1.93	12.44	1.90	11.66	2.68	11.34	3.00	11.74	2.60	12.62	1.72	11.92	2.42	11.08	3.26	12.37	1.97	12.42	1.92	12.25	2.09	11.64	2.70	11.92	2.42
9-64-bldg.	BDC-05-21	24.86	12.31	1.88	12.29	1.90	11.49	2.70	11.16	3.03	11.57	2.62	12.50	1.69	11.80	2.39	10.96	3.23	12.22	1.97	12.24	1.95	12.10	2.09	11.51	2.68	11.80	2.39
9-64-bldg.	BDC-05-22	25.07	12.21	1.95	12.22	1.94	11.45	2.71	11.16	3.00	11.59	2.57	12.42	1.74	11.73	2.43	10.89	3.27	12.19	1.97	12.29	1.87	12.04	2.12	11.47	2.69	11.74	2.42
9-64-bldg.	BDC-05-23	25.10	12.69	1.77	12.74	1.72	11.94	2.52	11.48	2.98	12.02	2																

DEVELOPMENTAL CENTER
CUMULATIVE WATER LEVEL MEASUREMENTS

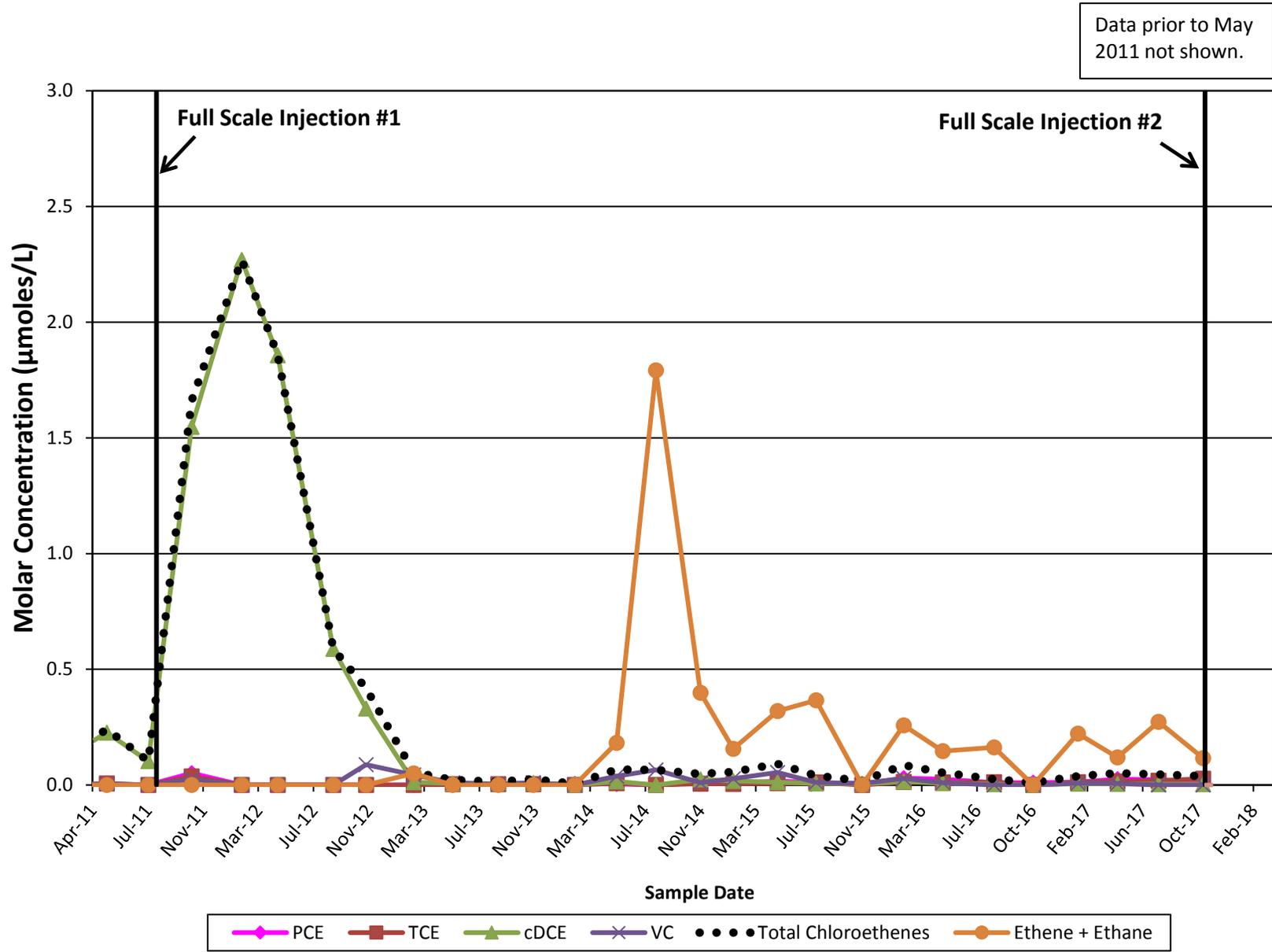
Well Location / Bldg.	Well ID No.	Well Depth (ft)	August 2014		May 2014		February 2014		November 2013		August 2013		May 2013		February 2013		November 2012		May 2012		November 2011		July 2011		May 2011		November 2010	
			Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
9-101-bldg.	MW-6A	24.25			12.10	2.70			12.82	1.98			12.92	1.88			12.82	1.98	12.61	2.19	12.99	1.81			12.50	2.30	12.70	2.10
9-101-bldg.	MW-6B	27.20			14.44	0.65			13.16	1.93			13.27	1.82			13.17	1.92	12.96	2.13	13.29	1.80			12.81	2.28	13.06	2.03
9-101-bldg.	MW-6C	40.55																										
9-101-bldg.	MW-8C	40.20																										
9-101-bldg.	MW-9A	21.30			12.07	2.67			12.88	1.86			12.80	1.94			12.83	1.91	12.54	2.20	13.03	1.71			12.53	2.21	12.65	2.09
9-101-bldg.	MW-9B	26.90																										
9-101-bldg.	MW-9C	38.80																										
9-101-bldg.	MW-9D	56.00																										
9-101-bldg.	MW-10A	20.20			11.98	2.71			12.81	1.88			12.72	1.97			12.77	1.92	12.55	2.14	12.97	1.72			12.47	2.22	12.64	2.05
9-101-bldg.	MW-10C	40.40			11.91	2.71			12.73	1.89			12.65	1.97			12.70	1.92	12.49	2.13	12.90	1.72			12.38	2.24	12.55	2.07
9-101-bldg.	MW-11A	19.90			12.10	2.78			12.89	1.99			12.84	2.04			12.19	2.69	12.65	2.23	13.03	1.85			12.62	2.26	12.59	2.29
9-101-bldg.	MW-12A	20.20			12.17	2.66			12.98	1.85			12.88	1.95			13.01	1.82	12.70	2.13	13.23	1.60			12.71	2.12	12.68	2.15
9-101-bldg.	MW-13A	19.37			11.62	2.52			12.37	1.77			12.36	1.78			12.27	1.87	12.20	1.94	12.66	1.48			12.11	2.03	12.08	2.06
9-101-bldg.	MW-13C	35.62			11.49	2.53			12.23	1.79			12.22	1.80			12.11	1.91	12.06	1.96	12.52	1.50			11.94	2.08	11.92	2.10
9-101-bldg.	MW-14A	19.00			11.85	2.52			12.59	1.78			12.65	1.72			12.53	1.84	12.46	1.91	12.71	1.66			12.16	2.21	12.22	2.15
9-101-bldg.	MW-14C	33.30			11.49	2.48			12.17	1.80			12.25	1.72			12.07	1.90	12.09	1.88	12.20	1.77			12.78	1.19	11.82	2.15
9-101-bldg.	MW-14E	82.10																										
9-101-bldg.	MW-15A	20.70			11.72	2.45			12.44	1.73			12.48	1.69			12.34	1.83	12.16	2.01	12.51	1.66			11.87	2.30	12.12	2.05
9-101-bldg.	MW-15C	34.35			11.71	2.46			12.42	1.75			12.54	1.63			12.27	1.90	12.36	1.81	12.44	1.73			11.49	2.68	12.00	2.17
9-101-bldg.	MW-15D	51.80																										
9-101-bldg.	MW-16A	20.55			12.22	2.77			13.06	1.93			13.07	1.92			13.02	1.97	12.81	2.18	13.19	1.80			12.67	2.32	12.84	2.15
9-101-bldg.	MW-16C	38.30			12.32	2.72			13.24	1.80			13.25	1.79			13.17	1.87	13.01	2.03	13.33	1.71			12.84	2.20	13.02	2.02
9-101-bldg.	MW-17A	19.00			12.11	2.69			12.90	1.90			12.98	1.82			12.78	2.02	12.26	2.54	12.73	2.07	12.84	1.96	12.45	2.35	12.65	2.15
9-101-bldg.	MW-17C	35.00																										
9-101-bldg.	MW-17D	52.50																										
9-101-bldg.	MW-18A	20.02			11.70	2.60			12.23	2.07			12.58	1.72			12.39	1.91	11.90	2.40	12.84	1.46	12.43	1.87	12.14	2.16	12.22	2.08
9-101-bldg.	MW-18C	34.55																										
9-101-bldg.	MW-18D	52.85																										
9-101-bldg.	MW-19A	16.86											10.74	1.49														
9-101-bldg.	MW-19C	33.92																										
9-101-bldg.	MW-19D	51.86																										
9-101-bldg.	MW-20A	19.34																										
9-101-bldg.	MW-20C	35.32			11.58	2.57			12.40	1.75			12.50	1.65			12.22	1.93	12.18	1.97	12.76	1.39			12.27	1.88	11.87	2.28
9-101-bldg.	MW-20D	50.15																										
9-101-bldg.	MW-22A	19.20			11.90	2.35			12.42	1.83			12.72	1.53			12.42	1.83	12.35	1.90	12.52	1.73			12.14	2.11	12.40	1.85
9-101-bldg.	MW-23A	19.50																										
9-101/9-50 bldg.	MW-21A	19.90			11.90	2.55			12.39	2.06			12.80	1.65			12.60	1.85	12.13	2.32	13.05	1.40	12.67	1.78	12.41	2.04	12.43	2.02
9-101/9-50 bldg.	MW-21C	34.00																										
9-64-bldg.	BDC-05-02	25.35	12.26	2.15	11.69	2.72	12.21	2.20	12.36	2.05	12.47	1.94	12.29	2.12	12.19	2.22	12.31	2.10	11.81	2.60	12.63	1.78	12.35	2.06	11.81	2.60	12.10	2.31
9-64-bldg.	BDC-05-03	25.47			11.76	2.65			12.43	1.98			12.36	2.05			12.36	2.05	11.95	2.46	12.77	1.64			11.94	2.47	12.21	2.20
9-64-bldg.	BDC-05-04	25.36			11.93	2.66			12.51	2.08			12.17	2.42			12.52	2.07	12.05	2.54	12.82	1.77			12.03	2.56	12.30	2.29
9-64-bldg.	BDC-05-05	24.18			11.47	2.97			12.15	2.29			12.13	2.31			13.40	1.04	11.65	2.79	12.50	1.94			11.61	2.83	11.95	2.49
9-64-bldg.	BDC-05-07	25.30			11.29	2.70			11.96	2.03			11.92	2.07			11.97	2.02	11.40	2.59	12.23	1.76			11.42	2.57	11.95	2.04
9-64-bldg.	BDC-05-08	26.75			12.07	2.60			12.72	1.95			12.64	2.03			12.64	2.03	12.28	2.39	13.02	1.65			12.20	2.47	12.49	2.18
9-64-bldg.	BDC-05-09	24.55			11.71	2.70			12.37	2.04			12.31	2.10			12.36	2.05	11.90	2.51	12.68	1.73	12.27	2.13	12.27	2.14		
9-64-bldg.	BDC-05-10	24.57			11.70	2.71			12.36	2.05			12.31	2.10			12.30	2.11	11.95	2.46	12.74	1.67			12.27	2.14		
9-64-bldg.	BDC-05-11	24.85			11.91	2.74			12.59	2.06			12.51	2.14			12.55	2.10	12.13	2.52	12.92	1.73	12.60	2.05	12.60	2.05		
9-64-bldg.	BDC-05-12	24.87	12.58	2.14	12.01	2.71	12.53	2.19	12.88	1.84	12.78	1.94	12.61	2.11	12.53	2.19	12.66	2.06	12.24	2.48	13.00	1.72	12.57	2.15	12.57	2.15		
9-64-bldg.	BDC-05-13	24.78			11.86	2.57			12.44	1.99			12.40	2.03			12.44	1.99	12.02	2.41	12.78	1.65	12.35	2.08	12.23	1.99		
9-64-bldg.	BDC-05-14	24.85			11.68	2.54			12.25	1.97			12.21	2.01			12.29	1.93	11.83	2.39	12.55	1.67	12.23	1.99	12.23	1.99		
9-64-bldg.	BDC-05-15	24.48			11.42	2.55			12.04	1.93			12.07	1.90			11.97	2.00	11.63	2.34	12.34	1.63	11.95	2.02	11.95	2.02		
9-64-bldg.	BDC-05-16	24.89	12.04	2.03	11.60	2.47	12.00	2.07	12.16	1.91	12.25	1.82	12.19	1.88	12.04	2.03	12.09	1.98	11.78	2.29	12.44	1.63	12.05	2.02	12.05	2.02		
9-64-bldg.	BDC-05-17	24.82			11.83	2.42			12.34	1.91			12.30	1.95			12.27	1.98	11.65	2.60	12.60	1.65	12.27	1.98	12.27	1.98		
9-64-bldg.	BDC-05-18	24.69	11.51	2.28	11.16	2.63	11.62	2.17	11.71	2.08	11.90	1.89	11.72	2.07	11.63	2.16	11.75	2.04	11.34	2.45	12.10	1.69	11.84	1.95	11.84	1.95		
9-64-bldg.	BDC-05-19	24.85	12.47	2.09	11.91	2.65	12.43	2.13	12.58	1.98	12.68	1.88	12.52	2.04	12.44	2.12	12.60	1.96	12.15	2.41	12.90	1.66	12.59	1.97	12.59	1.97		
9-64-bldg.	BDC-05-20	24.80	12.45	1.89	11.95	2.39	12.28	2.06	12.46	1.88	12.55	1.79	12.38	1.96	12.41	1.93	12.44	1.90	12.08	2.26	12.75	1.59	12.47	1.87	12.47	1.87		
9-64-bldg.	BDC-05-21	24.86	12.29	1.90	11																							

DEVELOPMENTAL CENTER
CUMULATIVE WATER LEVEL MEASUREMENTS

Well Location / Bldg.	Well ID No.	Well Depth (ft)	June 2000		November 1999	
			Depth to Water (ft)	Water Elevation (ft)	Depth to Water (ft)	Water Elevation (ft)
9-101-bldg.	MW-6A	24.25				
9-101-bldg.	MW-6B	27.20	13.01	1.82	13.33	1.50
9-101-bldg.	MW-6C	40.55	13.15	1.84	13.50	1.49
9-101-bldg.	MW-8C	40.20	13.13	1.79	13.79	1.13
9-101-bldg.	MW-9A	21.30	12.78	1.86	13.67	0.97
9-101-bldg.	MW-9B	26.90	12.81	1.91	13.90	0.82
9-101-bldg.	MW-9C	38.80	12.75	1.93	13.60	1.08
9-101-bldg.	MW-9D	56.00	12.74	1.92	13.00	1.66
9-101-bldg.	MW-10A	20.20	12.84	1.85	13.50	1.19
9-101-bldg.	MW-10C	40.40	12.74	1.88	13.29	1.33
9-101-bldg.	MW-11A	19.90	12.91	1.97	13.20	1.68
9-101-bldg.	MW-12A	20.20	13.02	1.81	13.21	1.62
9-101-bldg.	MW-13A	19.37	12.50	1.64	12.33	1.81
9-101-bldg.	MW-13C	35.62	12.37	1.65	12.21	1.81
9-101-bldg.	MW-14A	19.00	12.70	1.77	12.78	1.69
9-101-bldg.	MW-14C	33.30	12.17	1.80	12.35	1.62
9-101-bldg.	MW-14E	82.10	7.45	6.73	7.90	6.28
9-101-bldg.	MW-15A	20.70	12.40	1.77	12.35	1.82
9-101-bldg.	MW-15C	34.35	12.36	1.81	12.49	1.68
9-101-bldg.	MW-15D	51.80	12.59	1.82	12.44	1.97
9-101-bldg.	MW-16A	20.55	13.19	1.80	13.34	1.65
9-101-bldg.	MW-16C	38.30	13.36	1.68	13.52	1.52
9-101-bldg.	MW-17A	19.00	13.05	1.75	13.03	1.77
9-101-bldg.	MW-17C	35.00	13.10	1.75	13.05	1.80
9-101-bldg.	MW-17D	52.50	13.25	1.62	12.82	2.05
9-101-bldg.	MW-18A	20.02	12.55	1.75	12.38	1.92
9-101-bldg.	MW-18C	34.55	12.83	1.80	12.61	2.02
9-101-bldg.	MW-18D	52.85	12.52	1.74	12.33	1.93
9-101-bldg.	MW-19A	16.86	10.68	1.55	10.42	1.81
9-101-bldg.	MW-19C	33.92	10.65	1.58	10.35	1.88
9-101-bldg.	MW-19D	51.86	10.71	1.52	11.05	1.18
9-101-bldg.	MW-20A	19.34	12.44	1.87	12.75	1.56
9-101-bldg.	MW-20C	35.32	12.16	1.99	12.44	1.71
9-101-bldg.	MW-20D	50.15	12.41	2.02	12.66	1.77
9-101-bldg.	MW-22A	19.20				
9-101-bldg.	MW-23A	19.50				
9-101/9-50 bldg.	MW-21A	19.90	12.93	1.52	12.50	1.95
9-101/9-50 bldg.	MW-21C	34.00				
9-64-bldg.	BDC-05-02	25.35	12.37	2.00	12.03	2.34
9-64-bldg.	BDC-05-03	25.47	12.56	1.85	12.33	2.08
9-64-bldg.	BDC-05-04	25.36	12.65	1.94	12.33	2.26
9-64-bldg.	BDC-05-05	24.18	12.36	2.08	11.96	2.48
9-64-bldg.	BDC-05-07	25.30	12.08	1.91	11.72	2.27
9-64-bldg.	BDC-05-08	26.75				
9-64-bldg.	BDC-05-09	24.55				
9-64-bldg.	BDC-05-10	24.57				
9-64-bldg.	BDC-05-11	24.85				
9-64-bldg.	BDC-05-12	24.87				
9-64-bldg.	BDC-05-13	24.78				
9-64-bldg.	BDC-05-14	24.85				
9-64-bldg.	BDC-05-15	24.48				
9-64-bldg.	BDC-05-16	24.89				
9-64-bldg.	BDC-05-17	24.82				
9-64-bldg.	BDC-05-18	24.69				
9-64-bldg.	BDC-05-19	24.85				
9-64-bldg.	BDC-05-20	24.80				
9-64-bldg.	BDC-05-21	24.86				
9-64-bldg.	BDC-05-22	25.07				
9-64-bldg.	BDC-05-23	25.10				
9-64-bldg.	BDC-05-24	24.73				
9-60 bldg.	BDC-101	18.42				
9-60 bldg.	BDC-102	18.83				
9-60 bldg.	BDC-103	18.51				
9-60 bldg.	BDC-104	18.90				
9-52-bldg.	952MW-1	17.40			10.97	2.51
9-52-bldg.	952MW-2	17.54			11.25	2.75
9-52-bldg.	952MW-3	17.95			11.28	2.48
9-52-bldg. (west)	MW-5	27.43			10.53	2.42
9-04-bldg. (north)	MW-2	26.98	10.19	2.48	9.53	3.14
9-04-bldg. (north)	MW-7	18.50				
9-04-bldg. (north)	MW-8	18.50				
9-04-bldg. (north)	MW-9	18.50				

Notes:
ft = feet
Depth to Water measurements taken from top of well casing.
Top of casing elevation altered in wells MW-6B, MW-6C, MW-9A, MW-9B, and MW-9C by installation of threaded fitting on 6/19/2004.
Top of casing elevation was lowered in well MW-14A by 0.10 ft on 3/17/2005; resurveyed 9/9/05.
Top of casing elevation at wells MS-22A and MW-23A measured 9/9/05.
BDC-05-02 was modified in October 2008 for utilization as an injection well. Elevation changed from 14.37 to 14.41 ft; total depth changed from 25.35 to 25.27.

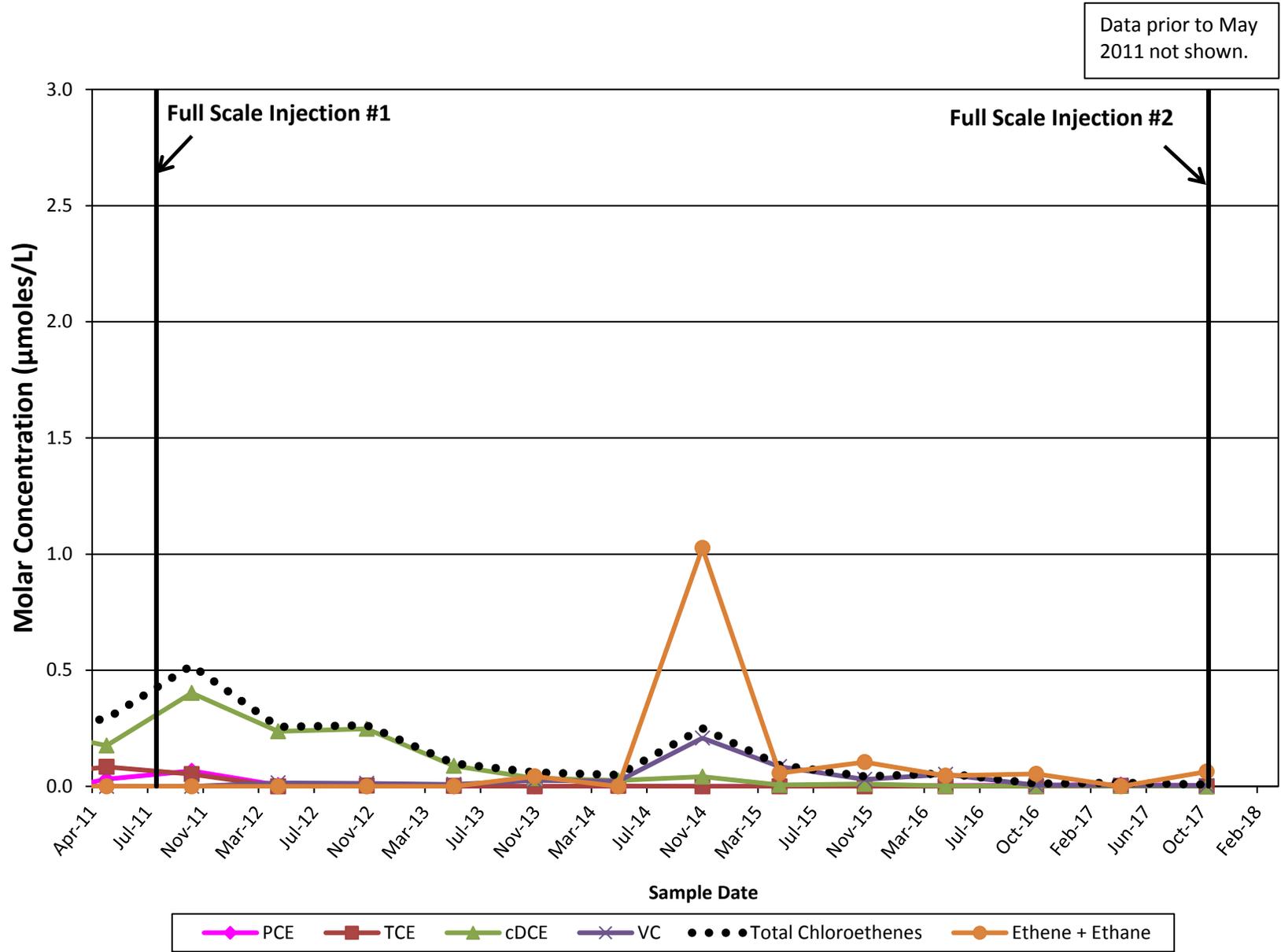
Time Plots – Molar Concentrations of VOCs and Breakdown Products



Boeing Developmental Center
Tukwila, Washington

Molar Equivalents
Source Zone Injection Well BDC-05-02
VOCs

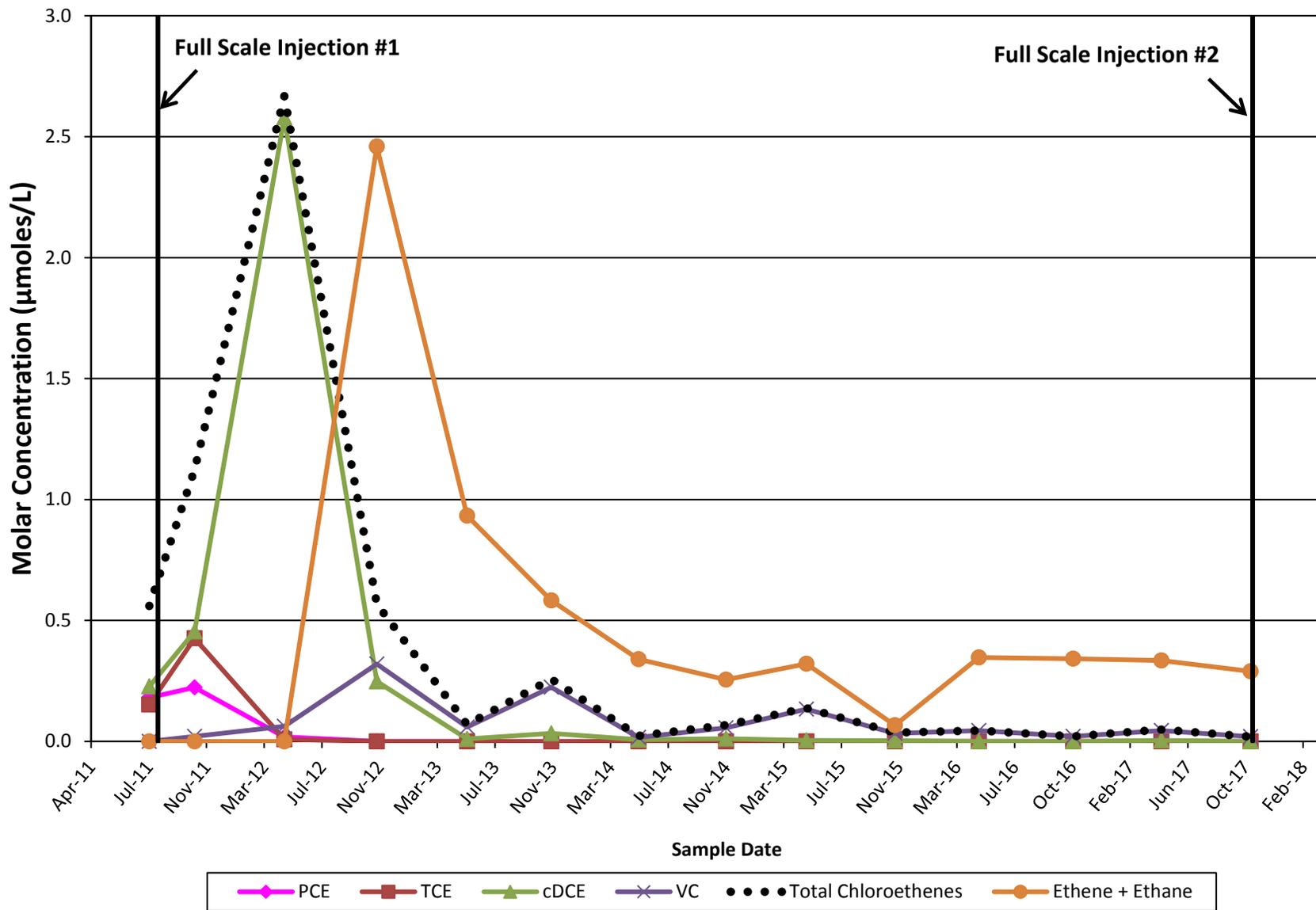
Figure
C-1



Boeing Developmental Center
Tukwila, Washington

Molar Equivalents
Source Zone Injection Well BDC-05-07
VOCs

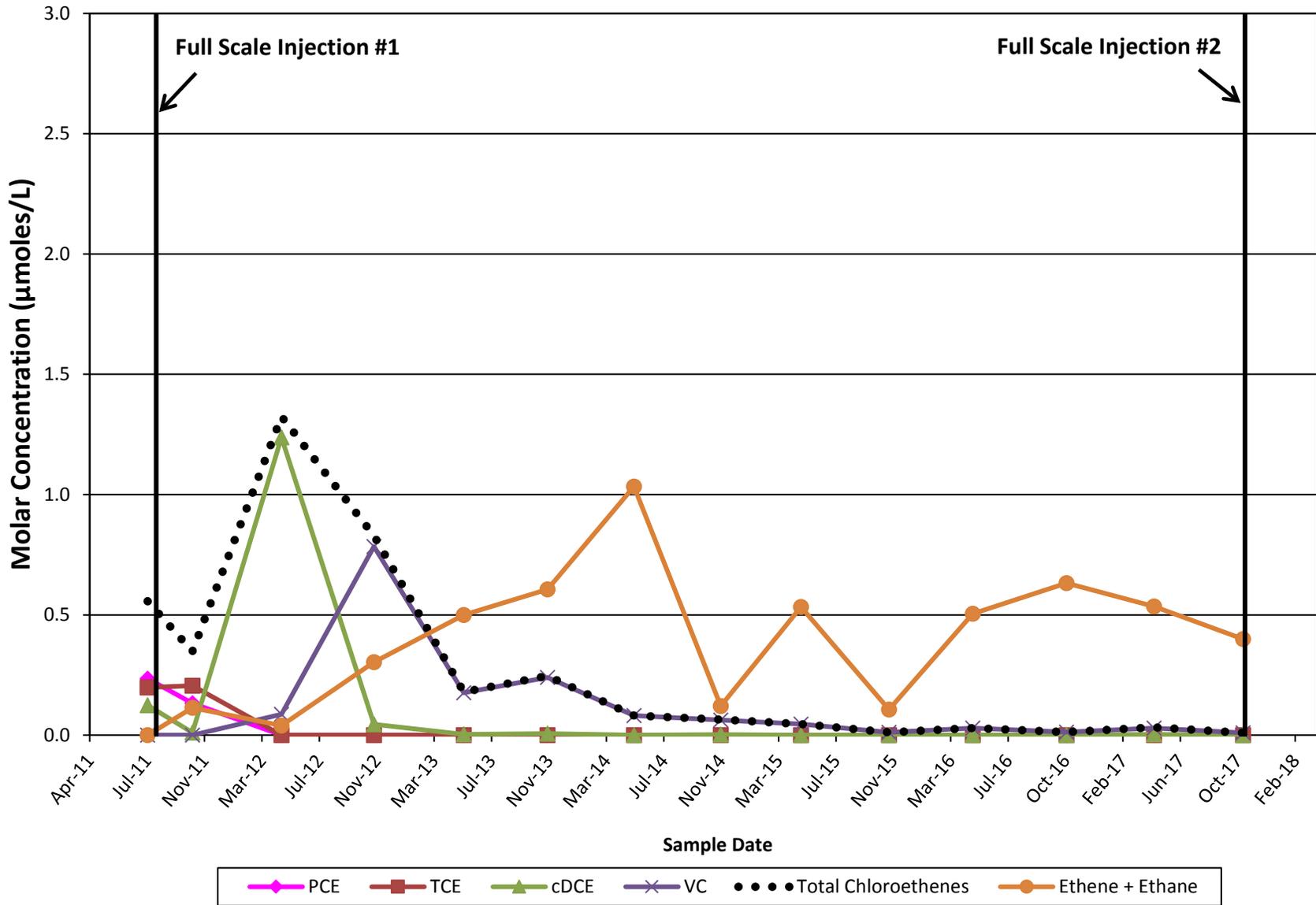
Figure
C-2



Boeing Developmental Center
Tukwila, Washington

**Molar Equivalents
Plume Injection Well BDC-05-09 VOCs**

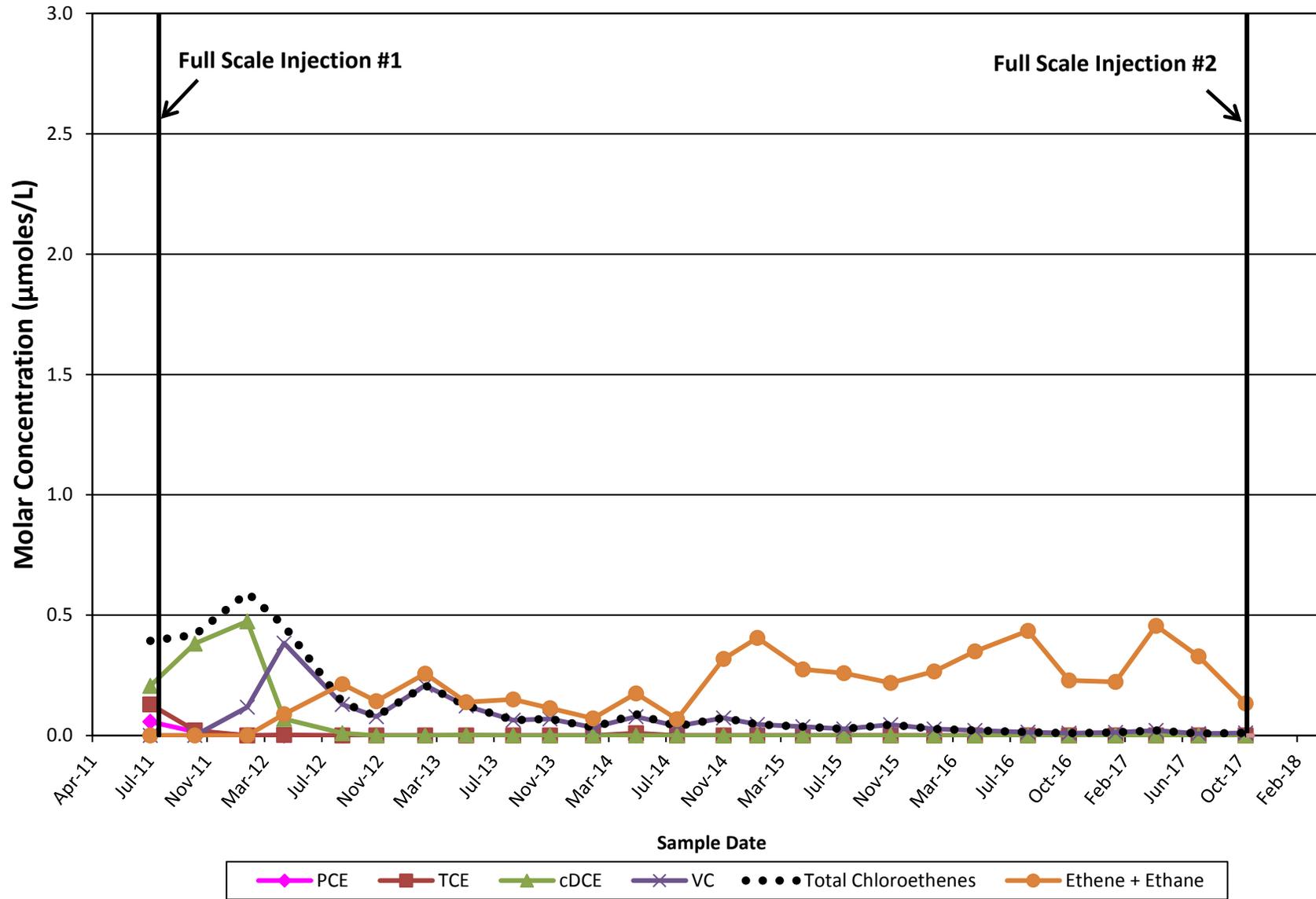
Figure
C-3



Boeing Developmental Center
Tukwila, Washington

**Molar Equivalents
Plume Injection Well BDC-05-10 VOCs**

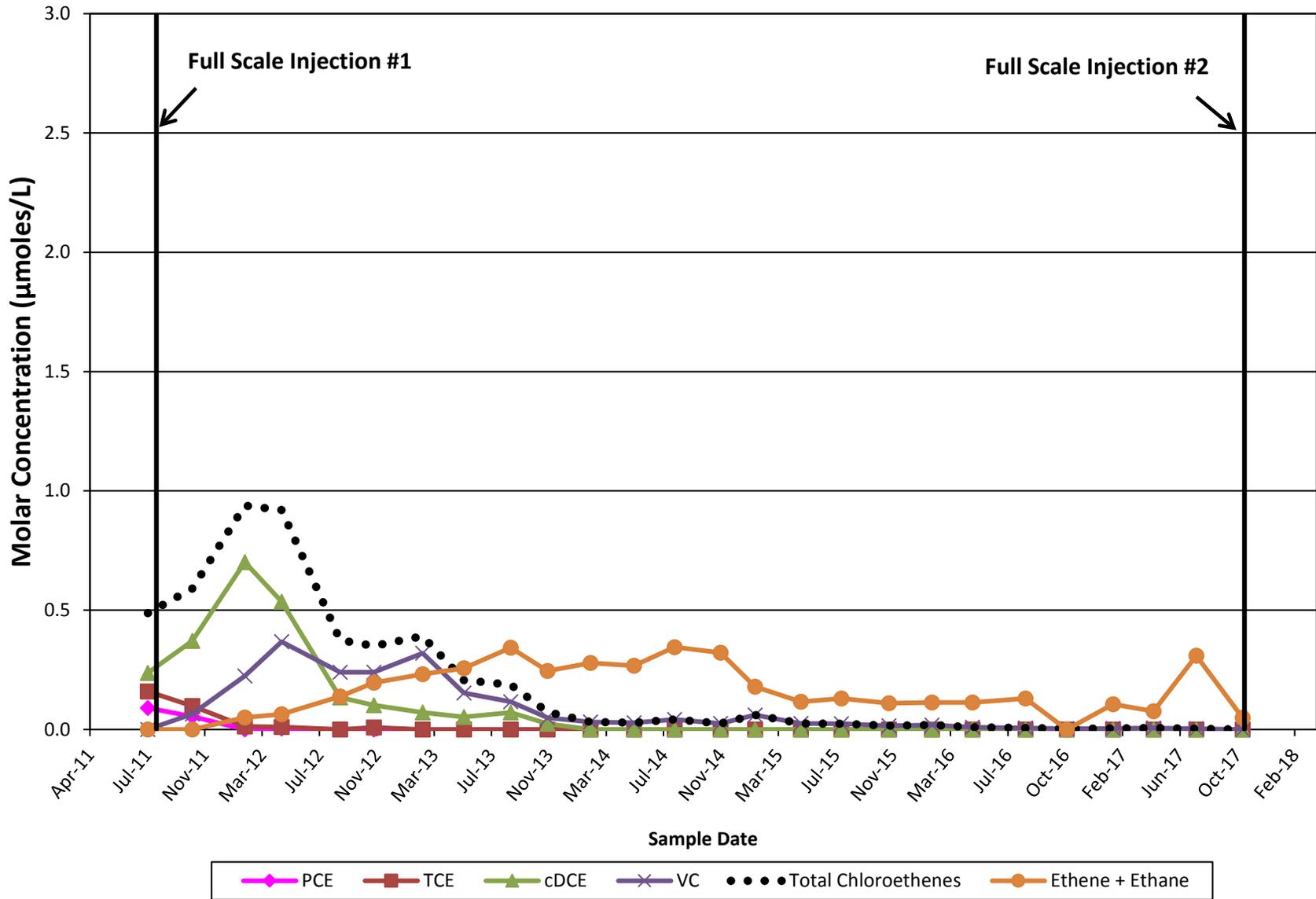
Figure
C-4



Boeing Developmental Center
Tukwila, Washington

**Molar Equivalents
Plume Injection Well BDC-05-16 VOCs**

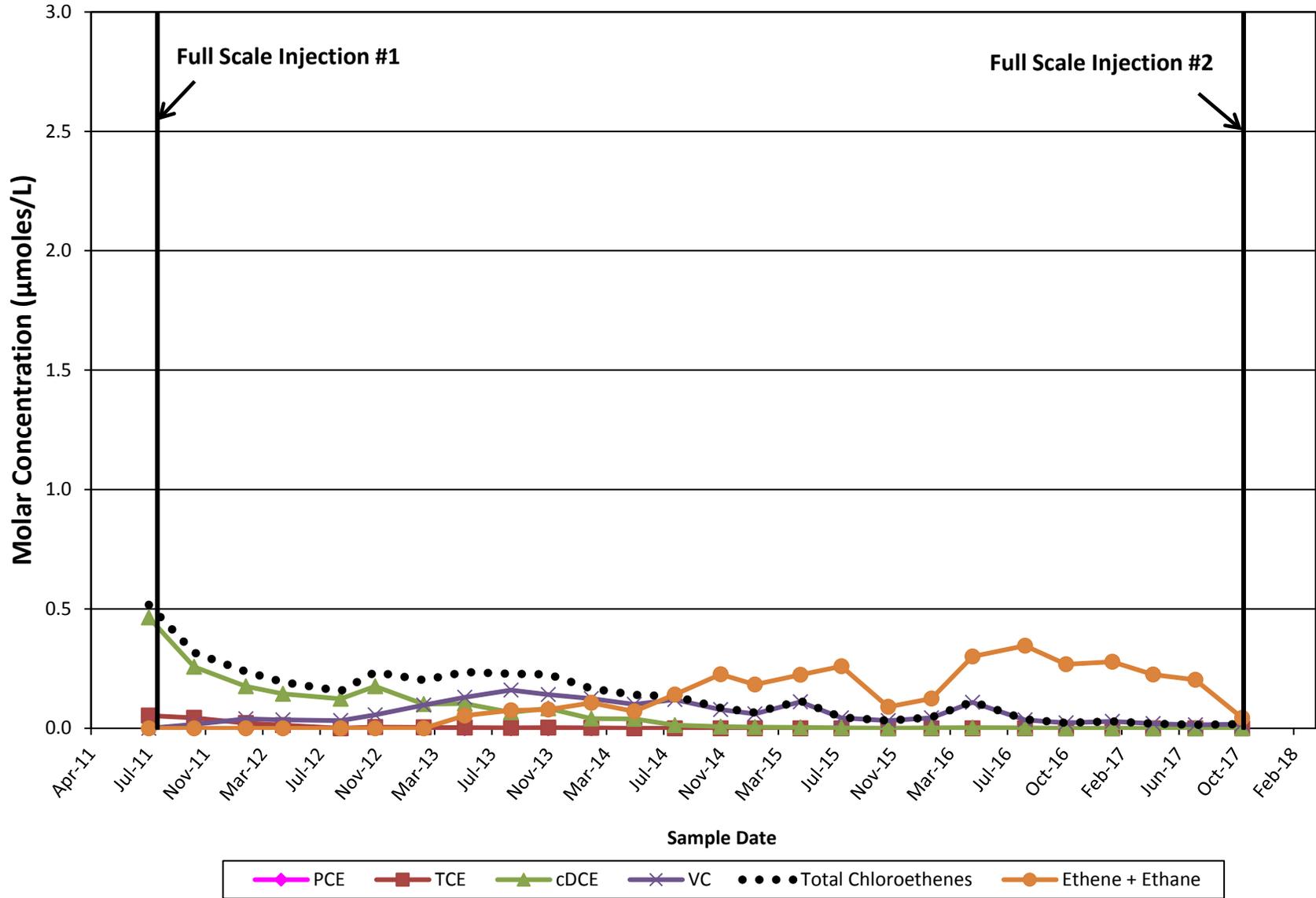
Figure
C-5



Boeing Developmental Center
Tukwila, Washington

**Molar Equivalents
Monitoring Well BDC-05-19 VOCs**

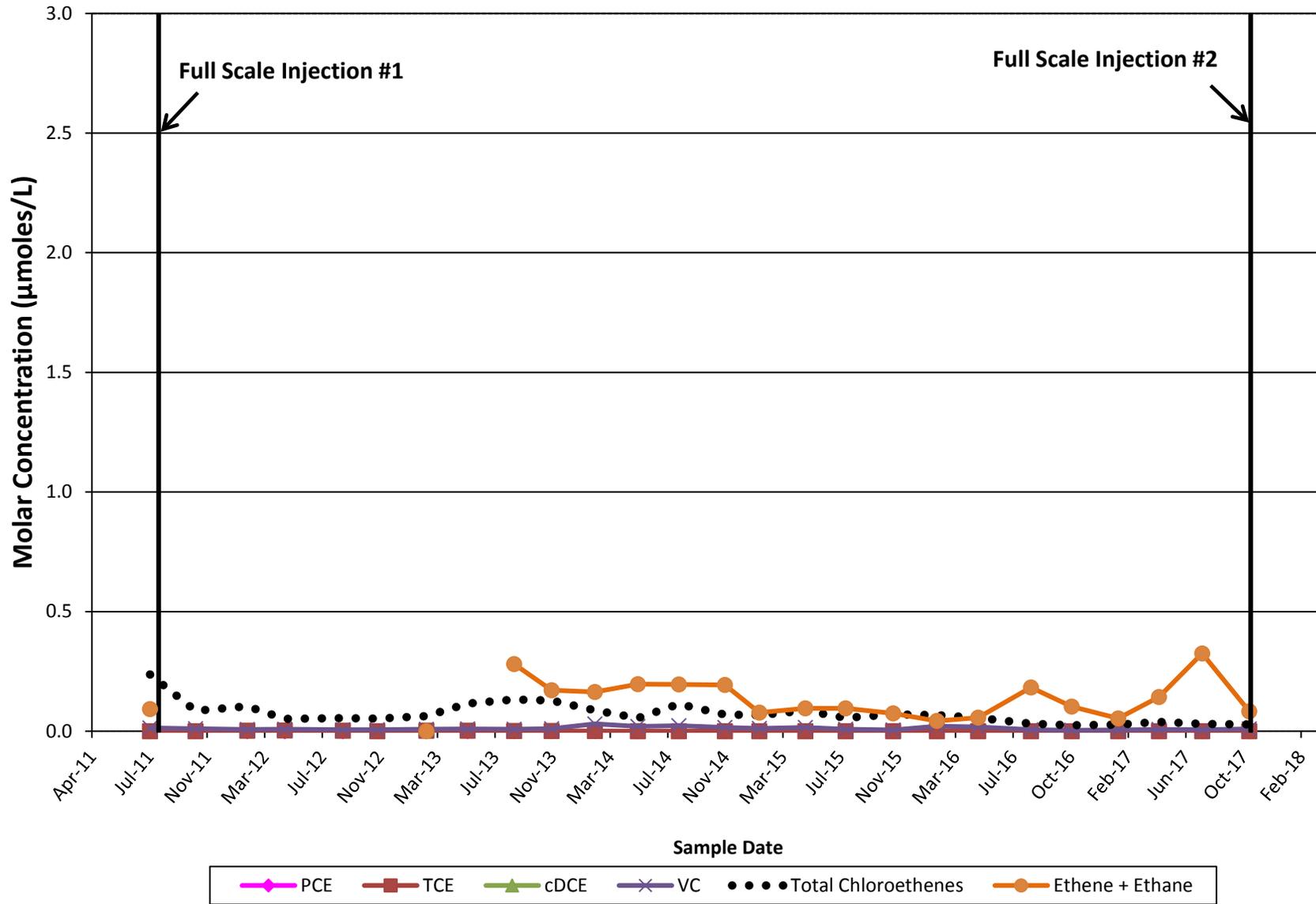
Figure
C-6



Boeing Developmental Center
Tukwila, Washington

**Molar Equivalents
Monitoring Well BDC-05-20 VOCs**

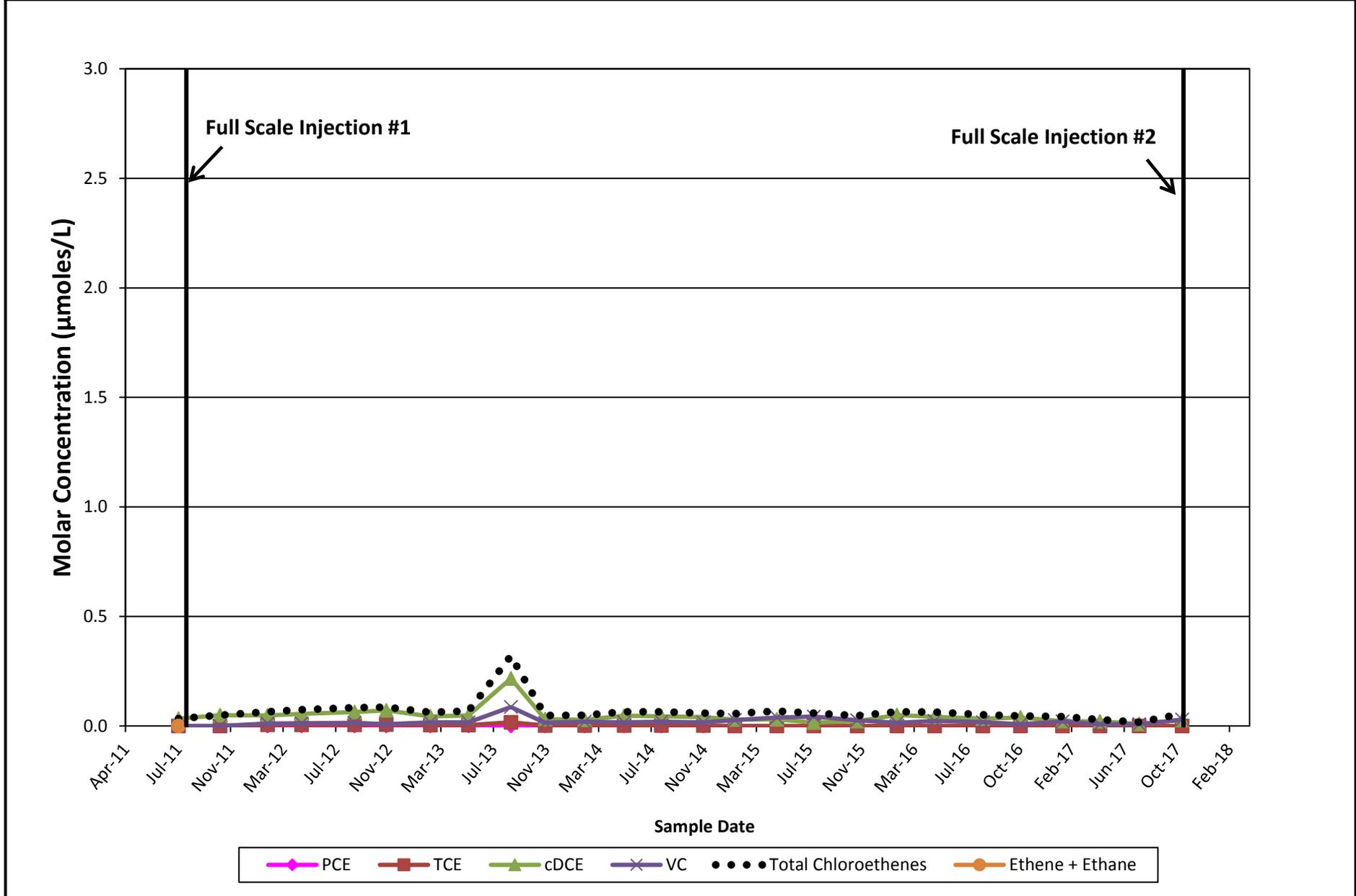
Figure
C-7



Boeing Developmental Center
Tukwila, Washington

**Molar Equivalents
Monitoring Well BDC-05-21 VOCs**

Figure
C-8

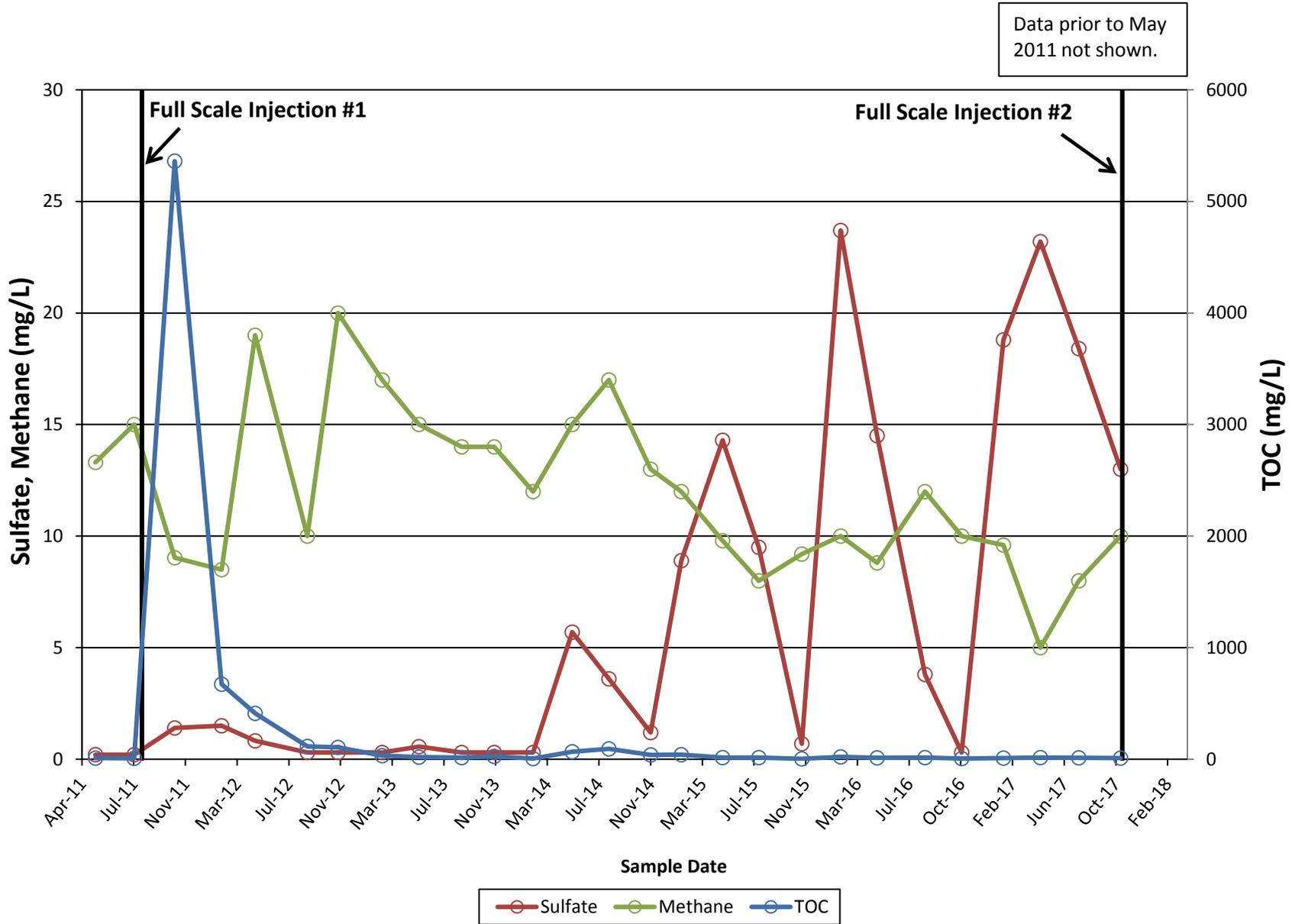


Boeing Developmental Center
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**Molar Equivalents
Monitoring Well BDC-05-23 VOCs**

Figure
C-9

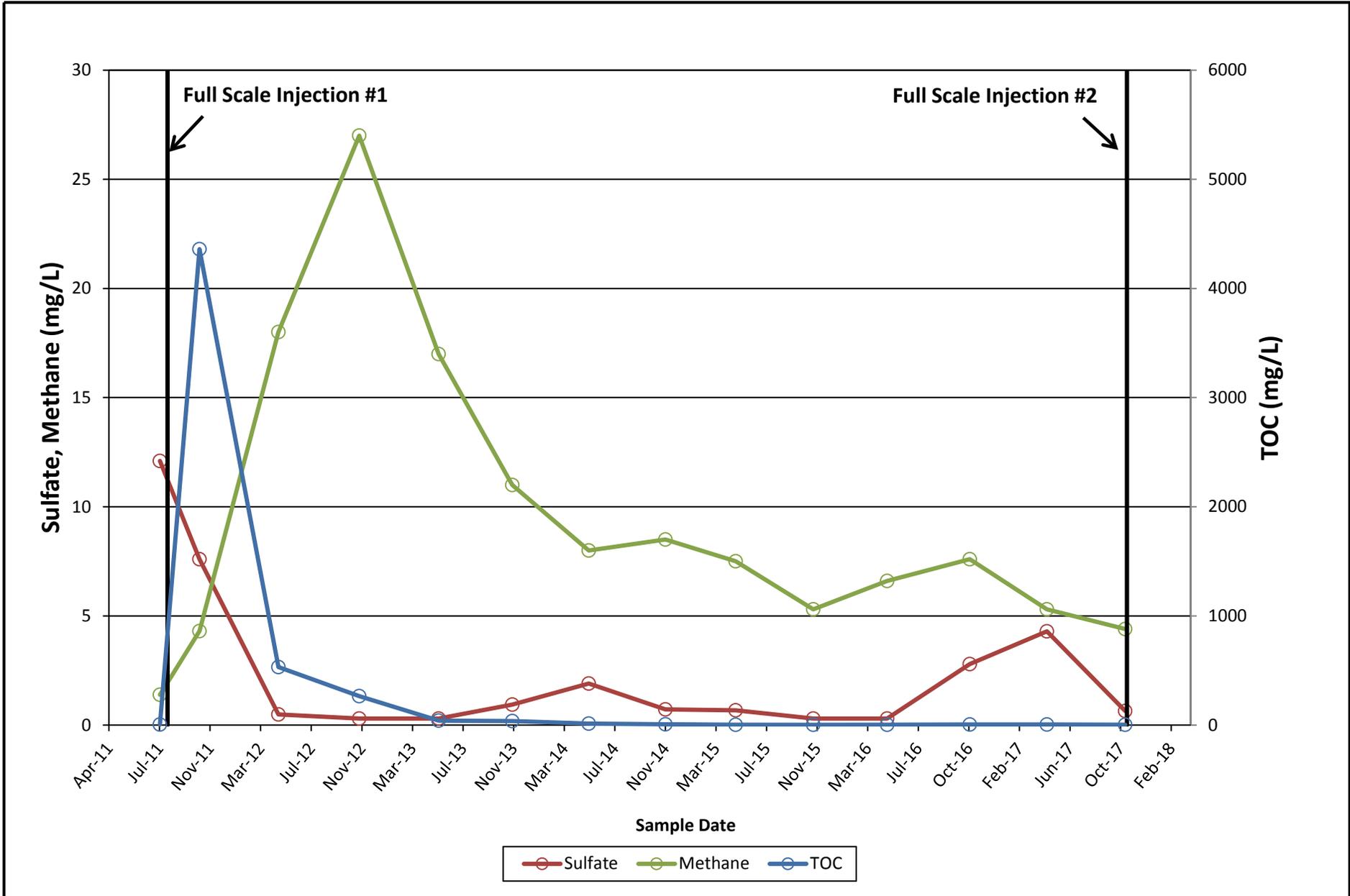
Time Plots – Aquifer Redox Parameters and TOC



Boeing Developmental Center
Tukwila, Washington

Redox and TOC
Source Zone Injection Well BDC-05-02

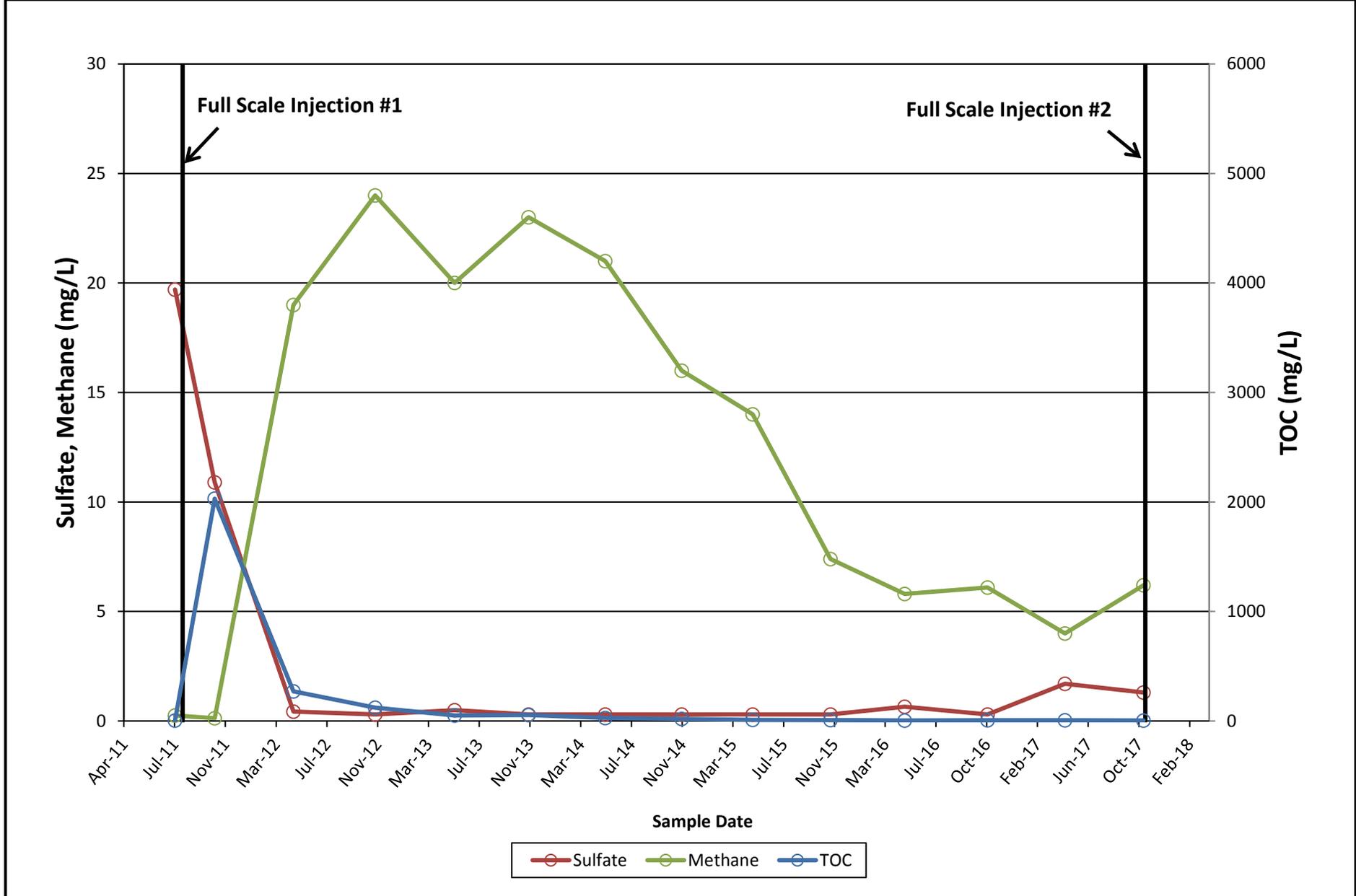
Figure
D-1



Boeing Developmental Center
Tukwila, Washington

Redox and TOC
Plume Injection Well BDC-05-09

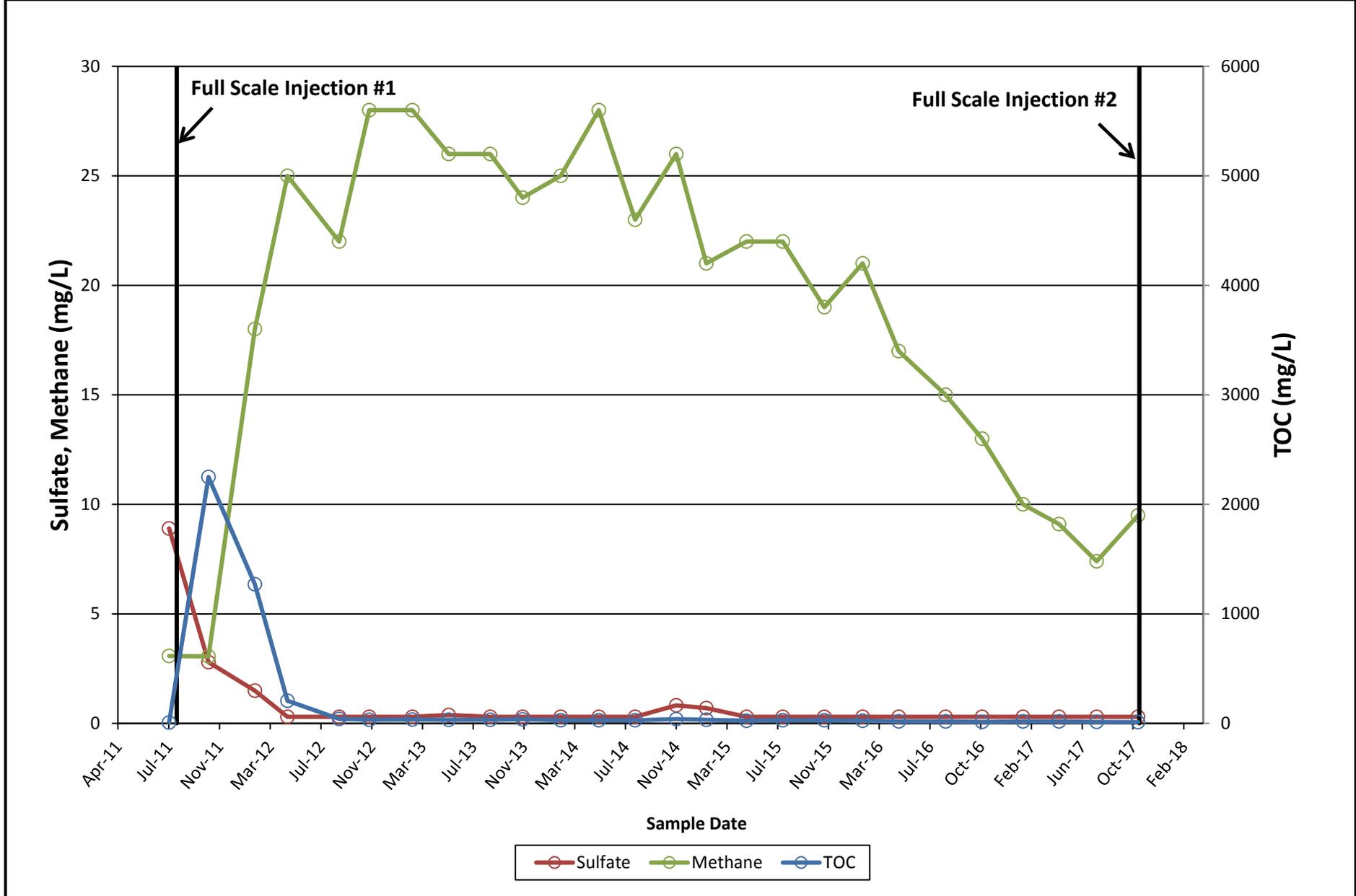
Figure
D-3



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**Redox and TOC
Plume Injection Well BDC-05-10**

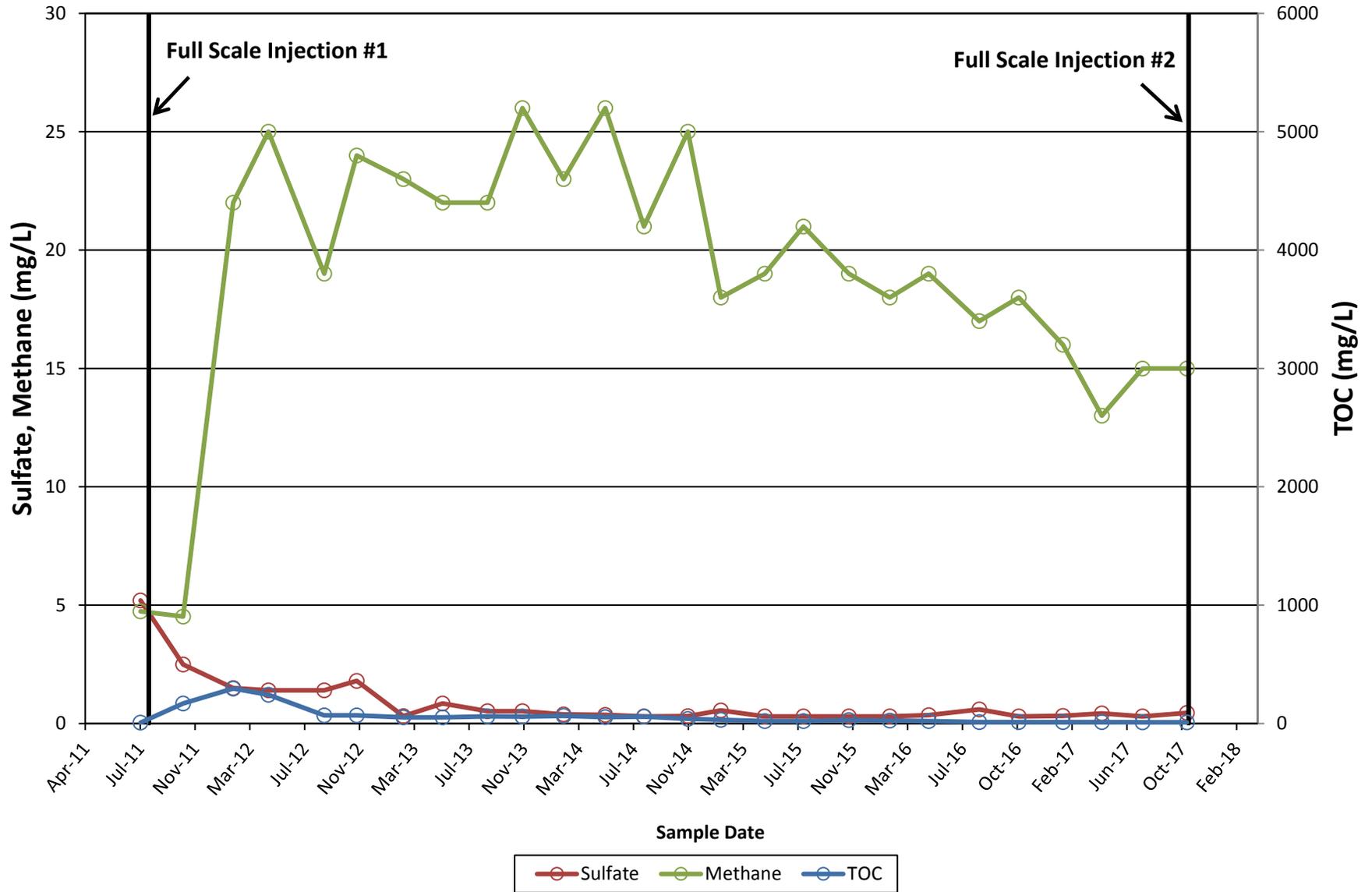
Figure
D-4



Boeing Developmental Center
Tukwila, Washington

**Redox and TOC
Plume Injection Well BDC-05-16**

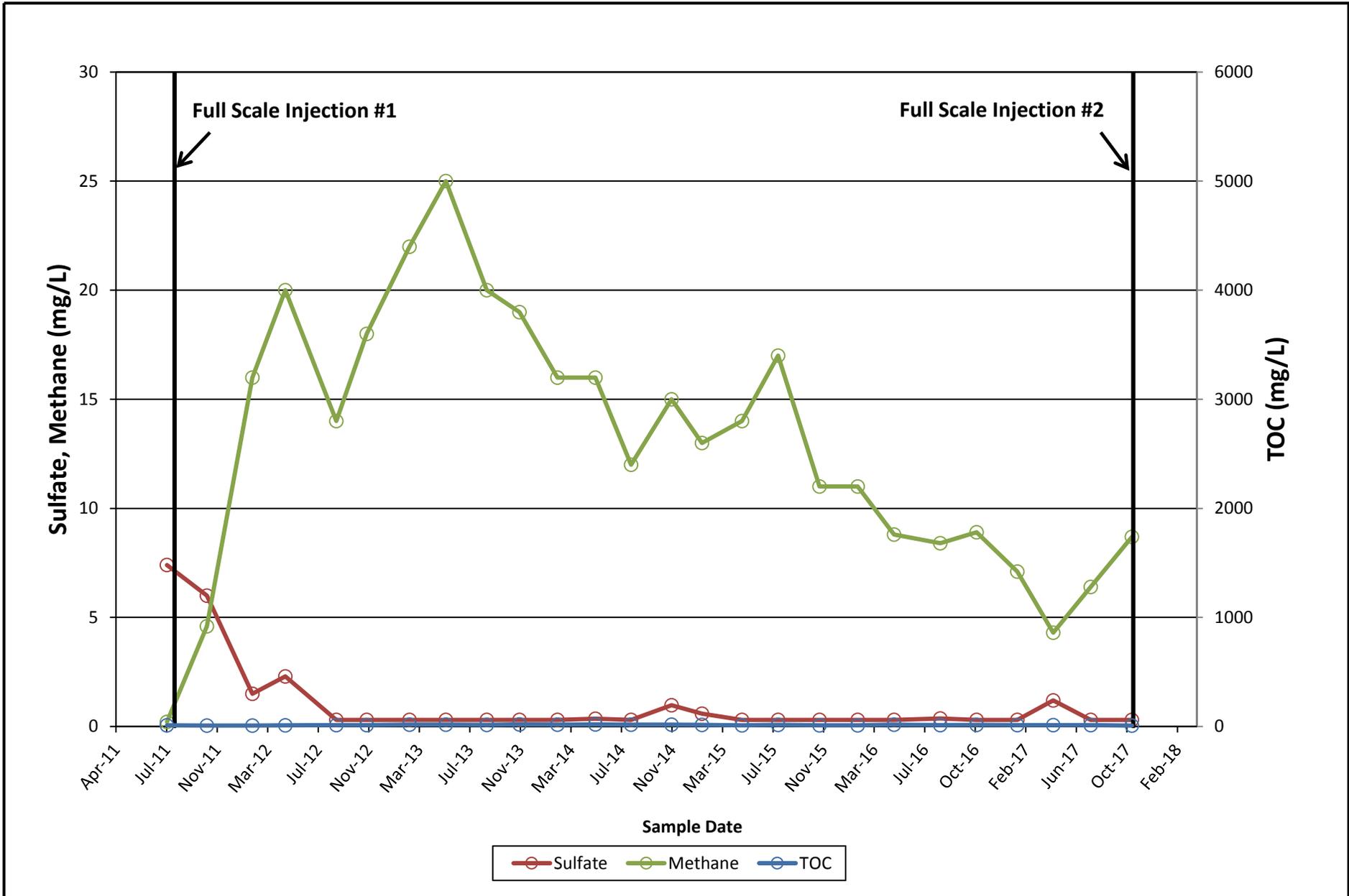
Figure
D-5



Boeing Developmental Center
Tukwila, Washington

**Redox and TOC
Monitoring Well BDC-05-19**

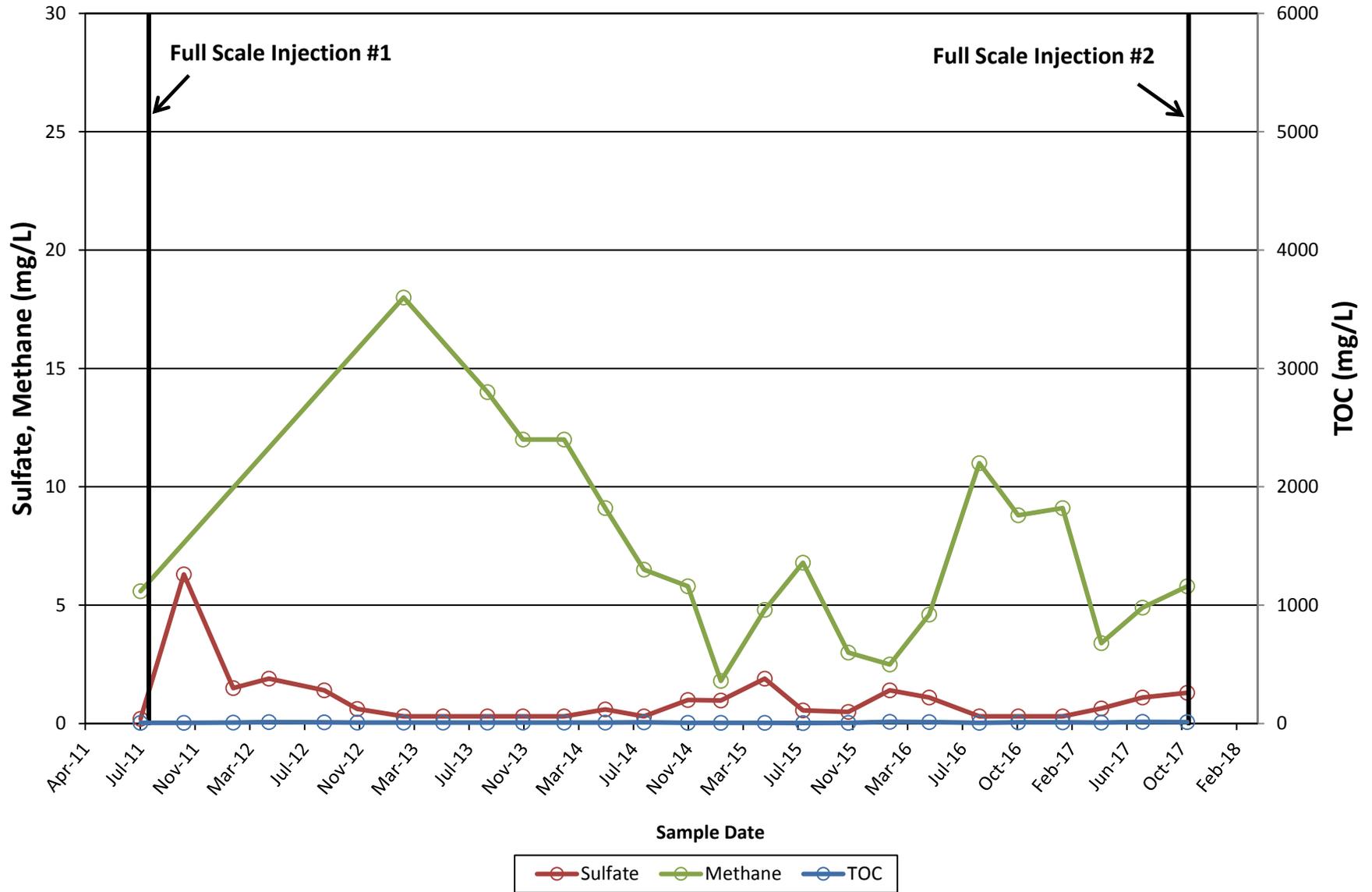
Figure
D-6



Boeing Developmental Center
Tukwila, Washington

**Redox and TOC
Monitoring Well BDC-05-20**

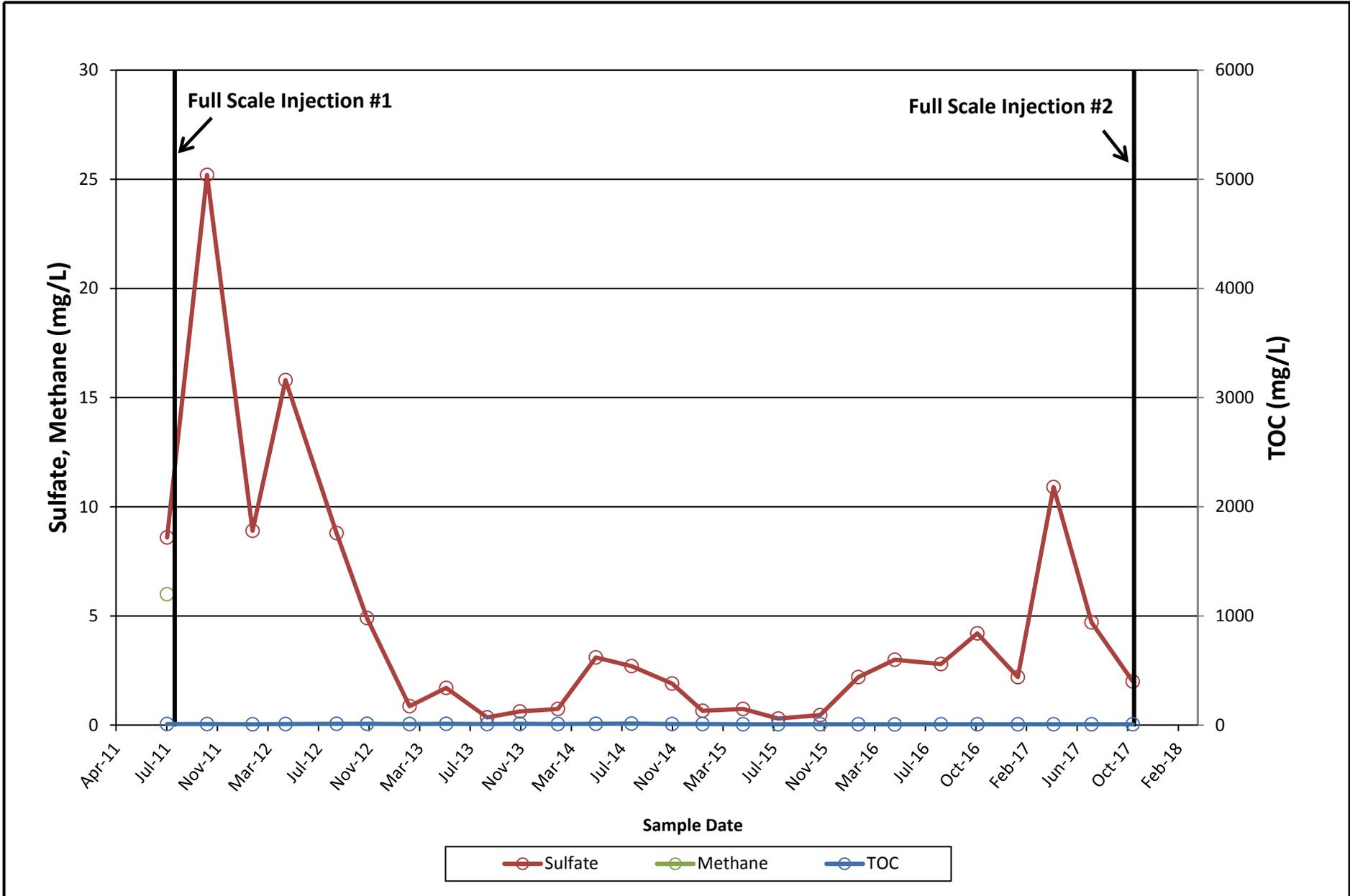
Figure
D-7



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Tukwila, Washington

**Redox and TOC
Monitoring Well BDC-05-21**

Figure
D-8

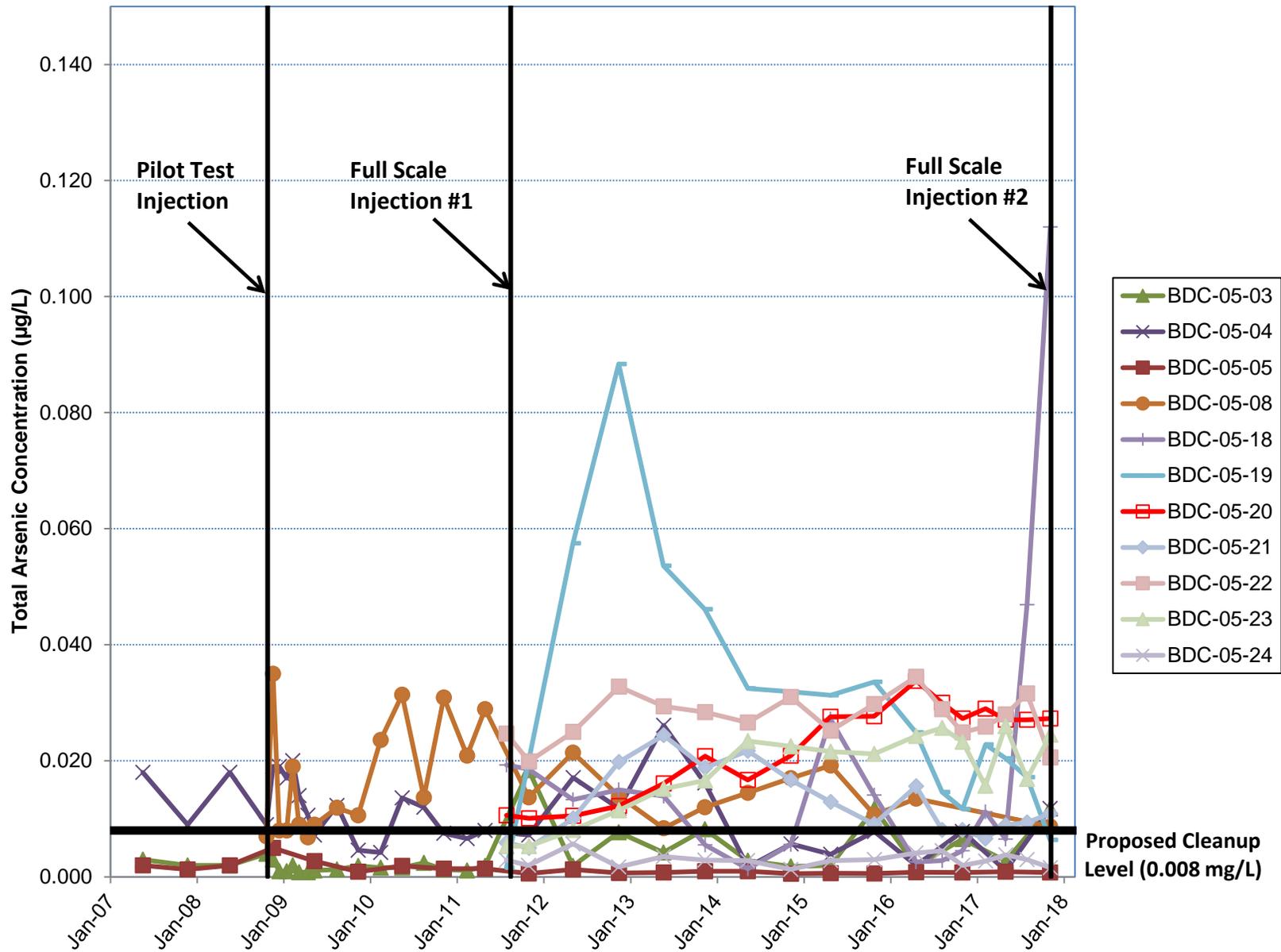


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**Redox and TOC
Monitoring Well BDC-05-23**

Figure
D-9

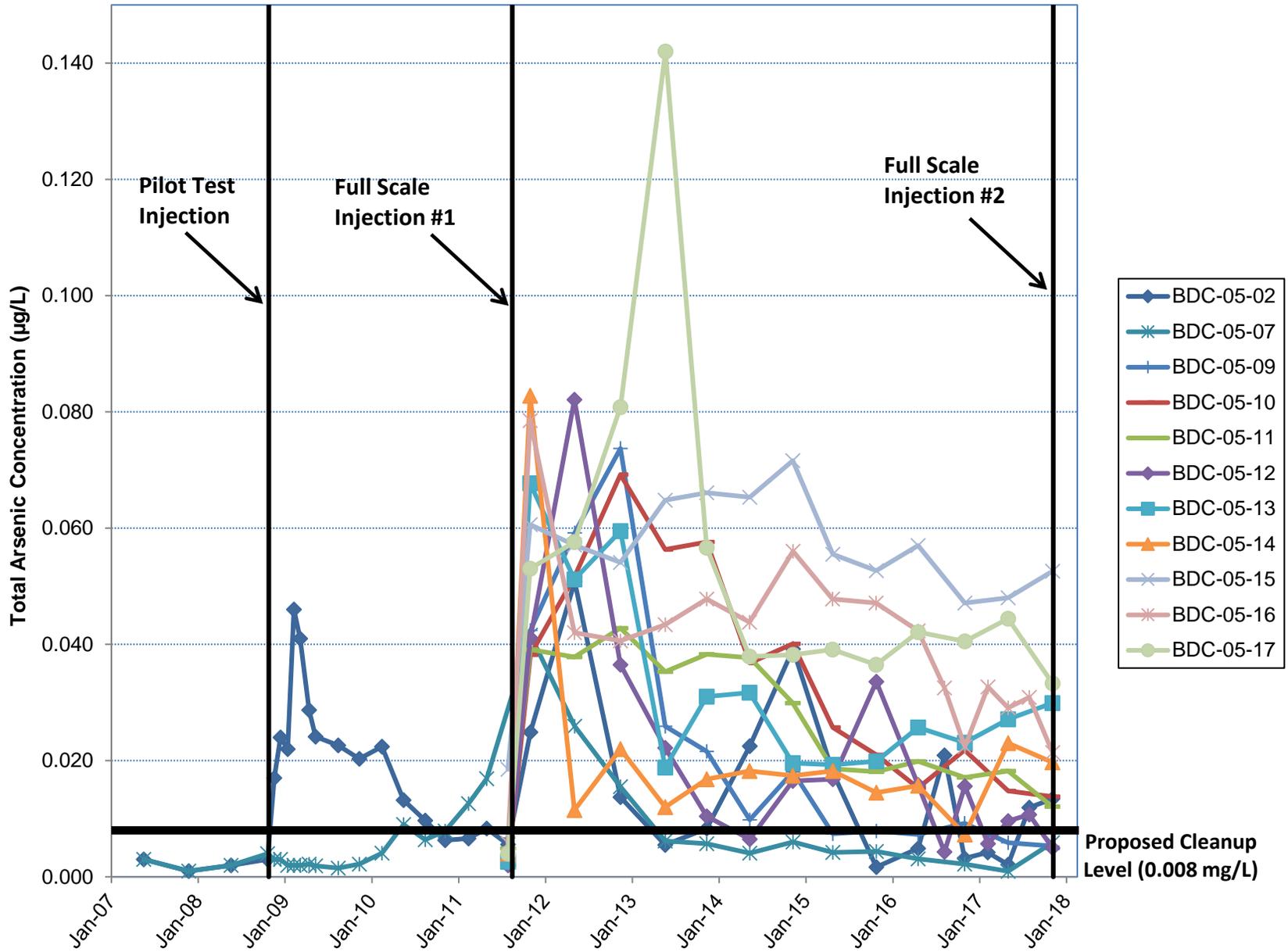
Time Plots – Copper and Arsenic



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Tukwila, Washington

Total Arsenic – Monitoring Wells

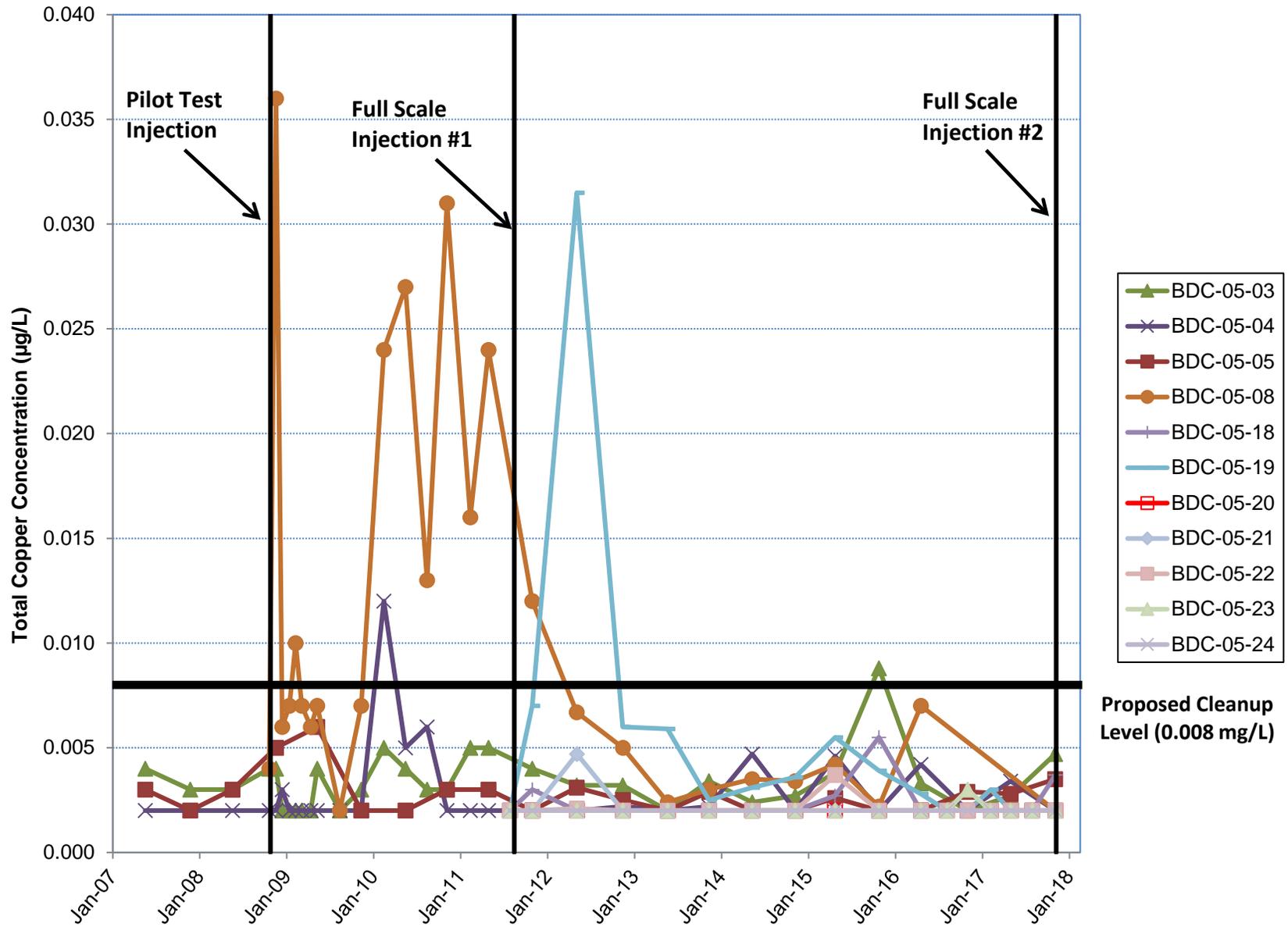
Figure
E-1



Boeing Developmental Center
Tukwila, Washington

Total Arsenic – Injection Wells

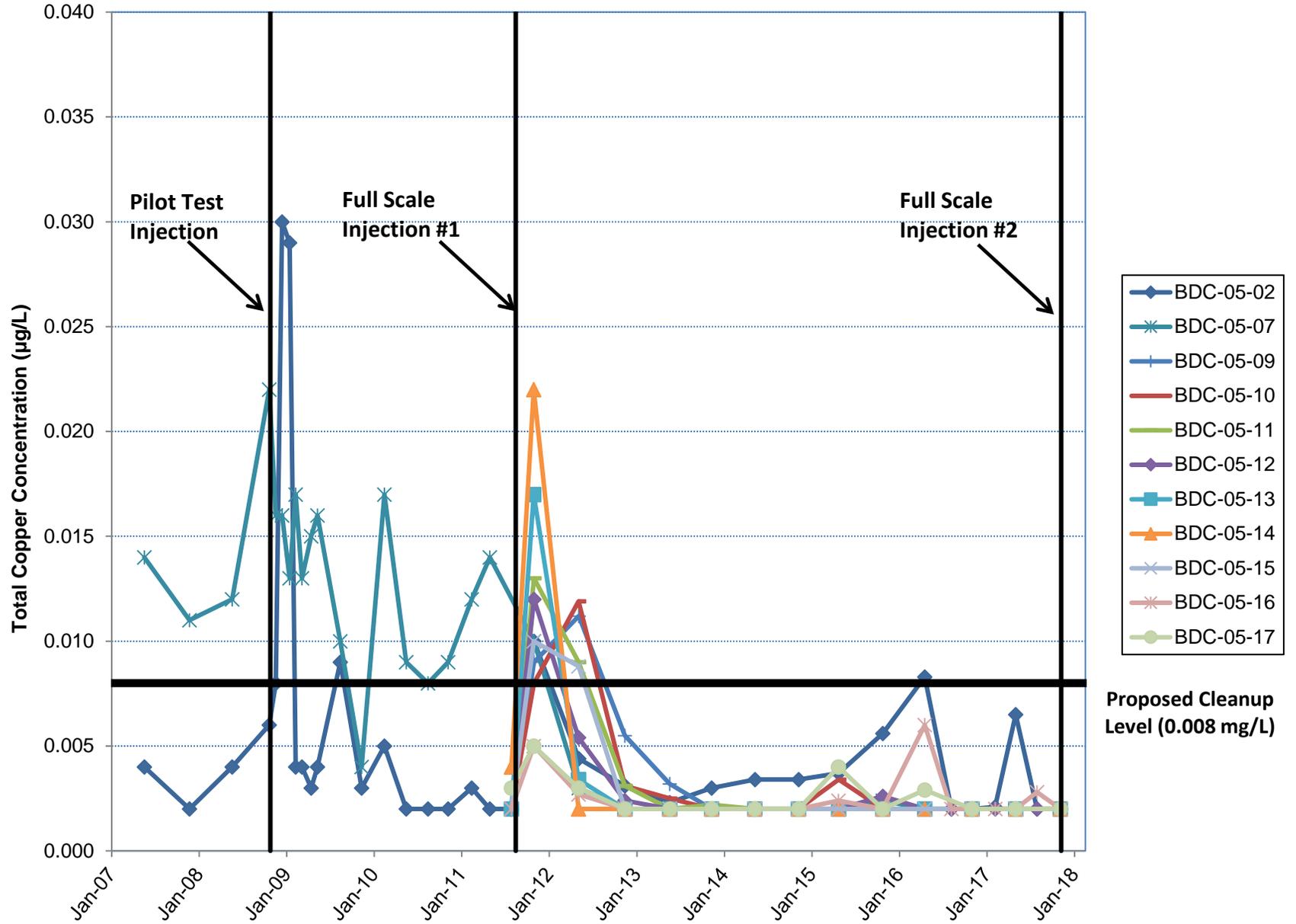
Figure
E-2



Boeing Developmental Center
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Total Copper – Monitoring Wells

Figure
E-3



Boeing Developmental Center
Tukwila, Washington

Total Copper – Injection Wells

Figure
E-4

