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## **APRON A INVESTIGATION RESULTS**

Renton Municipal Airport – Boeing Apron A  
Renton, Washington

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## **APRON A INVESTIGATION RESULTS**

### **Renton Municipal Airport – Boeing Apron A Renton, Washington**

#### **1.0 INTRODUCTION**

This report details methods and results of the April 2016 additional investigation that was conducted to assess subsurface contamination in and near Apron A, which is near a construction area within the Renton Municipal Airport in Renton, Washington (Figure 1). Previous soil and groundwater sampling conducted at Apron A identified vinyl chloride in a groundwater sample collected from a direct-push boring installed to assess soil and groundwater prior to construction activities. The objective of the additional investigation was to assess the extent of vinyl chloride contamination in the area of the boring.

#### **2.0 PREVIOUS INVESTIGATION RESULTS**

In September 2015 and in January/February 2016, several soil borings were completed to characterize soils and groundwater for disposal in the Apron A area construction site. Analyses included volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260C, metals, and petroleum hydrocarbons. The sample results indicated that most soils and groundwater were not contaminated. Appendix A contains tables showing the soil and groundwater analytical results for the samples collected during these two phases of investigation. It should be noted that soil samples were not collected from every boring during the September 2015 sampling event, because some of these borings were installed and logged solely for geotechnical purposes.

In February 2016, during the second round of sampling, a groundwater sample collected at boring B-15 contained vinyl chloride at a concentration of 16 micrograms per liter ( $\mu\text{g/L}$ ). *Cis*-1,2-dichloroethene (*cis*-1,2-DCE) also was detected in a soil sample from the same boring at a concentration of 2.9 micrograms per kilogram ( $\mu\text{g/kg}$ ).

Analytical results for the soil and groundwater sampling conducted near boring B-15 are summarized on Tables 1 and 2. Figure 2 shows the location of boring B-15 and the closest borings, B-14, B-16, and B-17. Copies of the laboratory reports can be found in Appendix B. As shown on Figure 2 and Tables 1 and 2, only samples from boring B-15 were found to have detectable concentrations of vinyl chloride or *cis*-1,2-DCE. Trichloroethene (TCE) was included in Tables 1 and 2 and Figure 2 as it is commonly found in conjunction with its degradation products. A follow-up investigation to delineate



the vinyl chloride contamination observed in the B-15 groundwater sample was conducted in April 2016, as described in Section 3.0.

### **3.0 APRIL 2016 FOLLOW-UP INVESTIGATION**

Because an elevated concentration of vinyl chloride was detected in groundwater at boring B-15, an additional investigation was conducted in April 2016 to further assess this contamination. In the April 2016 investigation, borings were advanced using direct-push drilling techniques to a total depth of approximately 18 feet below ground surface (bgs). Sample collection and handling was conducted in accordance with the Washington State Department of Ecology-approved Apron A Additional Investigation Work Plan (Amec Foster Wheeler, 2016a).

All borings were logged by an Amec Foster Wheeler field geologist and the boring logs are located in Appendix C. Soil samples were described using the Unified Soil Classification System in accordance with ASTM International Method D-2488-09a, Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Two discrete soil samples were collected—one from the water table and one from 15 feet bgs—unless field observations indicated otherwise. Soil sampling procedures for VOCs used EPA Method 5035A, following Implementation Memo #5: Collecting and Preparing Soil Samples for VOC Analysis (Ecology, 2004), and the Quality Assurance Project Plan for the facility (Amec Foster Wheeler, 2016b). Sampling method 5035A uses a discrete soil sampler to minimize VOC loss and requires storing the soil samples in 40-milliliter glass vials with Teflon septa. The soil samples were analyzed using EPA Method 8260C.

Once the borings were complete, a 2-inch diameter monitoring well was installed in each boring. The boring/well locations are shown on Figure 2. The wells were installed by Cascade Drilling, a Washington State licensed well driller. The wells were constructed using 2-inch diameter, Schedule 40 flush-thread polyvinyl chloride casing. All of the wells were constructed using pre-packed well screens, in which the sand pack medium is held in place by a mesh screen secured to the outside of the well casing. After the boring had been logged, a “macro-core” 3.5-inch-diameter core casing was driven back through the narrower direct-push boring to the total depth. The plug at the end of the core barrel was removed, and the pre-pack well screen and well casing were assembled and lowered into the core barrel.

Loose filter pack sand was added slowly into the annulus as the core barrel was retracted. The filter pack sand was used to stabilize the well screen and casing as the core was removed. Once the loose filter pack was approximately 1 to 2 feet above the top of the pre-packed well screen, bentonite chips were used to seal the boring. The bentonite chips were then hydrated after placement, and the

flush-mounted well monument was then cemented around the well to protect it. Because the wells were installed in Apron A and near the Apron D Bridge, it was necessary to use heavy duty Sherwood cast aluminum well covers due to jet traffic. The wells were developed after installation. The monitoring well construction details are provided on Table 3.

The initial groundwater samples from these wells were collected and analyzed for a full list of VOCs using EPA Method 8260C with selected ion monitoring (SIM) analysis conducted for the solid waste management unit (SWMU) 172/174 constituents of concern (COCs): 1,1-dichloroethene, *cis*-1,2-DCE, tetrachloroethene, TCE, and vinyl chloride. The well locations will be surveyed for location and the top-of-casing elevations.

Samples were submitted to Analytical Resources, Inc., of Tukwila, Washington, a Washington State certified analytical laboratory. Results are summarized on Tables 4 and 5 and copies of the laboratory reports can be found in Appendix B.

### 3.1 APRIL 2016 SOIL SAMPLING RESULTS

Four borings were advanced to evaluate vinyl chloride concentrations in soil surrounding boring B-15, and monitoring wells were subsequently installed in the borings and identified as GW262S, GW263S, GW264S, and GW265S. One sample was collected from between 7 to 8.5 feet bgs and another sample was collected from 15 feet bgs at each of the four new boring locations. The samples were analyzed for VOCs and total organic carbon. Analytical results for these samples are presented in Table 4. Vinyl chloride was detected in the 15 feet bgs samples collected from GW263 and GW264 at concentrations of 6.5 and 37 µg/kg, respectively. Other compounds detected in the soil samples include 2-butanone, acetone, carbon disulfide, and methylene chloride.

### 3.2 APRIL 2016 GROUNDWATER SAMPLING RESULTS

Results of the April 2016 groundwater sampling event are presented in Table 5 and shown on Figure 2. Vinyl chloride was detected in the groundwater samples collected from every monitoring well at concentrations ranging from 0.42 µg/L in the GW265S sample to 8.7 µg/L in the GW264S sample. The vinyl chloride concentrations in the groundwater from all of the wells exceed the SWMU-172/174 vinyl chloride cleanup level of 0.11 µg/L. *Cis*-1,2-DCE also was detected in the groundwater samples collected from every monitoring well at concentrations ranging from 0.044 µg/L in the GW262S sample to 0.31 µg/L in the field duplicate collected with the GW265S sample. These concentrations exceed the SWMU-172/174 *cis*-1,2-DCE cleanup level of 0.03 µg/L. However, the *cis*-1,2-DCE cleanup level was lowered at SWMU-172/174 due to the presence of TCE and tetrachloroethene and the overall combined risks associated with these two COCs. In addition, there are no applicable



surface water quality standards for *cis*-1,2-DCE. Therefore, based on no detections of 1,1-dichloroethene, tetrachloroethene, or TCE, using SIM methods to achieve the lowest available reporting limits, a vinyl chloride cleanup level of 0.2 µg/L is proposed for the Apron A area. Other minor compounds detected in the groundwater samples include 2-butanone, acetone, and toluene.

#### **4.0 CONCLUSIONS AND RECOMMENDATIONS**

In the February 2015 round of sampling, a groundwater sample from boring B-15 had detections of vinyl chloride at 16 µg/L. An additional investigation was conducted in April 2016 to assess the extent of affected groundwater in the area around boring B-15. Results of groundwater sampling presented in Figure 2 indicate that the approximate source area is located nearest to B-15/GW264S.

To address the elevated concentrations of vinyl chloride in groundwater at Apron A, Boeing is planning to implement a bioremediation remedy using a ten percent sugar substrate to the southernmost of the planned Apron A excavation trenches. Substrate will also be injected into wells GW262S, GW263S, GW264S and GW265S. Boeing proposes to collect follow-up groundwater samples from these four wells after completion of Apron A dewatering and construction, a substrate injection work plan will be submitted to Ecology for review and approval. Boeing will evaluate groundwater conditions on a semi-annual basis at wells GW262S and GW264S starting in the fourth quarter (November) of 2016.

#### **5.0 REFERENCES**

- Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler), 2016a, Apron A Additional Investigation Work Plan, Renton Airport – Boeing Apron A, Renton, Washington.
- Amec Foster Wheeler, 2016b, Quality Assurance Project Plan, Boeing Renton Facility, Renton, Washington, February.
- Washington State Department of Ecology (Ecology), 2004, Implementation Memorandum #5: Collecting and Preparing Soil Samples for VOC Analysis, Pub. 04-09-087, June 17.



**TABLE 1**  
**BOEING RENTON APRON A SELECT SOIL ANALYTICAL RESULTS**  
**JANUARY 30 AND FEBRUARY 5 AND 20, 2016<sup>1,2</sup>**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

Constituent (µg/kg)	Screening Level <sup>3</sup> Depth (feet bgs)	Sample ID							
		Apron A B-14		Apron A B-15		Apron A B-16		Apron A B-17	
		0-6	0-5	6-12	0-7	7-15	0-7	7-15	
cis-1,2-Dichloroethene	3	1.3 U	<b>2.9</b>	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	
Trichloroethene	6	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	
Vinyl Chloride	4	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	

Notes

1. Data qualifiers are as follows:

U = The analyte was not detected at the reporting limit indicated.

2. **Bold Values** = detected above laboratory reporting limits.

3. Screening levels are the soil cleanup levels for SWMU-172/174 from Table 2 of the Cleanup Action Plan.

Abbreviations

µg/kg = micrograms per kilogram

bgs = below ground surface

MTCA = Model Toxics Control Act

**TABLE 2**  
**BOEING RENTON APRON A SELECT GROUNDWATER ANALYTICAL RESULTS**  
**FEBRUARY 5 AND 20, 2016**<sup>1, 2</sup>  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

Constituent (µg/L)	Screening Level <sup>3</sup>	Sample ID		
		Apron A B-15-GW	Apron-A-B-16-GW	Apron-A-B-17-GW
cis-1,2-Dichloroethene	0.03	0.2 U	0.2 U	0.2 U
Trichloroethene	0.02	0.2 U	0.2 U	0.2 U
Vinyl Chloride	0.11	<b>16</b>	0.2 U	0.2 U

Notes

1. Data qualifiers are as follows:  
U = The analyte was not detected at the reporting limit indicated.
2. **Bold Values** = detected above laboratory reporting limits.
3. Screening levels are the groundwater cleanup levels for SWMU-172/174 from Table 2 of the Cleanup Action Plan.

Abbreviations

µg/L = micrograms per liter

**TABLE 3**

**CONSTRUCTION DETAILS FOR GROUNDWATER MONITORING WELLS<sup>1</sup>**

Renton Municipal Airport - Boeing Apron A  
Renton, Washington

Well ID	Drilling Method	Installation Date	Total Borehole Depth (feet bgs)	Total Well Depth <sup>2</sup> (feet bgs)	Diameter (inches)	Material	Screen Slot Size	Screen Interval (feet bgs)	Filter Pack Sand Type	Filter Pack Interval (feet bgs)	Seal Interval (feet bgs)	Surface Seal
GW-262S	Direct Push	4/14/2016	18	18	2	SCH 40 PVC	0.01	8 - 18	2/12 Silica	6 - 18	2 - 6	Flush Mount
GW-263S	Direct Push	4/15/2016	18	18	2	SCH 40 PVC	0.01	8 - 18	2/12 Silica	6 - 18	2 - 6	Flush Mount
GW-264S	Direct Push	4/14/2016	18	18	2	SCH 40 PVC	0.01	8 - 18	2/12 Silica	6 - 18	2 - 6	Flush Mount
GW-265S	Direct Push	4/14/2016	18	18	2	SCH 40 PVC	0.01	8 - 18	2/12 Silica	6 - 18	2 - 6	Flush Mount

Notes:

1. All wells equipped with Sherwood heavy-duty well monuments.
2. Total well depths are approximate.

Abbreviations

bgs = below ground surface  
PVC = polyvinyl chloride  
SCH = schedule

**TABLE 4**  
**BOEING RENTON APRON A SOIL ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 14 AND 15, 2016**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

Sample Depth (feet bgs)	Screening Level <sup>3</sup>	SAMPLE ID								
		GW262S		GW263S		GW264S		GW265S		
		8	15	7.5	15	7	15	8.5	8.5 field dup.	15
<b>Constituent</b>										
<b>Volatile Organic Compounds (µg/kg)</b>										
1,1,1,2-Tetrachloroethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,1,1-Trichloroethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,1,2,2-Tetrachloroethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane		3.1 U	5.7 U	2.9 U	6.2 U	3 U	9.3 U	5.4 U	5.2 U	2.3 U
1,1,2-Trichloroethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,1-Dichloroethane	1	1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,1-Dichloropropene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,2,3-Trichlorobenzene		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
1,2,3-Trichloropropane		3.1 U	5.7 U	2.9 U	6.2 U	3 U	9.3 U	5.4 U	5.2 U	2.3 U
1,2,4-Trichlorobenzene		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
1,2,4-Trimethylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,2-Dibromo-3-chloropropane		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
1,2-Dibromoethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,2-Dichlorobenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,2-Dichloroethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,2-Dichloropropane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,3,5-Trimethylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,3-Dichlorobenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,3-Dichloropropane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
1,4-Dichlorobenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
2,2-Dichloropropane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
2-Butanone		7.8 U	41	7.4 U	41	19	77	28	20	5.9 U
2-Chloroethylvinylether		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
2-Chlorotoluene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
2-Hexanone		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
4-Chlorotoluene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
4-Isopropyltoluene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
4-Methyl-2-Pentanone (MIBK)		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
Acetone		35	330	44	250	100	570	190	120	21
Acrolein		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U

**TABLE 4**  
**BOEING RENTON APRON A SOIL ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 14 AND 15, 2016**  
 Renton Municipal Airport - Boeing Apron A  
 Renton, Washington

Sample Depth (feet bgs)	Screening Level <sup>3</sup>	SAMPLE ID								
		GW262S		GW263S		GW264S		GW265S		
		8	15	7.5	15	7	15	8.5	8.5 field dup.	15
<b>Constituent</b>										
Acrylonitrile		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
Benzene	9	1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Bromobenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Bromochloromethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Bromodichloromethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Bromoethane		3.1 U	5.7 U	2.9 U	6.2 U	3 U	9.3 U	5.4 U	5.2 U	2.3 U
Bromoform		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Bromomethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Carbon Disulfide		1.6 U	<b>5.5</b>	1.5 U	3.1 U	<b>3.4</b>	<b>6.7</b>	2.7 U	2.6 U	<b>1.8</b>
Carbon Tetrachloride		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Chlorobenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Chloroethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Chloroform		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Chloromethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
cis-1,2-Dichloroethene	3	1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
cis-1,3-Dichloropropene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Dibromochloromethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Dibromomethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Ethylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Hexachlorobutadiene		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
Iodomethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Isopropylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
m,p-Xylene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Methylene Chloride		3.1 U	<b>10</b>	2.9 U	6.2 U	<b>4.3</b>	<b>18</b>	5.4 U	5.2 U	2.3 U
Naphthalene		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
n-Butylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
n-Propylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
o-Xylene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
sec-Butylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Styrene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
tert-Butylbenzene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Tetrachloroethene	10	1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U

**TABLE 4**  
**BOEING RENTON APRON A SOIL ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 14 AND 15, 2016**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

Sample Depth (feet bgs)	Screening Level <sup>3</sup>	SAMPLE ID								
		GW262S		GW263S		GW264S		GW265S		
		8	15	7.5	15	7	15	8.5	8.5 field dup.	15
<b>Constituent</b>										
Toluene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
trans-1,2-Dichloroethene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
trans-1,3-Dichloropropene		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
trans-1,4-Dichloro-2-butene		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
Trichloroethene	6	1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Trichlorofluoromethane		1.6 U	2.9 U	1.5 U	3.1 U	1.5 U	4.6 U	2.7 U	2.6 U	1.2 U
Vinyl Acetate		7.8 U	14 U	7.4 U	16 U	7.4 U	23 U	14 U	13 U	5.9 U
Vinyl Chloride	4	1.6 U	2.9 U	1.5 U	<b>6.5</b>	1.5 U	<b>37</b>	2.7 U	2.6 U	1.2 U
<b>Conventionals</b>										
Total Organic Carbon (percent)		--	<b>4.3</b>	--	<b>4.7</b>	--	<b>5.94</b>	--	--	<b>0.174</b>

Notes:

- Data qualifiers are as follows:  
U = The analyte was not detected at the reporting limit indicated.
- Bold Values** = detected above laboratory reporting limits.
- Screening levels are the soil cleanup levels for SWMU-172/174 from Table 1 of the Cleanup Action Plan.

Abbreviations:

µg/kg = micrograms per kilogram  
bgs = below ground surface  
field dup. = field duplicate

**TABLE 5**  
**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 19, 2016**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

	Screening Level <sup>3</sup>	SAMPLE ID				
		GW262S	GW263S	GW264S	GW265S	RGW265 field dup.
<b>Constituent</b>						
<b>Volatile Organic Compounds (µg/L)</b>						
1,1,1,2-Tetrachloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	0.057	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
1,1-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Butanone		5.5	5.0 U	5.6	5.0 U	5.0 U
2-Chloroethylvinylether		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorotoluene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

**TABLE 5**  
**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 19, 2016**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

	Screening Level <sup>3</sup>	SAMPLE ID				
		GW262S	GW263S	GW264S	GW265S	RGW265 field dup.
<b>Constituent</b>						
4-Chlorotoluene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Methyl-2-Pentanone (MIBK)		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetone		<b>25</b>	<b>16</b>	<b>23</b>	5.0 U	5.0 U
Acrolein		5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acrylonitrile		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzene	0.8	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Carbon Disulfide		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon Tetrachloride		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	0.03	<b>0.044</b>	<b>0.19</b>	<b>0.062</b>	<b>0.28</b>	<b>0.31</b>

**TABLE 5**  
**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 19, 2016**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

	Screening Level <sup>3</sup>	SAMPLE ID				
		GW262S	GW263S	GW264S	GW265S	RGW265 field dup.
<b>Constituent</b>						
cis-1,3-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Iodomethane		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
m,p-Xylene		0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Methylene Chloride	4.6	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Naphthalene		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
o-Xylene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Styrene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene	0.02	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Toluene		<b>1.4</b>	<b>0.95</b>	<b>0.46</b>	0.2 U	0.2 U
trans-1,2-Dichloroethene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

**TABLE 5**  
**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1,2</sup>**  
**APRIL 19, 2016**  
Renton Municipal Airport - Boeing Apron A  
Renton, Washington

	Screening Level <sup>3</sup>	SAMPLE ID				
		GW262S	GW263S	GW264S	GW265S	RGW265 field dup.
<b>Constituent</b>						
trans-1,4-Dichloro-2-butene		1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichloroethene	0.02	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Trichlorofluoromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Acetate		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	0.11	<b>1.7</b>	<b>1.3</b>	<b>8.7</b>	<b>0.42</b>	<b>0.44</b>

Notes

1. Data qualifiers are as follows:

U = The analyte was not detected at the reporting limit indicated.

2. **Bold Values** = detected above laboratory reporting limits.

3. Screening levels are the groundwater cleanup levels for SWMU-172/174 from Table 2 of the Cleanup Action Plan.

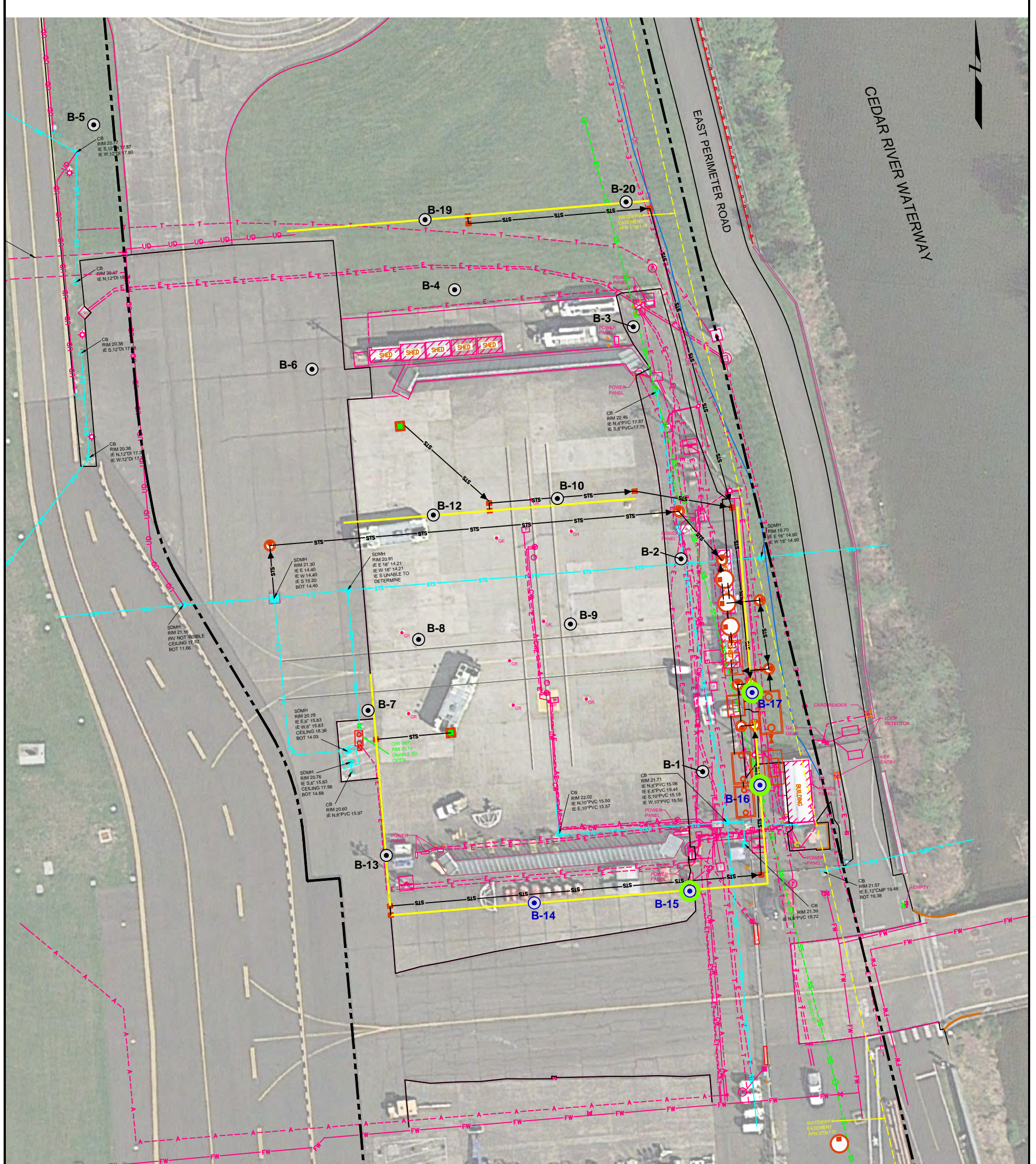
Abbreviations:

µg/L = micrograms per liter

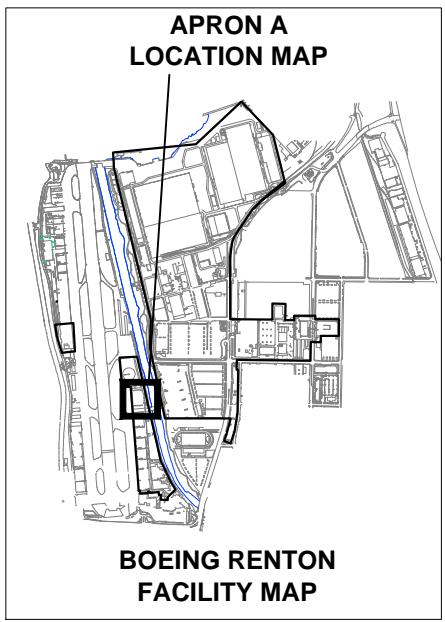
field dup. = field duplicate

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**FIGURES**



0 25 50  
 APPROXIMATE SCALE IN FEET



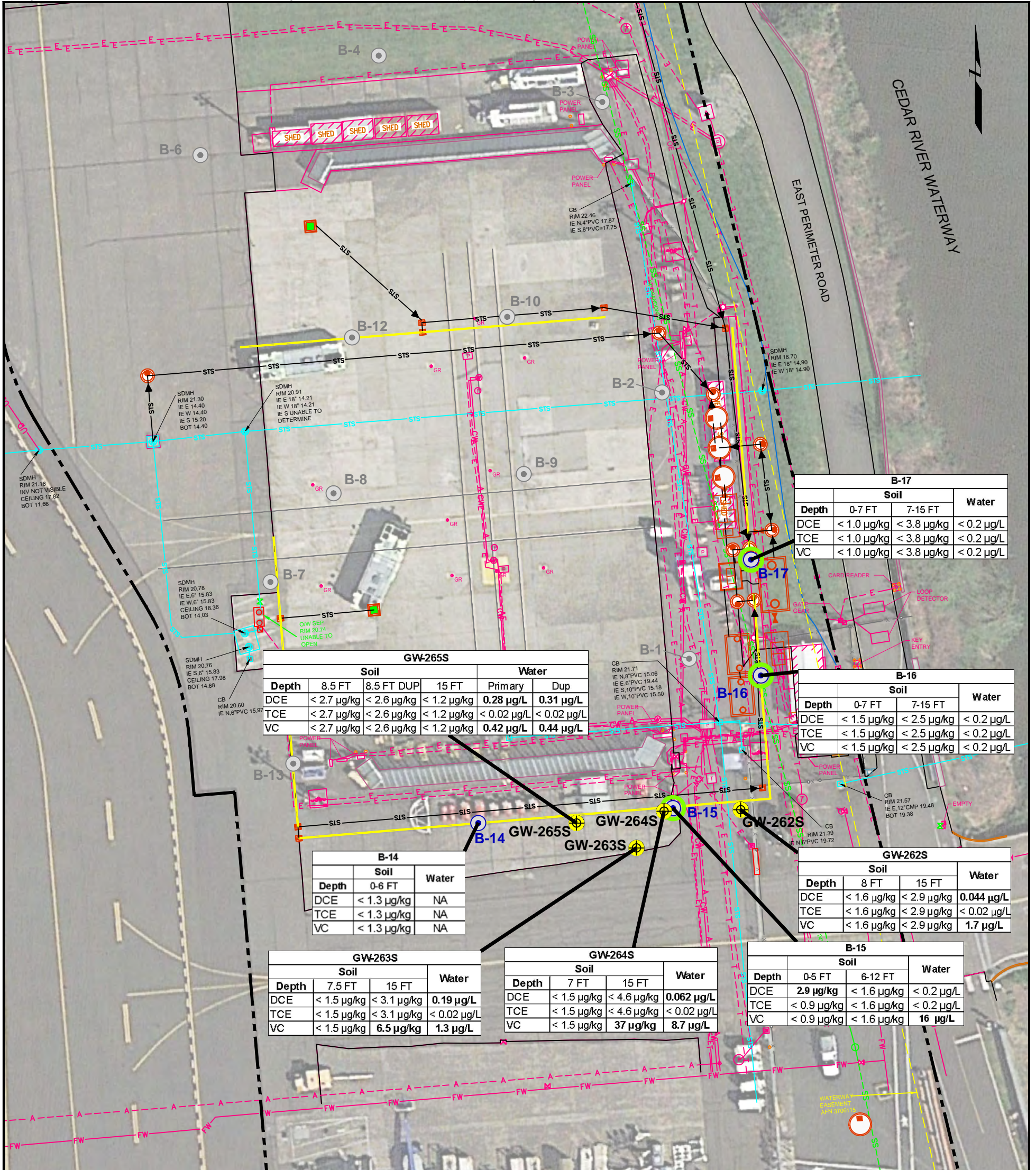
- LEGEND**
- ⊙ SOIL SAMPLE LOCATION
  - ⊙ SOIL AND GROUNDWATER SAMPLE LOCATION

- NOTES:**
1. SOIL SAMPLES AT B-4, B-5, B-6, B-7, B-10, B-12, B-13, B-14, B-15, B-16, B-17, B-19, AND B-20.
  2. BORINGS B-1, B-2, B-3, B-8, AND B-9 ONLY LOGGED FOR GEOTECHNICAL PURPOSES.
  3. BORINGS B-11 AND B-18 DO NOT EXIST.



**APRON A BORING LOCATIONS**  
 Renton Municipal Airport - Boeing Apron A  
 Renton, Washington

By: APS	Date: 05/16/16	Project No. 16096
Amec Foster Wheeler Environment & Infrastructure, Inc.		Figure <b>1</b>



GW-265S					
Depth	Soil			Water	
	8.5 FT	8.5 FT DUP	15 FT	Primary	Dup
DCE	< 2.7 µg/kg	< 2.6 µg/kg	< 1.2 µg/kg	<b>0.28 µg/L</b>	<b>0.31 µg/L</b>
TCE	< 2.7 µg/kg	< 2.6 µg/kg	< 1.2 µg/kg	< 0.02 µg/L	< 0.02 µg/L
VC	< 2.7 µg/kg	< 2.6 µg/kg	< 1.2 µg/kg	<b>0.42 µg/L</b>	<b>0.44 µg/L</b>

B-17			
Depth	Soil		Water
	0-7 FT	7-15 FT	
DCE	< 1.0 µg/kg	< 3.8 µg/kg	< 0.2 µg/L
TCE	< 1.0 µg/kg	< 3.8 µg/kg	< 0.2 µg/L
VC	< 1.0 µg/kg	< 3.8 µg/kg	< 0.2 µg/L

B-16			
Depth	Soil		Water
	0-7 FT	7-15 FT	
DCE	< 1.5 µg/kg	< 2.5 µg/kg	< 0.2 µg/L
TCE	< 1.5 µg/kg	< 2.5 µg/kg	< 0.2 µg/L
VC	< 1.5 µg/kg	< 2.5 µg/kg	< 0.2 µg/L

B-14		
Depth	Soil	Water
	0-6 FT	
DCE	< 1.3 µg/kg	NA
TCE	< 1.3 µg/kg	NA
VC	< 1.3 µg/kg	NA

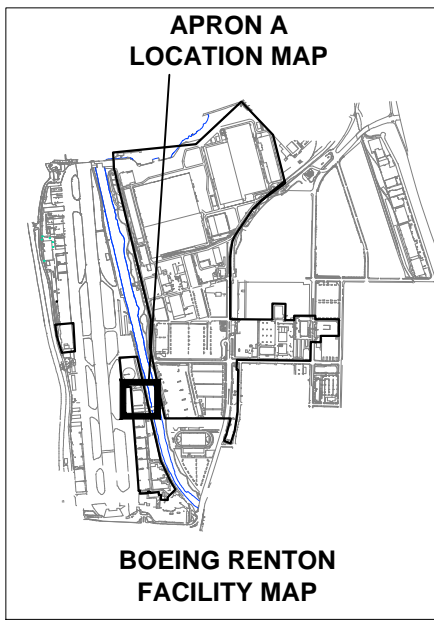
GW-262S			
Depth	Soil		Water
	8 FT	15 FT	
DCE	< 1.6 µg/kg	< 2.9 µg/kg	<b>0.044 µg/L</b>
TCE	< 1.6 µg/kg	< 2.9 µg/kg	< 0.02 µg/L
VC	< 1.6 µg/kg	< 2.9 µg/kg	<b>1.7 µg/L</b>

GW-263S			
Depth	Soil		Water
	7.5 FT	15 FT	
DCE	< 1.5 µg/kg	< 3.1 µg/kg	<b>0.19 µg/L</b>
TCE	< 1.5 µg/kg	< 3.1 µg/kg	< 0.02 µg/L
VC	< 1.5 µg/kg	<b>6.5 µg/kg</b>	<b>1.3 µg/L</b>

GW-264S			
Depth	Soil		Water
	7 FT	15 FT	
DCE	< 1.5 µg/kg	< 4.6 µg/kg	<b>0.062 µg/L</b>
TCE	< 1.5 µg/kg	< 4.6 µg/kg	< 0.02 µg/L
VC	< 1.5 µg/kg	<b>37 µg/kg</b>	<b>8.7 µg/L</b>

B-15			
Depth	Soil		Water
	0-5 FT	6-12 FT	
DCE	<b>2.9 µg/kg</b>	< 1.6 µg/kg	< 0.2 µg/L
TCE	< 0.9 µg/kg	< 1.6 µg/kg	< 0.2 µg/L
VC	< 0.9 µg/kg	< 1.6 µg/kg	<b>16 µg/L</b>

0 20 40  
 APPROXIMATE SCALE IN FEET



- LEGEND**
- GW-264S GROUNDWATER WELL LOCATION
  - B-1 SOIL SAMPLE LOCATION
  - B-16 SOIL AND GROUNDWATER SAMPLE LOCATION

- KEY**
- DCE = cis-1,2-Dichloroethene
  - TCE = Trichloroethene
  - VC = Vinyl Chloride
  - NA = Not Analyzed

- NOTES:**
1. SOIL SAMPLES AT B-4, B-5, B-6, B-7, B-10, B-12, B-13, B-14, B-15, B-16, B-17, B-19, AND B-20, GW-262S, GW-263S, GW-264S, AND GW-265S.
  2. BORINGS B-1, B-2, B-3, B-8, AND B-9 ONLY LOGGED FOR GEOTECHNICAL PURPOSES.
  3. BORINGS B-11 AND B-18 DO NOT EXIST.
  4. **BOLD INDICATES DETECTIONS.**



**INVESTIGATION SAMPLING RESULTS**  
 Renton Municipal Airport - Boeing Apron A  
 Renton, Washington

By: APS	Date: 05/16/16	Project No. 16096
Amec Foster Wheeler Environment & Infrastructure, Inc.		Figure <b>2</b>



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**APPENDIX A**

Soil and Groundwater Analytical Summary Tables



amec  
foster  
wheeler

TABLE A-1

**BOEING RENTON APRON A SOIL ANALYTICAL RESULTS** <sup>1, 2, 3, 4</sup>  
Renton Airport - Boeing Apron A  
Renton, Washington

Constituent	MTCA Cleanup Levels for Soil <sup>5</sup>	Sample ID															
		Apron-A-B4	Apron-A-B5	Apron-A-B6	Apron-A-B7	Apron-A-B10	Apron-A-B-12	Apron-A-B-13	Apron-A-B-14	Apron-A-B-15	Apron-A-B-16	Apron-A-B17	Apron-A-B-19	Apron-A-B-20			
		Depth (feet bgs)	0-11.5	0-11.5	0-11.5	0-11.5	0-11.5	0-6	0-7	0-6	0-5	6-12	0-7	7-15	0-7	7-15	0-5
Date collected	9/18/2015	9/18/2015	9/18/2015	9/17/2015	9/17/2015	1/30/2016	1/30/2016	1/30/2016	2/5/2016	2/20/2015	2/20/2015	2/5/2016	2/5/2016				
<b>Volatile Organic Compounds (µg/kg)</b>																	
1,1,1,2-Tetrachloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,1,1-Trichloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,1,2,2-Tetrachloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NE	3.6 U	2.7 U	2.6 U	3.0 U	3.1 U	2.2 UJ	2.9 U	2.7 U	1.9 U	3.3 U	3.1 U	5.0 U	1.9 U	7.6 U	2.2 U	2.0 U
1,1,2-Trichloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,1-Dichloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,1-Dichloroethene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,1-Dichloropropene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,2,3-Trichlorobenzene	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
1,2,3-Trichloropropane	NE	3.6 U	2.7 U	2.6 U	3.0 U	3.1 U	2.2 UJ	2.9 U	2.7 U	1.9 U	3.3 U	3.1 U	5.0 U	1.9 U	7.6 U	2.2 U	2.0 U
1,2,4-Trichlorobenzene	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
1,2,4-Trimethylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,2-Dibromo-3-chloropropane	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
1,2-Dibromoethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,2-Dichlorobenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,2-Dichloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,2-Dichloropropane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,3,5-Trimethylbenzene	800,000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,3-Dichlorobenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,3-Dichloropropane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
1,4-Dichlorobenzene	185,000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
2,2-Dichloropropane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
2-Butanone	48,000,000	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	18 J	15	17	4.6 U	9.2	7.6 U	42	4.8 U	31	5.4 U	5.5 J
2-Chloroethylvinylether	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
2-Chlorotoluene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
2-Hexanone	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
2-Pentanone	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Chlorotoluene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
4-Isopropyltoluene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	120 J	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
4-Methyl-2-Pentanone (MIBK)	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
Acetone	72,000,000	56	23	24	25	49	60 J	57	83	10	42	20	180	9.8	160	10	29
Acrolein	NE	91 U	68 U	65 U	74 U	76 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	11 J
Acrylonitrile	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
Benzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Bromobenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Bromochloromethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Bromodichloromethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Bromoethane	NE	3.6 U	2.7 U	2.6 U	3.0 U	3.1 U	2.3 J	2.9 U	2.7 U	1.9 U	3.3 U	3.1 U	5.0 U	1.9 U	7.6 U	2.2 U	2.0 U
Bromoform	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Bromomethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Carbon Disulfide	8,000,000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	2.2 J	1.5 U	1.3 U	0.9 U	3.1	1.5 U	2.6	1.0 U	4.8	1.1 U	1.0 U
Carbon Tetrachloride	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Chlorobenzene	1,600,000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Chloroethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Chloroform	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U



amec  
foster  
wheeler

TABLE A-1

**BOEING RENTON APRON A SOIL ANALYTICAL RESULTS** 1, 2, 3, 4  
Renton Airport - Boeing Apron A  
Renton, Washington

Constituent	MTCA Cleanup Levels for Soil <sup>5</sup>	Sample ID															
		Apron-A-B4	Apron-A-B5	Apron-A-B6	Apron-A-B7	Apron-A-B10	Apron-A-B-12	Apron-A-B-13	Apron-A-B-14	Apron-A-B-15	Apron-A-B-16	Apron-A-B-17	Apron-A-B-19	Apron-A-B-20			
	Depth (feet bgs)	0-11.5	0-11.5	0-11.5	0-11.5	0-11.5	0-6	0-7	0-6	0-5	6-12	0-7	7-15	0-7	7-15	0-5	0-5
Date collected	9/18/2015	9/18/2015	9/18/2015	9/17/2015	9/17/2015	1/30/2016	1/30/2016	1/30/2016	2/5/2016	2/20/2015	2/20/2015	2/20/2015	2/5/2016	2/5/2016			
<b>Volatile Organic Compounds (µg/kg)</b>																	
Chloromethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
cis-1,2-Dichloroethene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	2.9	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
cis-1,3-Dichloropropene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Dibromochloromethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Dibromomethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Ethylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Hexachlorobutadiene	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
Iodomethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Isopropylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	34 J	1.5 U	1.5	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
m,p-Xylene	9,000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Methylene Chloride	NE	3.6 U	2.7 U	2.6 U	3.0 U	3.1 U	2.2 UJ	2.9 U	2.7 U	1.9 U	3.3 U	3.1 U	5.0 U	1.9 U	7.6 U	2.2 U	2.0 U
Naphthalene	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	26 J	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
n-Butylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	140 J	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
n-Propylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	100 J	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
o-Xylene	9,000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
sec-Butylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	140 J	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Styrene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
tert-Butylbenzene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	18 J	1.5 U	1.5	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Tetrachloroethene	50	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Toluene	7000	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.5	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
trans-1,2-Dichloroethene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
trans-1,3-Dichloropropene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
trans-1,4-Dichloro-2-butene	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
Trichloroethene	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Trichlorofluoromethane	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
Vinyl Acetate	NE	9.1 U	6.8 U	6.5 U	7.4 U	7.6 U	5.4 UJ	7.3 U	6.7 U	4.6 U	8.2 U	7.6 U	12 U	4.8 U	19 U	5.4 U	5.0 U
Vinyl Chloride	NE	1.8 U	1.4 U	1.3 U	1.5 U	1.5 U	1.1 UJ	1.5 U	1.3 U	0.9 U	1.6 U	1.5 U	2.5 U	1.0 U	3.8 U	1.1 U	1.0 U
<b>Total Petroleum Hydrocarbons (mg/kg)</b>																	
Gasoline Range	100	11 U	8.7 U	9.0 U	16	10 U	310	12	10	8.7	11 U	8.1 U	20 U	7.1 U	19 U	7.8 U	8.8 U
Diesel range	2,000	12	9.9	7.0 U	25	9.6	17	20	24	11	14	8.2	20	7.9	12	6.7 U	6.6
Motor oil	2,000	58	47	33	120	48	65	79	75	46	74	38	200	31	48	14	43
<b>Total Metals (mg/kg)</b>																	
Aluminum	80,000	18,200	17,800	22,800	20,400	19,700	15,900	19,800	18,300	15,600	24,100	17,900	17,100	28,600	25,100	22,300	16,100
Arsenic	20	8	8	8	9	9	8	8	9	6 U	8 U	4.7	4.9	8.8	4.4	6 U	6 U
Barium	16,000	87.7	83.6	112	99.1	87.0	77.8	94.6	98.7	78.8	114	96.4	94	153	141	99.5	77.5
Cadmium	2	0.3 U	0.3 U	0.3 U	0.3 U	0.2 U	0.3 U	0.3 U	0.3 U	0.2 U	0.3 U	0.2	0.2 U	0.3	0.2 U	0.2 U	0.2 U
Calcium	NE	5,870	5,920	5,920	6,760	5,600	5,730	5,840	5,680	6,110	6,410	5,440	4,460	6,800	5,550	6,010	5,120
Chromium	2,000	38.3	33	45.1	39.1	37.2	33.2	37.6	33.1	33.7	47.0	32.9	28	54.2	39.9	40.0	38.3
Cobalt	NE	9.8	9.6	12.6	10.3	10.9	8.7	9.2	10.7	9.0	14.1	9.6	8.2	19.7	11.7	14.1	10.5
Copper	3,200	27.4	23.6	33.2	33.2	28.1	24.8	32.8	30.4	25.0	37.8	27.1	21	57.0	34.6	33.9	26.2
Iron	56,000	21,700	20,900	27,400	22,300	23,300	21,400	22,600	24,700	19,700	27,900	18,500	18,300	30,900	25,700	27,300	22,700
Lead	250	5	5	4	4	4	5	5	6	8	5	4.1	3.7	7.4	5.3	5	9
Magnesium	NE	6,750	6,370	7,550	6,660	6,790	6,630	6,340	7,010	6,690	8,150	8,030	3,970	10,100	7,100	7,440	6,630
Molybdenum	400	0.8	0.7	0.8	0.9	0.7	0.9	0.9	0.8	0.6 U	0.8 U	0.3	0.5	0.8	0.3 U	0.6 U	0.6 U
Nickel	1,600	34	30	39	33	33	35	32	34	40	42	36.1	25	59.6	37.2	39	45
Silver	400	0.4 U	0.4 U	0.4 U	0.5 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.5 U	0.2 U	0.4 U	0.3 U	0.3 U	0.4 U	0.4 U
Zinc	24,000	47	47	48	47	52	45	49	56	45	70	50	29	83	52	57	50

Notes

- Data qualifiers are as follows:  
 U = The analyte was not detected at the reporting limit indicated.  
 J = The value is an estimate.  
 UJ = The analyte was not detected at the estimated reporting limit indicated.
- Bold Values** = detected above laboratory reporting limits.
- No soil samples were collected at borings B-1, B-2, B-3, B-8, and B-9.
- Borings B-11 and B-18 do not exist.
- Cleanup level is the MTCA Method A cleanup level for industrial soils, or the lowest of the carcinogenic or non-carcinogenic cleanup level from MTCA Method B.

Abbreviations

µg/kg = micrograms per kilogram  
 bgs = below ground surface  
 mg/kg = milligrams per kilogram  
 MTCA = Model Toxics Control Act  
 NA = not analyzed  
 NE = not evaluated.



TABLE A-2

**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1, 2</sup>**  
**FEBRUARY 5 AND 20, 2016**  
 Renton Airport - Boeing Apron A  
 Renton, Washington

Constituent	MTCA Cleanup Levels for Groundwater	Sample ID <sup>3</sup>		
		Apron-A- B-15-GW	Apron-A-B-16-GW	Apron-A-B-17-GW
<b>Constituent</b>				
<b>Volatile Organic Compounds (µg/L)</b>				
1,1,1,2-Tetrachloroethane	NE	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	NE	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	NE	0.2 U	0.2 U	0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NE	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	NE	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	NE	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	NE	0.2 U	0.2 U	0.2 U
1,1-Dichloropropene	NE	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene	NE	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	NE	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	NE	0.5 U	0.5 U	0.5 U
1,2,4-Trimethylbenzene	NE	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane	NE	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane	NE	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	720	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	NE	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	NE	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene	80	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	NE	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane	NE	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	8.1	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane	NE	0.2 U	0.2 U	0.2 U
2-Butanone	NE	5.0 U	5.0 U	5.0 U
2-Chloroethylvinylether	NE	1.0 U	1.0 U	1.0 U
2-Chlorotoluene	NE	0.2 U	0.2 U	0.2 U
2-Hexanone	NE	5.0 U	5.0 U	5.0 U
4-Chlorotoluene	NE	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene	NE	0.2 U	0.2 U	0.2 U
4-Methyl-2-Pentanone (MIBK)	NE	5.0 U	5.0 U	5.0 U
Acetone	7,200	7.7	11	8.4
Acrolein	NE	5.0 U	5.0 U	5.0 U
Acrylonitrile	NE	1.0 U	1.0 U	1.0 U
Benzene	5	0.2 U	0.2 U	0.2 U
Bromobenzene	NE	0.2 U	0.2 U	0.2 U
Bromochloromethane	NE	0.2 U	0.2 U	0.2 U
Bromodichloromethane	0.71	0.2 U	0.2 U	0.2 U
Bromoethane	NE	0.2 U	0.2 U	0.2 U
Bromoform	5.5	0.2 U	0.2 U	0.2 U



TABLE A-2

**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1, 2</sup>**  
**FEBRUARY 5 AND 20, 2016**  
 Renton Airport - Boeing Apron A  
 Renton, Washington

	MTCA Cleanup Levels for Groundwater	Sample ID <sup>3</sup>		
		Apron-A- B-15- GW	Apron-A-B-16- GW	Apron-A-B-17- GW
<b>Constituent</b>				
Bromomethane	NE	1.0 U	1.0 U	1.0 U
Carbon Disulfide	800	0.2 U	0.2 U	0.2 U
Carbon Tetrachloride	NE	0.2 U	0.2 U	0.2 U
Chlorobenzene	160	0.2 U	0.2 U	0.2 U
Chloroethane	NE	0.2 U	0.2 U	0.2 U
Chloroform	NE	0.2 U	0.2 U	0.2 U
Chloromethane	NE	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene	NE	0.2 U	0.2 U	0.2 U
cis-1,3-Dichloropropene	NE	0.2 U	0.2 U	0.2 U
Dibromochloromethane	0.5	0.2 U	0.2 U	0.2 U
Dibromomethane	NE	0.2 U	0.2 U	0.2 U
Ethylbenzene	700	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	NE	0.5 U	0.5 U	0.5 U
Iodomethane	NE	1.0 U	1.0 U	1.0 U
Isopropylbenzene	NE	0.2 U	0.2 U	0.2 U
m,p-Xylene	1,000	0.4 U	0.4 U	0.4 U
Methylene Chloride	NE	1.0 U	1.0 U	1.0 U
Naphthalene	160	0.5 U	0.5 U	0.5 U
n-Butylbenzene	NE	0.2 U	0.2 U	0.2 U
n-Propylbenzene	NE	0.2 U	0.2 U	0.2 U
o-Xylene	1,000	0.2 U	0.2 U	0.2 U
sec-Butylbenzene	NE	0.2 U	0.2 U	0.2 U
Styrene	NE	0.2 U	0.2 U	0.2 U
tert-Butylbenzene	NE	0.2 U	0.2 U	0.2 U
Tetrachloroethene	NE	0.2 U	0.2 U	0.2 U
Toluene	1000	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethene	NE	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene	NE	0.2 U	0.2 U	0.2 U
trans-1,4-Dichloro-2-butene	NE	1.0 U	1.0 U	1.0 U
Trichloroethene	NE	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane	NE	0.2 U	0.2 U	0.2 U
Vinyl Acetate	NE	0.2 U	0.2 U	0.2 U
Vinyl Chloride	NE	<b>16</b>	0.2 U	0.2 U
<b>Total Petroleum Hydrocarbons (mg/L)</b>				
Gasoline Range	800	0.10 U	0.10 U	0.10 U
Diesel range	500	<b>0.23</b>	<b>0.14</b>	0.10 U
Motor oil	500	0.20 U	0.20 U	0.26



TABLE A-2

**BOEING RENTON APRON A GROUNDWATER ANALYTICAL RESULTS<sup>1, 2</sup>**  
**FEBRUARY 5 AND 20, 2016**  
 Renton Airport - Boeing Apron A  
 Renton, Washington

	MTCA Cleanup Levels for Groundwater	Sample ID <sup>3</sup>		
		Apron-A- B-15- GW	Apron-A-B-16- GW	Apron-A-B-17- GW
<b>Constituent</b>				
<b>Total Metals (mg/L)</b>				
Aluminum	16	<b>245</b>	<b>41.2</b>	<b>147</b>
Arsenic	0.005	0.2 U	0.05 U	<b>0.06</b>
Barium	3.2	<b>1.29</b>	<b>0.242</b>	<b>0.738</b>
Cadmium	NE	0.01 U	0.002 U	0.002 U
Calcium	NE	<b>164</b>	<b>50.8</b>	<b>50.2</b>
Chromium	0.05	<b>0.45</b>	<b>0.078</b>	<b>0.303</b>
Cobalt	NE	<b>0.18</b>	<b>0.023</b>	<b>0.079</b>
Copper	0.64	<b>0.25</b>	<b>0.077</b>	<b>0.276</b>
Iron	NE	<b>579</b>	<b>56.1</b>	<b>188</b>
Lead	NE	0.1 U	0.02 U	<b>0.04</b>
Magnesium	NE	<b>102</b>	<b>20.8</b>	<b>50.3</b>
Molybdenum	0.08	0.02 U	<b>0.009</b>	<b>0.018</b>
Nickel	0.32	<b>0.41</b>	<b>0.08</b>	<b>0.29</b>
Silver	0.08	0.02 U	0.003 U	0.003 U
Zinc	4.8	<b>0.66</b>	<b>0.11</b>	<b>0.48</b>
<b>Dissolved Metals (mg/L)</b>				
Aluminum	16	0.05 U	NA	NA
Arsenic	0.005	0.05 U	NA	NA
Barium	3.2	<b>0.070</b>	NA	NA
Cadmium	NE	0.002 U	NA	NA
Calcium	NE	<b>65.8</b>	NA	NA
Chromium	0.05	0.005 U	NA	NA
Cobalt	NE	0.004	NA	NA
Copper	0.64	0.002 U	NA	NA
Iron	NE	<b>82.3</b>	NA	NA
Lead	NE	0.02 U	NA	NA
Magnesium	NE	<b>26.1</b>	NA	NA
Molybdenum	0.08	<b>0.011</b>	NA	NA
Nickel	0.32	0.01 U	NA	NA
Silver	0.08	0.003 U	NA	NA
Zinc	4.8	<b>0.02</b>	NA	NA

Notes

1. Data qualifiers are as follows:  
 U = The analyte was not detected at the reporting limit indicated.
2. **Bold Values** = detected above laboratory reporting limits.
3. Groundwater was not collected at Borings B-1 through B-14, B-19 and B-20.

Abbreviations

µg/L = micrograms per liter  
 mg/L = milligrams per liter  
 MTCA = Model Toxics Control Act  
 NA = not analyzed  
 NE = not evaluated.



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**APPENDIX B**

Laboratory Analytical Results



# Analytical Resources, Incorporated

Analytical Chemists and Consultants

September 25, 2015

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101



**RE: Project: Boeing Renton Apron A**  
**ARI Job: AMU3**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted fifteen soil/solid samples and a trip blank in good condition on September 18, 2015. Please see cooler receipt form for discrepancies.

The samples were analyzed for Total Metals, VOCs, PCBs, NWTPH-Dx and NWTPH-Gx, as requested on the COC.

The VOCs CCAL is out of control high for all associated FORM III "Q" flagged analytes. All associated samples that contain analyte have been flagged with a "Q" qualifier.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Kelly Bottem  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: AMU 3 Turn-around Requested: Standard Page: 1 of 2

ARI Client Company: AMEC Foster Wheeler Phone: 206-32-1760 Date: 9/19/15 Ice Present? YES

Client Contact: Crystal Thimssen No. of Coolers: 1 Cooler Temps: 4

Analytical Resources, Incorporated  
Analytical Chemists and Consultants  
4611 South 134th Place, Suite 100  
Tukwila, WA 98168  
206-695-6200 206-695-6201 (fax)  
www.arilabs.com



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					TOP G	SOIL	FOR	FOR	
APRON-A-B7	9/17/15	16:35	SOIL	6	X	X	X	X	Hold for 24 hours + 240 minutes
APRON-A-B7	↓	16:45	SOIL	2	X	X	X	X	Composite
APRON-A-B10	↓	17:10	SOIL	4	X	X	X	X	Composite
APRON-A-B10	↓	17:20	SOIL	2	X	X	X	X	Composite
APRON-A-CaulkA	9/18/15	8:05	Caulk	1	X	X	X	X	
APRON-A-CaulkB	↓	8:00	Caulk	1	X	X	X	X	
APRON-A-CaulkC	↓	8:10	Caulk	1	X	X	X	X	
APRON-A-B4	↓	10:15	SOIL	4	X	X	X	X	
APRON-A-B4	↓	10:20	SOIL	2	X	X	X	X	Composite
TRIP BLANK		-	Water	2					
Comments/Special Instructions <u>See the contract</u> <u>Nancy Swenson</u>					Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>WJ</u>				
*metals → Pb, As, Al, Cr, Cd, Cu, Fe, mg, Mn, Ni, P, Zn					Received by: (Signature) <u>[Signature]</u> Printed Name: <u>Emily Vitwin</u>				
					Company: <u>AMEC Foster Wheeler</u>				
					Date & Time: <u>9/18/15 1555</u>				
					Company: <u>ARI</u>				
					Date & Time: <u>9/18/16 1600</u>				

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: AM13 Turn-around Requested: Standard  
 ARI Client Company: AMEC Phone: 206-3421760  
 Client Contact: Crystal Thimsem  
 Client Project Name: Boeing Renton Apron A  
 Client Project #: SE1514560 Samplers: S Bellamy

Page: 2 of 2  
 Dates: 9/18/15 Ice Present? YRS  
 No. of Coolers: 1 Cooler Temps: 1.4

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested						Notes/Comments	
					TPH-G	VOCs	Total Solids	Field to SDCS + Trip Rate	PCBs	TPH-G		VOCs
Apron-A-B6	9/18/15	10:50	So.1	6	X	X	X	X	X			
Apron-A-B6	10:55	10:55	So.1	2	X	X	X	X	X			Compos. Yes
Apron-A-B5	11:45	11:45	So.1	6	X	X	X	X	X			Compos. Yes
Apron-A-B5	11:50	11:50	So.1	2	X	X	X	X	X			Compos. Yes
Apron-A wire coating	14:30	14:30	wire coating	1	X	X	X	X	X			
Apron-A-Blast Resealant	14:25	14:25	paint	1	X	X	X	X	X			
Comments/Special Instructions <u>see page 1</u>					Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>SEANIFFER BELBURY</u> Company: <u>AMEC Foster Wheeler</u> Date & Time: <u>9/18/15 15:55</u>					Received by: (Signature) <u>[Signature]</u> Printed Name: <u>EMILY LATVIN</u> Company: <u>ARI</u> Date & Time: <u>9/18/15 16:06</u>		

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

# Sample ID Cross Reference Report



ARI Job No: AMU3  
 Client: Boeing  
 Project Event: SE1516150  
 Project Name: Boeing Renton Apron A

Sample ID	ARI		Matrix	Sample Date/Time	VTSR	
	Lab ID	LIMS ID				
1. Apron-A-B7	AMU3A	15-16836	Soil	09/17/15 16:35	09/18/15	15:55
2. Apron-A-B7	AMU3B	15-16837	Soil	09/17/15 16:45	09/18/15	15:55
3. Apron-A-B10	AMU3C	15-16838	Soil	09/17/15 17:10	09/18/15	15:55
4. Apron-A-B10	AMU3D	15-16839	Soil	09/17/15 17:20	09/18/15	15:55
5. Apron-A-CaulkA	AMU3E	15-16840	solid	09/18/15 08:05	09/18/15	15:55
6. Apron-A-CaulkB	AMU3F	15-16841	solid	09/18/15 08:00	09/18/15	15:55
7. Apron-A-CaulkC	AMU3G	15-16842	Soil	09/18/15 08:10	09/18/15	15:55
8. Apron-A-B4	AMU3H	15-16843	Soil	09/18/15 10:15	09/18/15	15:55
9. Apron-A-B4	AMU3I	15-16844	Soil	09/18/15 10:20	09/18/15	15:55
10. Trip Blank	AMU3J	15-16845	Water	09/18/15 10:20	09/18/15	15:55
11. Apron-A-B6	AMU3K	15-16846	Soil	09/18/15 10:50	09/18/15	15:55
12. Apron-A-B6	AMU3L	15-16847	Soil	09/18/15 10:55	09/18/15	15:55
13. Apron-A-B5	AMU3M	15-16848	Soil	09/18/15 11:45	09/18/15	15:55
14. Apron-A-B5	AMU3N	15-16849	Soil	09/18/15 11:50	09/18/15	15:55
15. Apron-A-wire coating	AMU3O	15-16850	solid	09/18/15 14:30	09/18/15	15:55
16. Apron-A-Blast fence pain	AMU3P	15-16851	solid	09/18/15 14:25	09/18/15	15:55
17. Apron-A-B7	AMU3Q	15-16852	Soil	09/17/15 16:35	09/18/15	15:55
18. Apron-A-B10	AMU3R	15-16853	Soil	09/17/15 17:10	09/18/15	15:55
19. Apron-A-B4	AMU3S	15-16854	Soil	09/18/15 10:15	09/18/15	15:55
20. Apron-A-B6	AMU3T	15-16855	Soil	09/18/15 10:50	09/18/15	15:55
21. Apron-A-B5	AMU3U	15-16856	Soil	09/18/15 11:45	09/18/15	15:55



# Cooler Receipt Form

ARI Client: AMEC FW

Project Name: Boeing Renton Apron A

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: AMU3

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES  NO

Were custody papers included with the cooler? YES  NO

Were custody papers properly filled out (ink, signed, etc.) YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) \_\_\_\_\_

Time: 17

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# DC025608

Cooler Accepted by: ul Date: 9/18/19 Time: 1955

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES  NO

What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? NA  YES  NO

Were all bottles sealed in individual plastic bags? YES  NO

Did all bottles arrive in good condition (unbroken)? YES  NO

Were all bottle labels complete and legible? YES  NO

Did the number of containers listed on COC match with the number of containers received? YES  NO

Did all bottle labels and tags agree with custody papers? YES  NO

Were all bottles used correct for the requested analyses? YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA  YES  NO

Were all VOC vials free of air bubbles? NA  YES  NO

Was sufficient amount of sample sent in each bottle? YES  NO

Date VOC Trip Blank was made at ARI: NA 9/16/19

Was Sample Split by ARI:  YES  Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: ul Date: 9/18/19 Time: 938

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Small Air Bubbles</b> ~ 2mm 	<b>Peabubbles'</b> 2-4 mm 	<b>LARGE Air Bubbles</b> > 4 mm 
---------------------------------------	----------------------------------	--

- Small → "sm" (< 2 mm)
- Peabubbles → "pb" (2 to < 4 mm)
- Large → "lg" (4 to < 6 mm)
- Headspace → "hs" (> 6 mm)

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B7  
SAMPLE

Lab Sample ID: AMU3Q

QC Report No: AMU3-Boeing

LIMS ID: 15-16852

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized:

Date Sampled: 09/17/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT5/PAB

Sample Amount: 3.36 g-dry-wt

Date Analyzed: 09/22/15 18:09

Purge Volume: 5.0 mL

Moisture: 33.5%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.5	< 1.5	U
74-83-9	Bromomethane	1.5	< 1.5	U
75-01-4	Vinyl Chloride	1.5	< 1.5	U
75-00-3	Chloroethane	1.5	< 1.5	U
75-09-2	Methylene Chloride	3.0	< 3.0	U
<b>67-64-1</b>	<b>Acetone</b>	<b>7.4</b>	<b>25</b>	
75-15-0	Carbon Disulfide	1.5	< 1.5	U
75-35-4	1,1-Dichloroethene	1.5	< 1.5	U
75-34-3	1,1-Dichloroethane	1.5	< 1.5	U
156-60-5	trans-1,2-Dichloroethene	1.5	< 1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	< 1.5	U
67-66-3	Chloroform	1.5	< 1.5	U
107-06-2	1,2-Dichloroethane	1.5	< 1.5	U
78-93-3	2-Butanone	7.4	< 7.4	U
71-55-6	1,1,1-Trichloroethane	1.5	< 1.5	U
56-23-5	Carbon Tetrachloride	1.5	< 1.5	U
108-05-4	Vinyl Acetate	7.4	< 7.4	U
75-27-4	Bromodichloromethane	1.5	< 1.5	U
78-87-5	1,2-Dichloropropane	1.5	< 1.5	U
10061-01-5	cis-1,3-Dichloropropene	1.5	< 1.5	U
79-01-6	Trichloroethene	1.5	< 1.5	U
124-48-1	Dibromochloromethane	1.5	< 1.5	U
79-00-5	1,1,2-Trichloroethane	1.5	< 1.5	U
71-43-2	Benzene	1.5	< 1.5	U
10061-02-6	trans-1,3-Dichloropropene	1.5	< 1.5	U
110-75-8	2-Chloroethylvinylether	7.4	< 7.4	U
75-25-2	Bromoform	1.5	< 1.5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.4	< 7.4	U
591-78-6	2-Hexanone	7.4	< 7.4	U
127-18-4	Tetrachloroethene	1.5	< 1.5	U
79-34-5	1,1,2,2-Tetrachloroethane	1.5	< 1.5	U
108-88-3	Toluene	1.5	< 1.5	U
108-90-7	Chlorobenzene	1.5	< 1.5	U
100-41-4	Ethylbenzene	1.5	< 1.5	U
100-42-5	Styrene	1.5	< 1.5	U
75-69-4	Trichlorofluoromethane	1.5	< 1.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.0	< 3.0	U
179601-23-1	m,p-Xylene	1.5	< 1.5	U
95-47-6	o-Xylene	1.5	< 1.5	U
95-50-1	1,2-Dichlorobenzene	1.5	< 1.5	U
541-73-1	1,3-Dichlorobenzene	1.5	< 1.5	U
106-46-7	1,4-Dichlorobenzene	1.5	< 1.5	U
107-02-8	Acrolein	7.4	< 7.4	U
74-88-4	Iodomethane	1.5	< 1.5	U
74-96-4	Bromoethane	3.0	< 3.0	U
107-13-1	Acrylonitrile	7.4	< 7.4	U
563-58-6	1,1-Dichloropropene	1.5	< 1.5	U
74-95-3	Dibromomethane	1.5	< 1.5	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	< 1.5	U
96-12-8	1,2-Dibromo-3-chloropropane	7.4	< 7.4	U
96-18-4	1,2,3-Trichloropropane	3.0	< 3.0	U
110-57-6	trans-1,4-Dichloro-2-butene	7.4	< 7.4	U
108-67-8	1,3,5-Trimethylbenzene	1.5	< 1.5	U

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 2 of 2

Sample ID: Apron-A-B7  
SAMPLE

Lab Sample ID: AMU3Q

QC Report No: AMU3-Boeing

LIMS ID: 15-16852

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Date Analyzed: 09/22/15 18:09

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.5	< 1.5	U
87-68-3	Hexachlorobutadiene	7.4	< 7.4	U
106-93-4	1,2-Dibromoethane	1.5	< 1.5	U
74-97-5	Bromochloromethane	1.5	< 1.5	U
594-20-7	2,2-Dichloropropane	1.5	< 1.5	U
142-28-9	1,3-Dichloropropane	1.5	< 1.5	U
98-82-8	Isopropylbenzene	1.5	< 1.5	U
103-65-1	n-Propylbenzene	1.5	< 1.5	U
108-86-1	Bromobenzene	1.5	< 1.5	U
95-49-8	2-Chlorotoluene	1.5	< 1.5	U
106-43-4	4-Chlorotoluene	1.5	< 1.5	U
98-06-6	tert-Butylbenzene	1.5	< 1.5	U
135-98-8	sec-Butylbenzene	1.5	< 1.5	U
99-87-6	4-Isopropyltoluene	1.5	< 1.5	U
104-51-8	n-Butylbenzene	1.5	< 1.5	U
120-82-1	1,2,4-Trichlorobenzene	7.4	< 7.4	U
91-20-3	Naphthalene	7.4	< 7.4	U
87-61-6	1,2,3-Trichlorobenzene	7.4	< 7.4	U
107-87-9	2-Pentanone	7.4	< 7.4	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	107%
d8-Toluene	99.5%
Bromofluorobenzene	98.6%
d4-1,2-Dichlorobenzene	103%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B10  
SAMPLE

Lab Sample ID: AMU3R  
LIMS ID: 15-16853  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/17/15  
Date Received: 09/18/15

Instrument/Analyst: NT5/PAB  
Date Analyzed: 09/22/15 18:35

Sample Amount: 3.27 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 26.0%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.5	< 1.5	U
74-83-9	Bromomethane	1.5	< 1.5	U
75-01-4	Vinyl Chloride	1.5	< 1.5	U
75-00-3	Chloroethane	1.5	< 1.5	U
75-09-2	Methylene Chloride	3.1	< 3.1	U
<b>67-64-1</b>	<b>Acetone</b>	<b>7.6</b>	<b>49</b>	
75-15-0	Carbon Disulfide	1.5	< 1.5	U
75-35-4	1,1-Dichloroethene	1.5	< 1.5	U
75-34-3	1,1-Dichloroethane	1.5	< 1.5	U
156-60-5	trans-1,2-Dichloroethene	1.5	< 1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	< 1.5	U
67-66-3	Chloroform	1.5	< 1.5	U
107-06-2	1,2-Dichloroethane	1.5	< 1.5	U
78-93-3	2-Butanone	7.6	< 7.6	U
71-55-6	1,1,1-Trichloroethane	1.5	< 1.5	U
56-23-5	Carbon Tetrachloride	1.5	< 1.5	U
108-05-4	Vinyl Acetate	7.6	< 7.6	U
75-27-4	Bromodichloromethane	1.5	< 1.5	U
78-87-5	1,2-Dichloropropane	1.5	< 1.5	U
10061-01-5	cis-1,3-Dichloropropene	1.5	< 1.5	U
79-01-6	Trichloroethene	1.5	< 1.5	U
124-48-1	Dibromochloromethane	1.5	< 1.5	U
79-00-5	1,1,2-Trichloroethane	1.5	< 1.5	U
71-43-2	Benzene	1.5	< 1.5	U
10061-02-6	trans-1,3-Dichloropropene	1.5	< 1.5	U
110-75-8	2-Chloroethylvinylether	7.6	< 7.6	U
75-25-2	Bromoform	1.5	< 1.5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.6	< 7.6	U
591-78-6	2-Hexanone	7.6	< 7.6	U
127-18-4	Tetrachloroethene	1.5	< 1.5	U
79-34-5	1,1,2,2-Tetrachloroethane	1.5	< 1.5	U
108-88-3	Toluene	1.5	< 1.5	U
108-90-7	Chlorobenzene	1.5	< 1.5	U
100-41-4	Ethylbenzene	1.5	< 1.5	U
100-42-5	Styrene	1.5	< 1.5	U
75-69-4	Trichlorofluoromethane	1.5	< 1.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	< 3.1	U
179601-23-1	m,p-Xylene	1.5	< 1.5	U
95-47-6	o-Xylene	1.5	< 1.5	U
95-50-1	1,2-Dichlorobenzene	1.5	< 1.5	U
541-73-1	1,3-Dichlorobenzene	1.5	< 1.5	U
106-46-7	1,4-Dichlorobenzene	1.5	< 1.5	U
107-02-8	Acrolein	76	< 76	U
74-88-4	Iodomethane	1.5	< 1.5	U
74-96-4	Bromoethane	3.1	< 3.1	U
107-13-1	Acrylonitrile	7.6	< 7.6	U
563-58-6	1,1-Dichloropropene	1.5	< 1.5	U
74-95-3	Dibromomethane	1.5	< 1.5	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	< 1.5	U
96-12-8	1,2-Dibromo-3-chloropropane	7.6	< 7.6	U
96-18-4	1,2,3-Trichloropropane	3.1	< 3.1	U
110-57-6	trans-1,4-Dichloro-2-butene	7.6	< 7.6	U
108-67-8	1,3,5-Trimethylbenzene	1.5	< 1.5	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C  
 Page 2 of 2

Sample ID: Apron-A-B10  
 SAMPLE



Lab Sample ID: AMU3R

QC Report No: AMU3-Boeing

LIMS ID: 15-16853

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Date Analyzed: 09/22/15 18:35

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.5	< 1.5	U
87-68-3	Hexachlorobutadiene	7.6	< 7.6	U
106-93-4	1,2-Dibromoethane	1.5	< 1.5	U
74-97-5	Bromochloromethane	1.5	< 1.5	U
594-20-7	2,2-Dichloropropane	1.5	< 1.5	U
142-28-9	1,3-Dichloropropane	1.5	< 1.5	U
98-82-8	Isopropylbenzene	1.5	< 1.5	U
103-65-1	n-Propylbenzene	1.5	< 1.5	U
108-86-1	Bromobenzene	1.5	< 1.5	U
95-49-8	2-Chlorotoluene	1.5	< 1.5	U
106-43-4	4-Chlorotoluene	1.5	< 1.5	U
98-06-6	tert-Butylbenzene	1.5	< 1.5	U
135-98-8	sec-Butylbenzene	1.5	< 1.5	U
99-87-6	4-Isopropyltoluene	1.5	< 1.5	U
104-51-8	n-Butylbenzene	1.5	< 1.5	U
120-82-1	1,2,4-Trichlorobenzene	7.6	< 7.6	U
91-20-3	Naphthalene	7.6	< 7.6	U
87-61-6	1,2,3-Trichlorobenzene	7.6	< 7.6	U
107-87-9	2-Pentanone	7.6	< 7.6	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	107%
d8-Toluene	98.9%
Bromofluorobenzene	95.6%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B4  
SAMPLE

Lab Sample ID: AMU3S

QC Report No: AMU3-Boeing

LIMS ID: 15-16854

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized: *[Signature]*

Date Sampled: 09/18/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT5/PAB

Sample Amount: 2.74 g-dry-wt

Date Analyzed: 09/22/15 19:00

Purge Volume: 5.0 mL

Moisture: 33.9%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.8	< 1.8	U
74-83-9	Bromomethane	1.8	< 1.8	U
75-01-4	Vinyl Chloride	1.8	< 1.8	U
75-00-3	Chloroethane	1.8	< 1.8	U
75-09-2	Methylene Chloride	3.6	< 3.6	U
<b>67-64-1</b>	<b>Acetone</b>	<b>9.1</b>	<b>56</b>	
75-15-0	Carbon Disulfide	1.8	< 1.8	U
75-35-4	1,1-Dichloroethene	1.8	< 1.8	U
75-34-3	1,1-Dichloroethane	1.8	< 1.8	U
156-60-5	trans-1,2-Dichloroethene	1.8	< 1.8	U
156-59-2	cis-1,2-Dichloroethene	1.8	< 1.8	U
67-66-3	Chloroform	1.8	< 1.8	U
107-06-2	1,2-Dichloroethane	1.8	< 1.8	U
78-93-3	2-Butanone	9.1	< 9.1	U
71-55-6	1,1,1-Trichloroethane	1.8	< 1.8	U
56-23-5	Carbon Tetrachloride	1.8	< 1.8	U
108-05-4	Vinyl Acetate	9.1	< 9.1	U
75-27-4	Bromodichloromethane	1.8	< 1.8	U
78-87-5	1,2-Dichloropropane	1.8	< 1.8	U
10061-01-5	cis-1,3-Dichloropropene	1.8	< 1.8	U
79-01-6	Trichloroethene	1.8	< 1.8	U
124-48-1	Dibromochloromethane	1.8	< 1.8	U
79-00-5	1,1,2-Trichloroethane	1.8	< 1.8	U
71-43-2	Benzene	1.8	< 1.8	U
10061-02-6	trans-1,3-Dichloropropene	1.8	< 1.8	U
110-75-8	2-Chloroethylvinylether	9.1	< 9.1	U
75-25-2	Bromoform	1.8	< 1.8	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	9.1	< 9.1	U
591-78-6	2-Hexanone	9.1	< 9.1	U
127-18-4	Tetrachloroethene	1.8	< 1.8	U
79-34-5	1,1,2,2-Tetrachloroethane	1.8	< 1.8	U
108-88-3	Toluene	1.8	< 1.8	U
108-90-7	Chlorobenzene	1.8	< 1.8	U
100-41-4	Ethylbenzene	1.8	< 1.8	U
100-42-5	Styrene	1.8	< 1.8	U
75-69-4	Trichlorofluoromethane	1.8	< 1.8	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.6	< 3.6	U
179601-23-1	m,p-Xylene	1.8	< 1.8	U
95-47-6	o-Xylene	1.8	< 1.8	U
95-50-1	1,2-Dichlorobenzene	1.8	< 1.8	U
541-73-1	1,3-Dichlorobenzene	1.8	< 1.8	U
106-46-7	1,4-Dichlorobenzene	1.8	< 1.8	U
107-02-8	Acrolein	91	< 91	U
74-88-4	Iodomethane	1.8	< 1.8	U
74-96-4	Bromoethane	3.6	< 3.6	U
107-13-1	Acrylonitrile	9.1	< 9.1	U
563-58-6	1,1-Dichloropropene	1.8	< 1.8	U
74-95-3	Dibromomethane	1.8	< 1.8	U
630-20-6	1,1,1,2-Tetrachloroethane	1.8	< 1.8	U
96-12-8	1,2-Dibromo-3-chloropropane	9.1	< 9.1	U
96-18-4	1,2,3-Trichloropropane	3.6	< 3.6	U
110-57-6	trans-1,4-Dichloro-2-butene	9.1	< 9.1	U
108-67-8	1,3,5-Trimethylbenzene	1.8	< 1.8	U

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
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Sample ID: Apron-A-B4  
SAMPLE

Lab Sample ID: AMU3S

QC Report No: AMU3-Boeing

LIMS ID: 15-16854

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Date Analyzed: 09/22/15 19:00

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.8	< 1.8	U
87-68-3	Hexachlorobutadiene	9.1	< 9.1	U
106-93-4	1,2-Dibromoethane	1.8	< 1.8	U
74-97-5	Bromochloromethane	1.8	< 1.8	U
594-20-7	2,2-Dichloropropane	1.8	< 1.8	U
142-28-9	1,3-Dichloropropane	1.8	< 1.8	U
98-82-8	Isopropylbenzene	1.8	< 1.8	U
103-65-1	n-Propylbenzene	1.8	< 1.8	U
108-86-1	Bromobenzene	1.8	< 1.8	U
95-49-8	2-Chlorotoluene	1.8	< 1.8	U
106-43-4	4-Chlorotoluene	1.8	< 1.8	U
98-06-6	tert-Butylbenzene	1.8	< 1.8	U
135-98-8	sec-Butylbenzene	1.8	< 1.8	U
99-87-6	4-Isopropyltoluene	1.8	< 1.8	U
104-51-8	n-Butylbenzene	1.8	< 1.8	U
120-82-1	1,2,4-Trichlorobenzene	9.1	< 9.1	U
91-20-3	Naphthalene	9.1	< 9.1	U
87-61-6	1,2,3-Trichlorobenzene	9.1	< 9.1	U
107-87-9	2-Pentanone	9.1	< 9.1	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	99.2%
d8-Toluene	99.2%
Bromofluorobenzene	92.5%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B6  
SAMPLE

Lab Sample ID: AMU3T

QC Report No: AMU3-Boeing

LIMS ID: 15-16855

Project: Boeing Renton Apron A  
SE1516150

Matrix: Soil

Data Release Authorized:

Date Sampled: 09/18/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT5/PAB

Sample Amount: 3.82 g-dry-wt

Date Analyzed: 09/22/15 19:26

Purge Volume: 5.0 mL

Moisture: 26.6%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.3	< 1.3	U
74-83-9	Bromomethane	1.3	< 1.3	U
75-01-4	Vinyl Chloride	1.3	< 1.3	U
75-00-3	Chloroethane	1.3	< 1.3	U
75-09-2	Methylene Chloride	2.6	< 2.6	U
<b>67-64-1</b>	<b>Acetone</b>	<b>6.5</b>	<b>24</b>	
75-15-0	Carbon Disulfide	1.3	< 1.3	U
75-35-4	1,1-Dichloroethene	1.3	< 1.3	U
75-34-3	1,1-Dichloroethane	1.3	< 1.3	U
156-60-5	trans-1,2-Dichloroethene	1.3	< 1.3	U
156-59-2	cis-1,2-Dichloroethene	1.3	< 1.3	U
67-66-3	Chloroform	1.3	< 1.3	U
107-06-2	1,2-Dichloroethane	1.3	< 1.3	U
78-93-3	2-Butanone	6.5	< 6.5	U
71-55-6	1,1,1-Trichloroethane	1.3	< 1.3	U
56-23-5	Carbon Tetrachloride	1.3	< 1.3	U
108-05-4	Vinyl Acetate	6.5	< 6.5	U
75-27-4	Bromodichloromethane	1.3	< 1.3	U
78-87-5	1,2-Dichloropropane	1.3	< 1.3	U
10061-01-5	cis-1,3-Dichloropropene	1.3	< 1.3	U
79-01-6	Trichloroethene	1.3	< 1.3	U
124-48-1	Dibromochloromethane	1.3	< 1.3	U
79-00-5	1,1,2-Trichloroethane	1.3	< 1.3	U
71-43-2	Benzene	1.3	< 1.3	U
10061-02-6	trans-1,3-Dichloropropene	1.3	< 1.3	U
110-75-8	2-Chloroethylvinylether	6.5	< 6.5	U
75-25-2	Bromoform	1.3	< 1.3	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.5	< 6.5	U
591-78-6	2-Hexanone	6.5	< 6.5	U
127-18-4	Tetrachloroethene	1.3	< 1.3	U
79-34-5	1,1,2,2-Tetrachloroethane	1.3	< 1.3	U
108-88-3	Toluene	1.3	< 1.3	U
108-90-7	Chlorobenzene	1.3	< 1.3	U
100-41-4	Ethylbenzene	1.3	< 1.3	U
100-42-5	Styrene	1.3	< 1.3	U
75-69-4	Trichlorofluoromethane	1.3	< 1.3	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.6	< 2.6	U
179601-23-1	m,p-Xylene	1.3	< 1.3	U
95-47-6	o-Xylene	1.3	< 1.3	U
95-50-1	1,2-Dichlorobenzene	1.3	< 1.3	U
541-73-1	1,3-Dichlorobenzene	1.3	< 1.3	U
106-46-7	1,4-Dichlorobenzene	1.3	< 1.3	U
107-02-8	Acrolein	65	< 65	U
74-88-4	Iodomethane	1.3	< 1.3	U
74-96-4	Bromoethane	2.6	< 2.6	U
107-13-1	Acrylonitrile	6.5	< 6.5	U
563-58-6	1,1-Dichloropropene	1.3	< 1.3	U
74-95-3	Dibromomethane	1.3	< 1.3	U
630-20-6	1,1,1,2-Tetrachloroethane	1.3	< 1.3	U
96-12-8	1,2-Dibromo-3-chloropropane	6.5	< 6.5	U
96-18-4	1,2,3-Trichloropropane	2.6	< 2.6	U
110-57-6	trans-1,4-Dichloro-2-butene	6.5	< 6.5	U
108-67-8	1,3,5-Trimethylbenzene	1.3	< 1.3	U

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
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Sample ID: Apron-A-B6  
SAMPLE

Lab Sample ID: AMU3T

QC Report No: AMU3-Boeing

LIMS ID: 15-16855

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Date Analyzed: 09/22/15 19:26

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.3	< 1.3	U
87-68-3	Hexachlorobutadiene	6.5	< 6.5	U
106-93-4	1,2-Dibromoethane	1.3	< 1.3	U
74-97-5	Bromochloromethane	1.3	< 1.3	U
594-20-7	2,2-Dichloropropane	1.3	< 1.3	U
142-28-9	1,3-Dichloropropane	1.3	< 1.3	U
98-82-8	Isopropylbenzene	1.3	< 1.3	U
103-65-1	n-Propylbenzene	1.3	< 1.3	U
108-86-1	Bromobenzene	1.3	< 1.3	U
95-49-8	2-Chlorotoluene	1.3	< 1.3	U
106-43-4	4-Chlorotoluene	1.3	< 1.3	U
98-06-6	tert-Butylbenzene	1.3	< 1.3	U
135-98-8	sec-Butylbenzene	1.3	< 1.3	U
99-87-6	4-Isopropyltoluene	1.3	< 1.3	U
104-51-8	n-Butylbenzene	1.3	< 1.3	U
120-82-1	1,2,4-Trichlorobenzene	6.5	< 6.5	U
91-20-3	Naphthalene	6.5	< 6.5	U
87-61-6	1,2,3-Trichlorobenzene	6.5	< 6.5	U
107-87-9	2-Pentanone	6.5	< 6.5	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	100%
d8-Toluene	99.5%
Bromofluorobenzene	95.8%
d4-1,2-Dichlorobenzene	103%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: Apron-A-B5

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SAMPLE

Lab Sample ID: AMU3U

QC Report No: AMU3-Boeing

LIMS ID: 15-16856

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized: *[Signature]*

Date Sampled: 09/18/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT5/PAB

Sample Amount: 3.66 g-dry-wt

Date Analyzed: 09/22/15 19:52

Purge Volume: 5.0 mL

Moisture: 26.5%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.4	< 1.4	U
74-83-9	Bromomethane	1.4	< 1.4	U
75-01-4	Vinyl Chloride	1.4	< 1.4	U
75-00-3	Chloroethane	1.4	< 1.4	U
75-09-2	Methylene Chloride	2.7	< 2.7	U
<b>67-64-1</b>	<b>Acetone</b>	<b>6.8</b>	<b>23</b>	
75-15-0	Carbon Disulfide	1.4	< 1.4	U
75-35-4	1,1-Dichloroethene	1.4	< 1.4	U
75-34-3	1,1-Dichloroethane	1.4	< 1.4	U
156-60-5	trans-1,2-Dichloroethene	1.4	< 1.4	U
156-59-2	cis-1,2-Dichloroethene	1.4	< 1.4	U
67-66-3	Chloroform	1.4	< 1.4	U
107-06-2	1,2-Dichloroethane	1.4	< 1.4	U
78-93-3	2-Butanone	6.8	< 6.8	U
71-55-6	1,1,1-Trichloroethane	1.4	< 1.4	U
56-23-5	Carbon Tetrachloride	1.4	< 1.4	U
108-05-4	Vinyl Acetate	6.8	< 6.8	U
75-27-4	Bromodichloromethane	1.4	< 1.4	U
78-87-5	1,2-Dichloropropane	1.4	< 1.4	U
10061-01-5	cis-1,3-Dichloropropene	1.4	< 1.4	U
79-01-6	Trichloroethene	1.4	< 1.4	U
124-48-1	Dibromochloromethane	1.4	< 1.4	U
79-00-5	1,1,2-Trichloroethane	1.4	< 1.4	U
71-43-2	Benzene	1.4	< 1.4	U
10061-02-6	trans-1,3-Dichloropropene	1.4	< 1.4	U
110-75-8	2-Chloroethylvinylether	6.8	< 6.8	U
75-25-2	Bromoform	1.4	< 1.4	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.8	< 6.8	U
591-78-6	2-Hexanone	6.8	< 6.8	U
127-18-4	Tetrachloroethene	1.4	< 1.4	U
79-34-5	1,1,2,2-Tetrachloroethane	1.4	< 1.4	U
108-88-3	Toluene	1.4	< 1.4	U
108-90-7	Chlorobenzene	1.4	< 1.4	U
100-41-4	Ethylbenzene	1.4	< 1.4	U
100-42-5	Styrene	1.4	< 1.4	U
75-69-4	Trichlorofluoromethane	1.4	< 1.4	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.7	< 2.7	U
179601-23-1	m,p-Xylene	1.4	< 1.4	U
95-47-6	o-Xylene	1.4	< 1.4	U
95-50-1	1,2-Dichlorobenzene	1.4	< 1.4	U
541-73-1	1,3-Dichlorobenzene	1.4	< 1.4	U
106-46-7	1,4-Dichlorobenzene	1.4	< 1.4	U
107-02-8	Acrolein	68	< 68	U
74-88-4	Iodomethane	1.4	< 1.4	U
74-96-4	Bromoethane	2.7	< 2.7	U
107-13-1	Acrylonitrile	6.8	< 6.8	U
563-58-6	1,1-Dichloropropene	1.4	< 1.4	U
74-95-3	Dibromomethane	1.4	< 1.4	U
630-20-6	1,1,1,2-Tetrachloroethane	1.4	< 1.4	U
96-12-8	1,2-Dibromo-3-chloropropane	6.8	< 6.8	U
96-18-4	1,2,3-Trichloropropane	2.7	< 2.7	U
110-57-6	trans-1,4-Dichloro-2-butene	6.8	< 6.8	U
108-67-8	1,3,5-Trimethylbenzene	1.4	< 1.4	U

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
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Sample ID: Apron-A-B5  
SAMPLE

Lab Sample ID: AMU3U

QC Report No: AMU3-Boeing

LIMS ID: 15-16856

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Date Analyzed: 09/22/15 19:52

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.4	< 1.4	U
87-68-3	Hexachlorobutadiene	6.8	< 6.8	U
106-93-4	1,2-Dibromoethane	1.4	< 1.4	U
74-97-5	Bromochloromethane	1.4	< 1.4	U
594-20-7	2,2-Dichloropropane	1.4	< 1.4	U
142-28-9	1,3-Dichloropropane	1.4	< 1.4	U
98-82-8	Isopropylbenzene	1.4	< 1.4	U
103-65-1	n-Propylbenzene	1.4	< 1.4	U
108-86-1	Bromobenzene	1.4	< 1.4	U
95-49-8	2-Chlorotoluene	1.4	< 1.4	U
106-43-4	4-Chlorotoluene	1.4	< 1.4	U
98-06-6	tert-Butylbenzene	1.4	< 1.4	U
135-98-8	sec-Butylbenzene	1.4	< 1.4	U
99-87-6	4-Isopropyltoluene	1.4	< 1.4	U
104-51-8	n-Butylbenzene	1.4	< 1.4	U
120-82-1	1,2,4-Trichlorobenzene	6.8	< 6.8	U
91-20-3	Naphthalene	6.8	< 6.8	U
87-61-6	1,2,3-Trichlorobenzene	6.8	< 6.8	U
107-87-9	2-Pentanone	6.8	< 6.8	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	104%
d8-Toluene	99.4%
Bromofluorobenzene	97.3%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Sample ID: MB-092215A

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METHOD BLANK

Lab Sample ID: MB-092215A


QC Report No: AMU3-Boeing

LIMS ID: 15-16852

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized: 

Date Sampled: NA

Reported: 09/24/15

Date Received: NA

Instrument/Analyst: NT5/PAB

Sample Amount: 5.00 g-dry-wt

Date Analyzed: 09/22/15 12:14

Purge Volume: 5.0 mL

Moisture: NA

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	50	< 50	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 2 of 2

Sample ID: MB-092215A  
METHOD BLANK

Lab Sample ID: MB-092215A  
LIMS ID: 15-16852  
Matrix: Soil  
Date Analyzed: 09/22/15 12:14

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U
107-87-9	2-Pentanone	5.0	< 5.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	95.9%
d8-Toluene	97.7%
Bromofluorobenzene	97.5%
d4-1,2-Dichlorobenzene	99.8%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Trip Blank  
SAMPLE

Lab Sample ID: AMU3J


QC Report No: AMU3-Boeing

LIMS ID: 15-16845

Project: Boeing Renton Apron A

Matrix: Water

SE1516150

Data Release Authorized: 

Date Sampled: 09/18/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT5/PAB

Sample Amount: 5.00 mL

Date Analyzed: 09/22/15 17:43

Purge Volume: 5.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	10	< 10	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C  
 Page 2 of 2

Sample ID: Trip Blank  
 SAMPLE



Lab Sample ID: AMU3J  
 LIMS ID: 15-16845  
 Matrix: Water  
 Date Analyzed: 09/22/15 17:43

QC Report No: AMU3-Boeing  
 Project: Boeing Renton Apron A  
 SE1516150

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	10	< 10	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	5.0	< 5.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U
107-87-9	2-Pentanone	5.0	< 5.0	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	98.4%
d8-Toluene	99.8%
Bromofluorobenzene	97.9%
d4-1,2-Dichlorobenzene	99.1%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AM03-Boeing  
 Project: Boeing Renton Apron A  
 SF1516150

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
AM03J	Trip Blank	5	98.4%	99.8%	97.9%	99.1%	0

LCS/MS LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane  
 (TOL) = d8-Toluene  
 (BFB) = Bromofluorobenzene  
 (DCB) = d4-1,2-Dichlorobenzene

80-149  
 77-120  
 80-120  
 80-120

80-125  
 80-120  
 80-120  
 80-120

Prep Method: SW5030B  
 Log Number Range: 15-16845 to 15-16845

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AMU3-Boeing  
 Project: Boeing Renton Apron A  
 SE1516150

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-092215A	Method Blank	Low	95.9%	97.7%	97.5%	99.8%	0
LCS-092215A	Lab Control	Low	97.8%	101%	99.6%	98.3%	0
LCSD-092215A	Lab Control Dup	Low	96.1%	101%	98.7%	99.7%	0
AMU3Q	Apron-A-B7	Low	107%	99.5%	98.6%	103%	0
AMU3R	Apron-A-B10	Low	107%	98.9%	95.6%	101%	0
AMU3S	Apron-A-B4	Low	99.2%	99.2%	92.5%	101%	0
AMU3T	Apron-A-B6	Low	100%	99.5%	95.8%	103%	0
AMU3U	Apron-A-B5	Low	104%	99.4%	97.3%	101%	0

LCS/MB LIMITS

QC LIMITS


	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	80-149	80-124
(TOL) = d8-Toluene	77-120	80-120	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 15-16843 to 15-16856

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: LCS-092215A  
LAB CONTROL SAMPLE

Lab Sample ID: LCS-092215A  
LIMS ID: 15-16852  
Matrix: Soil  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: NA  
Date Received: NA

Instrument/Analyst LCS: NT5/PAB  
LCSID: NT5/PAB  
Date Analyzed LCS: 09/22/15 11:23  
LCSID: 09/22/15 11:48

Sample Amount LCS: 5.00 g-dry-wt  
LCSID: 5.00 g-dry-wt  
Purge Volume LCS: 5.0 mL  
LCSID: 5.0 mL  
Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSID	Spike Added-LCSID	LCSID Recovery	RPD
Chloromethane	43.0	50.0	86.0%	45.2	50.0	90.4%	5.0%
Bromomethane	41.1	50.0	82.2%	44.2	50.0	88.4%	7.3%
Vinyl Chloride	43.7	50.0	87.4%	45.8	50.0	91.6%	4.7%
Chloroethane	41.8	50.0	83.6%	44.3	50.0	88.6%	5.8%
Methylene Chloride	42.6	50.0	85.2%	45.7	50.0	91.4%	7.0%
Acetone	214	250	85.6%	219	250	87.6%	2.3%
Carbon Disulfide	45.2	50.0	90.4%	48.7	50.0	97.4%	7.5%
1,1-Dichloroethene	45.2	50.0	90.4%	47.4	50.0	94.8%	4.8%
1,1-Dichloroethane	43.8	50.0	87.6%	48.0	50.0	96.0%	9.2%
trans-1,2-Dichloroethene	43.5	50.0	87.0%	46.9	50.0	93.8%	7.5%
cis-1,2-Dichloroethene	43.2	50.0	86.4%	46.1	50.0	92.2%	6.5%
Chloroform	43.9	50.0	87.8%	47.1	50.0	94.2%	7.0%
1,2-Dichloroethane	44.3	50.0	88.6%	45.5	50.0	91.0%	2.7%
2-Butanone	243	250	97.2%	240	250	96.0%	1.2%
1,1,1-Trichloroethane	43.1	50.0	86.2%	47.3	50.0	94.6%	9.3%
Carbon Tetrachloride	44.3	50.0	88.6%	50.0	50.0	100%	12.1%
Vinyl Acetate	47.1	50.0	94.2%	46.9	50.0	93.8%	0.4%
Bromodichloromethane	45.5	50.0	91.0%	48.0	50.0	96.0%	5.3%
1,2-Dichloropropane	44.2	50.0	88.4%	47.2	50.0	94.4%	6.6%
cis-1,3-Dichloropropene	44.7	50.0	89.4%	47.0	50.0	94.0%	5.0%
Trichloroethene	43.0	50.0	86.0%	47.3	50.0	94.6%	9.5%
Dibromochloromethane	46.2	50.0	92.4%	48.2	50.0	96.4%	4.2%
1,1,2-Trichloroethane	43.5	50.0	87.0%	45.4	50.0	90.8%	4.3%
Benzene	42.7	50.0	85.4%	47.8	50.0	95.6%	11.3%
trans-1,3-Dichloropropene	46.4	50.0	92.8%	48.0	50.0	96.0%	3.4%
2-Chloroethylvinylether	46.7	50.0	93.4%	53.1	50.0	106%	12.8%
Bromoform	45.9	50.0	91.8%	51.8	50.0	104%	12.1%
4-Methyl-2-Pentanone (MIBK)	238	250	95.2%	242	250	96.8%	1.7%
2-Hexanone	249	250	99.6%	260	250	104%	4.3%
Tetrachloroethene	44.6	50.0	89.2%	50.6	50.0	101%	12.6%
1,1,2,2-Tetrachloroethane	46.7	50.0	93.4%	49.3	50.0	98.6%	5.4%
Toluene	40.8	50.0	81.6%	43.9	50.0	87.8%	7.3%
Chlorobenzene	43.5	50.0	87.0%	47.4	50.0	94.8%	8.6%
Ethylbenzene	43.4	50.0	86.8%	49.0	50.0	98.0%	12.1%
Styrene	44.2	50.0	88.4%	49.6	50.0	99.2%	11.5%
Trichlorofluoromethane	61.7 Q	50.0	123%	61.6 Q	50.0	123%	0.2%
1,1,2-Trichloro-1,2,2-trifluoroethane	44.8	50.0	89.6%	48.5	50.0	97.0%	7.9%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C

Page 2 of 2

Sample ID: LCS-092215A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-092215A

LIMS ID: 15-16852

Matrix: Soil

QC Report No: AMU3-Boeing

Project: Boeing Renton Apron A

SE1516150

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
m,p-Xylene	87.3	100	87.3%	97.5	100	97.5%	11.0%
o-Xylene	43.2	50.0	86.4%	47.8	50.0	95.6%	10.1%
1,2-Dichlorobenzene	43.9	50.0	87.8%	48.7	50.0	97.4%	10.4%
1,3-Dichlorobenzene	43.9	50.0	87.8%	49.7	50.0	99.4%	12.4%
1,4-Dichlorobenzene	44.3	50.0	88.6%	49.2	50.0	98.4%	10.5%
Acrolein	261	250	104%	265	250	106%	1.5%
Iodomethane	44.6	50.0	89.2%	51.0	50.0	102%	13.4%
Bromoethane	43.2	50.0	86.4%	46.7	50.0	93.4%	7.8%
Acrylonitrile	48.2	50.0	96.4%	47.2	50.0	94.4%	2.1%
1,1-Dichloropropene	43.1	50.0	86.2%	48.1	50.0	96.2%	11.0%
Dibromomethane	43.9	50.0	87.8%	45.8	50.0	91.6%	4.2%
1,1,1,2-Tetrachloroethane	43.6	50.0	87.2%	48.2	50.0	96.4%	10.0%
1,2-Dibromo-3-chloropropane	47.8	50.0	95.6%	50.4	50.0	101%	5.3%
1,2,3-Trichloropropane	45.8	50.0	91.6%	50.9	50.0	102%	10.5%
trans-1,4-Dichloro-2-butene	45.4	50.0	90.8%	48.8	50.0	97.6%	7.2%
1,3,5-Trimethylbenzene	43.4	50.0	86.8%	50.2	50.0	100%	14.5%
1,2,4-Trimethylbenzene	44.2	50.0	88.4%	50.3	50.0	101%	12.9%
Hexachlorobutadiene	40.7	50.0	81.4%	49.3	50.0	98.6%	19.1%
1,2-Dibromoethane	47.0	50.0	94.0%	46.7	50.0	93.4%	0.6%
Bromochloromethane	44.7	50.0	89.4%	45.1	50.0	90.2%	0.9%
2,2-Dichloropropane	45.2	50.0	90.4%	48.3	50.0	96.6%	6.6%
1,3-Dichloropropane	44.9	50.0	89.8%	48.1	50.0	96.2%	6.9%
Isopropylbenzene	43.3	50.0	86.6%	50.4	50.0	101%	15.2%
n-Propylbenzene	44.8	50.0	89.6%	51.8	50.0	104%	14.5%
Bromobenzene	44.0	50.0	88.0%	48.1	50.0	96.2%	8.9%
2-Chlorotoluene	43.2	50.0	86.4%	49.6	50.0	99.2%	13.8%
4-Chlorotoluene	45.0	50.0	90.0%	51.0	50.0	102%	12.5%
tert-Butylbenzene	43.1	50.0	86.2%	50.5	50.0	101%	15.8%
sec-Butylbenzene	44.4	50.0	88.8%	51.7	50.0	103%	15.2%
4-Isopropyltoluene	45.2	50.0	90.4%	52.4	50.0	105%	14.8%
n-Butylbenzene	46.0	50.0	92.0%	52.4	50.0	105%	13.0%
1,2,4-Trichlorobenzene	47.6	50.0	95.2%	51.5	50.0	103%	7.9%
Naphthalene	47.1	50.0	94.2%	50.6	50.0	101%	7.2%
1,2,3-Trichlorobenzene	46.7	50.0	93.4%	49.7	50.0	99.4%	6.2%
2-Pentanone	238	250	95.2%	243	250	97.2%	2.1%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d4-1,2-Dichloroethane	97.8%	96.1%
d8-Toluene	101%	101%
Bromofluorobenzene	99.6%	98.7%
d4-1,2-Dichlorobenzene	98.3%	99.7%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: Apron-A-B7  
SAMPLE

Lab Sample ID: AMU3A

LIMS ID: 15-16836

Matrix: Soil

Data Release Authorized:

Reported: 09/24/15

QC Report No: AMU3-Boeing

Project: Boeing Renton Apron A

SE1516150

Date Sampled: 09/17/15

Date Received: 09/18/15

Instrument/Analyst: NT3/LH

Date Analyzed: 09/23/15 16:25

Sample Amount: 85.6 mg-dry-wt

Purge Volume: 10.0 mL

Moisture: 33.5%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	12	16		GRO

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	99.5%
Bromofluorobenzene	93.2%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: Apron-A-B10  
SAMPLE

Lab Sample ID: AMU3C

QC Report No: AMU3-Boeing

LIMS ID: 15-16838

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized: *AB*

Date Sampled: 09/17/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT3/LH

Sample Amount: 98.0 mg-dry-wt

Date Analyzed: 09/23/15 16:51

Purge Volume: 10.0 mL

Moisture: 26.0%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	10	< 10	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	98.1%
Bromofluorobenzene	90.6%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: Apron-A-B4  
SAMPLE

Lab Sample ID: AMU3H


QC Report No: AMU3-Boeing

LIMS ID: 15-16843

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized: 

Date Sampled: 09/18/15

Reported: 09/24/15

Date Received: 09/18/15

Instrument/Analyst: NT3/LH

Sample Amount: 88.1 mg-dry-wt

Date Analyzed: 09/23/15 17:16

Purge Volume: 10.0 mL

Moisture: 33.9%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	11	< 11	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**


d8-Toluene	99.1%
Bromofluorobenzene	93.8%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS--Method SW8260C  
Page 1 of 1

Sample ID: Apron-A-B6  
SAMPLE

Lab Sample ID: AMU3K  
LIMS ID: 15-16846  
Matrix: Soil  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Instrument/Analyst: NT3/LH  
Date Analyzed: 09/23/15 17:42

Sample Amount: 112 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: 26.6%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	9.0	< 9.0	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**


d8-Toluene	98.7%
Bromofluorobenzene	93.3%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS--Method SW8260C  
Page 1 of 1

Sample ID: Apron-A-B5  
SAMPLE

Lab Sample ID: AMU3M  
LIMS ID: 15-16848  
Matrix: Soil  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Instrument/Analyst: NT3/LH  
Date Analyzed: 09/23/15 18:07

Sample Amount: 115 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: 26.5%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	8.7	< 8.7	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	99.3%
Bromofluorobenzene	92.6%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C  
Page 1 of 1

Sample ID: MB-092315A  
METHOD BLANK

Lab Sample ID: MB-092315A  
LIMS ID: 15-16838  
Matrix: Soil  
Data Release Authorized: *AS*  
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: NA  
Date Received: NA

Instrument/Analyst: NT3/LH  
Date Analyzed: 09/23/15 14:42

Sample Amount: 200 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: NA

CAS Number	Analyte	LOQ	Result	Q
86290-81-5	Gasoline Range Hydrocarbons	5.0	< 5.0	U

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	97.9%
Bromofluorobenzene	94.4%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AMU3-Boeing  
 Project: Boeing Renton Apron A  
 SE1516150

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
AMU3A	Apron-A-B7	Med	NA	99.5%	93.2%	NA	0
MB-092315A	Method Blank	Med	NA	97.9%	94.4%	NA	0
LCS-092315A	Lab Control	Med	NA	99.4%	91.3%	NA	0
LCSD-092315A	Lab Control Dup	Med	NA	99.1%	93.0%	NA	0
AMU3C	Apron-A-B10	Med	NA	98.1%	90.6%	NA	0
AMU3H	Apron-A-B4	Med	NA	99.1%	93.8%	NA	0
AMU3K	Apron-A-B6	Med	NA	98.7%	93.3%	NA	0
AMU3M	Apron-A-B5	Med	NA	99.3%	92.6%	NA	0

LCS/MB LIMITS

QC LIMITS

	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	80-149	80-124
(TOL) = d8-Toluene	77-120	80-120	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 15-16836 to 15-16848

**ORGANICS ANALYSIS DATA SHEET**  
**Volatiles by Purge & Trap GC/MS**  
 Page 1 of 1

Sample ID: LCS-092315A  
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-092315A  
 LIMS ID: 15-16838  
 Matrix: Soil  
 Data Release Authorized: *RS*  
 Reported: 09/24/15

QC Report No: AMU3-Boeing  
 Project: Boeing Renton Apron A  
 SE1516150  
 Date Sampled: NA  
 Date Received: NA

Instrument/Analyst LCS: NT3/LH  
 LCSD: NT3/LH  
 Date Analyzed LCS: 09/23/15 15:08  
 LCSD: 09/23/15 15:34

Sample Amount LCS: 200 mg-dry-wt  
 LCSD: 200 mg-dry-wt  
 Purge Volume LCS: 10.0 mL  
 LCSD: 10.0 mL  
 Moisture: NA

Analyte	LCS	Spike	LCS	LCS	LCS	Spike	LCSD	RPD
		Added-LCS	Recovery			Added-LCSD	Recovery	
Gasoline Range Hydrocarbons	40.0	50.0	90.0%	38.0	50.0	76.0%	5.1%	

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d8-Toluene	99.4%	99.1%
Bromofluorobenzene	91.3%	93.0%


**ORGANICS ANALYSIS DATA SHEET  
TOTAL DIESEL RANGE HYDROCARBONS**

NWTPHD by GC/FID  
Extraction Method: SW3546  
Page 1 of 1

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150

Matrix: Soil

Date Received: 09/18/15

Data Release Authorized:   
Reported: 09/23/15

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	LOQ	Result
AMU3B 15-16837	Apron-A-B7 HC ID: DIESEL/MOTOR OIL	09/22/15	09/22/15	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	8.2 16	25 120 64.1%
AMU3D 15-16839	Apron-A-B10 HC ID: DIESEL/MOTOR OIL	09/22/15	09/22/15	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	7.5 15	9.6 48 72.6%
AMU3I 15-16844	Apron-A-B4 HC ID: DIESEL/MOTOR OIL	09/22/15	09/22/15	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	7.3 15	12 58 72.4%
AMU3L 15-16847	Apron-A-B6 HC ID: MOTOR OIL	09/22/15	09/22/15	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	7.0 14	< 7.0 U 33 77.2%
MB-092215 15-16849	Method Blank HC ID: ---	09/22/15	09/22/15	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	5.0 10	< 5.0 U < 10 U 85.7%
AMU3N 15-16849	Apron-A-B5 HC ID: DIESEL/MOTOR OIL	09/22/15	09/22/15	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	7.3 15	9.9 47 80.3%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.

DL-Dilution of extract prior to analysis.

LOQ-Limit of Quantitation

Diesel range quantitation on total peaks in the range from C12 to C24.

Motor Oil range quantitation on total peaks in the range from C24 to C38.

HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

**ORGANICS ANALYSIS DATA SHEET**

NWTPHD by GC/FID


Page 1 of 1

Sample ID: Apron-A-B5  
MS/MSD

Lab Sample ID: AMU3N

LIMS ID: 15-16849

Matrix: Soil

Data Release Authorized: 

Reported: 09/23/15

QC Report No: AMU3-Boeing

Project: Boeing Renton Apron A

SE1516150

Date Sampled: 09/18/15

Date Received: 09/18/15

Date Extracted MS/MSD: 09/22/15

Sample Amount MS: 6.86 g-dry-wt

MSD: 6.86 g-dry-wt

Date Analyzed MS: 09/22/15 22:17

Final Extract Volume MS: 1.0 mL

MSD: 09/22/15 22:38

MSD: 1.0 mL

Instrument/Analyst MS: FID9/ML

Dilution Factor MS: 1.00

MSD: FID9/ML

MSD: 1.00

Percent Moisture: 31.7%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	9.9	190	219	82.2%	178	219	76.8%	6.5%

**TPHD Surrogate Recovery**

	MS	MSD
o-Terphenyl	86.4%	79.4%

Results reported in mg/kg

RPD calculated using sample concentrations per SW846.

**ORGANICS ANALYSIS DATA SHEET**

NWTPHD by GC/FID

Page 1 of 1

Sample ID: LCS-092215  
LCS/LCSD

Lab Sample ID: LCS-092215

LIMS ID: 15-16849

Matrix: Soil

Data Release Authorized: *MB*

Reported: 09/23/15

QC Report No: AMU3-Boeing

Project: Boeing Renton Apron A

SE1516150

Date Sampled: NA

Date Received: NA

Date Extracted LCS/LCSD: 09/22/15

Sample Amount LCS: 10.0 g-dry-wt

LCSD: 10.0 g-dry-wt

Date Analyzed LCS: 09/22/15 19:50

Final Extract Volume LCS: 1.0 mL

LCSD: 09/22/15 20:11

LCSD: 1.0 mL

Instrument/Analyst LCS: FID9/ML

Dilution Factor LCS: 1.00

LCSD: FID9/ML

LCSD: 1.00

Range	Spike		LCS		Spike		LCSD	
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	RPD	
Diesel	134	150	89.3%	136	150	90.7%	1.5%	

**TPHD Surrogate Recovery**

	LCS	LCSD
o-Terphenyl	92.4%	95.8%

Results reported in mg/kg

RPD calculated using sample concentrations per SW846.

**TPHD SURROGATE RECOVERY SUMMARY**

Matrix: Soil

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
Apron-A-B7	64.1%	0
Apron-A-B10	72.6%	0
Apron-A-B4	72.4%	0
Apron-A-B6	77.2%	0
092215MB	85.7%	0
092215LCS	92.4%	0
092215LCSD	95.8%	0
Apron-A-B5	80.3%	0
Apron-A-B5 MS	86.4%	0
Apron-A-B5 MSD	79.4%	0

**LCS/MB LIMITS      QC LIMITS**

(OTER) = o-Terphenyl

(50-150)

(50-150)

Prep Method: SW3546  
Log Number Range: 15-16837 to 15-16849

**TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT**


Matrix: Soil  
Date Received: 09/18/15

ARI Job: AMU3  
Project: Boeing Renton Apron A  
SE1516150

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
15-16837-AMU3B	Apron-A-B7	6.07 g	1.00 mL	D	09/22/15
15-16839-AMU3D	Apron-A-B10	6.65 g	1.00 mL	D	09/22/15
15-16844-AMU3I	Apron-A-B4	6.86 g	1.00 mL	D	09/22/15
15-16847-AMU3L	Apron-A-B6	7.12 g	1.00 mL	D	09/22/15
15-16849-092215MB1	Method Blank	10.0 g	1.00 mL	-	09/22/15
15-16849-092215LCS1	Lab Control	10.0 g	1.00 mL	-	09/22/15
15-16849-092215LCS1	Lab Control Dup	10.0 g	1.00 mL	-	09/22/15
15-16849-AMU3N	Apron-A-B5	6.86 g	1.00 mL	D	09/22/15
15-16849-AMU3NMS	Apron-A-B5	6.86 g	1.00 mL	D	09/22/15
15-16849-AMU3NMSD	Apron-A-B5	6.86 g	1.00 mL	D	09/22/15

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-Caulka  
SAMPLE

Lab Sample ID: AMU3E  
LIMS ID: 15-16840  
Matrix: solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Bocing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 18:10  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U

Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	85.0%
Tetrachlorometaxylene	90.5%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-CaulkB  
SAMPLE

Lab Sample ID: AMU3F  
LIMS ID: 15-16841  
Matrix: solid  
Data Release Authorized:  
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 18:32  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U


Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	79.8%
Tetrachlorometaxylene	74.8%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-CaulkC  
SAMPLE

Lab Sample ID: AMU3G  
LIMS ID: 15-16842  
Matrix: Solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 17:49  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U


Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	80.0%
Tetrachlorometaxylene	78.8%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-wire coating  
SAMPLE

Lab Sample ID: AMU30  
LIMS ID: 15-16850  
Matrix: solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 18:53  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U


Reported in ug/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	81.5%
Tetrachlorometaxylene	80.8%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-Blast fence paint  
SAMPLE

Lab Sample ID: AMU3P  
LIMS ID: 15-16851  
Matrix: solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 19:14  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	2,000	< 2,000 Y
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U


Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	87.8%
Tetrachlorometaxylene	81.5%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Page 1 of 1

Sample ID: Apron-A-CaulkC  
MS/MSD

Lab Sample ID: AMU3G  
LIMS ID: 15-16842  
Matrix: Solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted MS/MSD: 09/22/15  
Date Analyzed MS: 09/23/15 17:06  
MSD: 09/23/15 17:28  
Instrument/Analyst MS: ECD7/JGR  
MSD: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount MS: 1.00 g-as-rec  
MSD: 1.00 g-as-rec  
Final Extract Volume MS: 40 mL  
MSD: 40 mL  
Dilution Factor MS: 1.00  
MSD: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 800 U	17500	20000	87.5%	17100	20000	85.5%	2.3%
Aroclor 1260	< 800 U	18400	20000	92.0%	17800	20000	89.0%	3.3%

Results reported in µg/kg (ppb)  
RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-CaulkC  
MATRIX SPIKE

Lab Sample ID: AMU3G  
LIMS ID: 15-16842  
Matrix: Solid  
Data Release Authorized: *B*  
Reported: 09/24/15

QC Report No: AMU3-Bocing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 17:06  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	---
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	---
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U


Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	80.2%
Tetrachlorometaxylene	80.0%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: Apron-A-CaulkC  
MATRIX SPIKE DUP

Lab Sample ID: AMU3G  
LIMS ID: 15-16842  
Matrix: Solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 17:28  
Instrument/Analyst: ECD7/JGR  
GPC-Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g-as-rec  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	---
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	---
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U

Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	77.0%
Tetrachlorometaxylene	78.5%

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Extraction Method: SW3580A  
Page 1 of 1

Sample ID: MB-092215  
METHOD BLANK

Lab Sample ID: MB-092215  
LIMS ID: 15-16842  
Matrix: Solid  
Data Release Authorized: *[Signature]*  
Reported: 09/24/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: NA  
Date Received: NA

Date Extracted: 09/22/15  
Date Analyzed: 09/23/15 16:03  
Instrument/Analyst: ECD7/JGR  
GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Sample Amount: 1.00 g  
Final Extract Volume: 40.0 mL  
Dilution Factor: 1.00  
Silica Gel: Yes  
Percent Moisture: NA

CAS Number	Analyte	LOQ	Result
12674-11-2	Aroclor 1016	800	< 800 U
53469-21-9	Aroclor 1242	800	< 800 U
12672-29-6	Aroclor 1248	800	< 800 U
11097-69-1	Aroclor 1254	800	< 800 U
11096-82-5	Aroclor 1260	800	< 800 U
11104-28-2	Aroclor 1221	800	< 800 U
11141-16-5	Aroclor 1232	800	< 800 U

Reported in µg/kg (ppb)

**PCB Surrogate Recovery**

Decachlorobiphenyl	92.8%
Tetrachlorometaxylene	73.8%

SW8082/PCB SOIL/SOLID/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: solid


QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
Apron-A-CaulkA	85.0%	30-160	90.5%	30-160	0
Apron-A-CaulkB	79.8%	30-160	74.8%	30-160	0
MB-092215	92.8%	30-160	73.8%	30-160	0
LCS-092215	99.2%	30-160	79.0%	30-160	0
LCSD-092215	94.0%	30-160	76.2%	30-160	0
Apron-A-CaulkC	80.0%	30-160	78.8%	30-160	0
Apron-A-CaulkC MS	80.2%	30-160	80.0%	30-160	0
Apron-A-CaulkC MSD	77.0%	30-160	78.5%	30-160	0
Apron-A-wire coating	81.5%	30-160	80.8%	30-160	0
Apron-A-Blast fence paint	87.8%	30-160	81.5%	30-160	0

Medium Level Control Limits  
Prep Method: SW3580A  
Log Number Range: 15-16840 to 15-16851

ORGANICS ANALYSIS DATA SHEET  
PCB by GC/ECD Method SW8082A  
Page 1 of 1

Sample ID: LCS-092215  
LCS/LCSD

Lab Sample ID: LCS-092215  
LIMS ID: 15-16842  
Matrix: Solid  
Data Release Authorized:   
Reported: 09/24/15

QC Report No: AM03-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: NA  
Date Received: NA

Date Extracted LCS/LCSD: 09/22/15

Sample Amount LCS: 1.00 g-as-rec

Date Analyzed LCS: 09/23/15 16:24  
LCSD: 09/23/15 16:45

Final Extract Volume LCS: 40.0 mL  
LCSD: 40.0 mL

Instrument/Analyst LCS: ECD7/JGR  
LCSD: ECD7/JGR

Dilution Factor LCS: 1.00  
LCSD: 1.00

GPC Cleanup: No  
Sulfur Cleanup: No  
Acid Cleanup: Yes  
Florisil Cleanup: No

Silica Gel: Yes

Percent Moisture: NA

Analyte	Spike		LCS		Spike		RPD
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	
Aroclor 1016	19000	20000	95.0%	18100	20000	90.5%	4.9%
Aroclor 1260	22200	20000	111%	20900	20000	104%	6.0%

**PCB Surrogate Recovery**

	LCS	LCSD
Decachlorobiphenyl	99.2%	94.0%
Tetrachlorometaxylene	79.0%	76.2%

Results reported in µg/kg (ppb)  
RPD calculated using sample concentrations per SW846.

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: Apron-A-B7  
SAMPLE

Lab Sample ID: AMU3B

LIMS ID: 15-16837

Matrix: Soil

Data Release Authorized: 

Reported: 09/25/15

QC Report No: AMU3-Boeing

Project: Boeing Renton Apron A

SE1516150

Date Sampled: 09/17/15

Date Received: 09/18/15

Percent Total Solids: 55.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/23/15	6010C	09/24/15	7429-90-5	Aluminum	9	20,400	
3050B	09/23/15	6010C	09/24/15	7440-38-2	Arsenic	9	9	
3050B	09/23/15	6010C	09/24/15	7440-39-3	Barium	0.5	99.1	
3050B	09/23/15	6010C	09/24/15	7440-43-9	Cadmium	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-70-2	Calcium	9	6,760	
3050B	09/23/15	6010C	09/24/15	7440-47-3	Chromium	0.9	39.1	
3050B	09/23/15	6010C	09/24/15	7440-48-4	Cobalt	0.5	10.3	
3050B	09/23/15	6010C	09/24/15	7440-50-8	Copper	0.3	33.2	
3050B	09/23/15	6010C	09/24/15	7439-89-6	Iron	9	22,300	
3050B	09/23/15	6010C	09/24/15	7439-92-1	Lead	3	4	
3050B	09/23/15	6010C	09/24/15	7439-95-4	Magnesium	9	6,660	
3050B	09/23/15	6010C	09/24/15	7439-98-7	Molybdenum	0.9	0.9	
3050B	09/23/15	6010C	09/24/15	7440-02-0	Nickel	2	33	
3050B	09/23/15	6010C	09/24/15	7440-22-4	Silver	0.5	0.5	U
3050B	09/23/15	6010C	09/24/15	7440-66-6	Zinc	2	47	

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B7  
DUPLICATE

Lab Sample ID: AMU3B  
LIMS ID: 15-16837  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/25/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/17/15  
Date Received: 09/18/15

**MATRIX DUPLICATE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010C	20,400	20,200	1.0%	+/- 20%	
Arsenic	6010C	9	9	0.0%	+/- 9	L
Barium	6010C	99.1	97.1	2.0%	+/- 20%	
Cadmium	6010C	0.3 U	0.3 U	0.0%	+/- 0.3	L
Calcium	6010C	6,760	6,920	2.3%	+/- 20%	
Chromium	6010C	39.1	37.5	4.2%	+/- 20%	
Cobalt	6010C	10.3	10.0	3.0%	+/- 20%	
Copper	6010C	33.2	32.7	1.5%	+/- 20%	
Iron	6010C	22,300	22,400	0.4%	+/- 20%	
Lead	6010C	4	4	0.0%	+/- 3	L
Magnesium	6010C	6,660	6,570	1.4%	+/- 20%	
Molybdenum	6010C	0.9	1.0	10.5%	+/- 0.9	L
Nickel	6010C	33	32	3.1%	+/- 20%	
Silver	6010C	0.5 U	0.5 U	0.0%	+/- 0.5	L
Zinc	6010C	47	48	2.1%	+/- 20%	

Reported in mg/kg-dry

\*-Control Limit Not Met

L-RPD Invalid, Limit = Detection Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B7  
MATRIX SPIKE

Lab Sample ID: AMU3B  
LIMS ID: 15-16837  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/25/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/17/15  
Date Received: 09/18/15

**MATRIX SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010C	20,400	20,500	345	29.0%	H
Arsenic	6010C	9	346	345	97.7%	
Barium	6010C	99.1	456	345	103%	
Cadmium	6010C	0.3 U	84.7	86.3	98.1%	
Calcium	6010C	6,760	8,910	1,730	124%	
Chromium	6010C	39.1	122	86.3	96.1%	
Cobalt	6010C	10.3	94.3	86.3	97.3%	
Copper	6010C	33.2	117	86.3	97.1%	
Iron	6010C	22,300	24,300	345	580%	H
Lead	6010C	4	334	345	95.7%	
Magnesium	6010C	6,660	8,680	1,730	117%	
Molybdenum	6010C	0.9	77.8	86.3	89.1%	
Nickel	6010C	33	123	86.3	104%	
Silver	6010C	0.5 U	88.3	86.3	102%	
Zinc	6010C	47	133	86.3	99.7%	

Reported in mg/kg-dry

N-Control Limit Not Met

H-% Recovery Not Applicable, Sample Concentration Too High

NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B4  
SAMPLE

Lab Sample ID: AMU3I  
LIMS ID: 15-16844  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/25/15



QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Percent Total Solids: 70.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/23/15	6010C	09/24/15	7429-90-5	Aluminum	7	18,200	
3050B	09/23/15	6010C	09/24/15	7440-38-2	Arsenic	7	8	
3050B	09/23/15	6010C	09/24/15	7440-39-3	Barium	0.4	87.7	
3050B	09/23/15	6010C	09/24/15	7440-43-9	Cadmium	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-70-2	Calcium	7	5,870	
3050B	09/23/15	6010C	09/24/15	7440-47-3	Chromium	0.7	38.3	
3050B	09/23/15	6010C	09/24/15	7440-48-4	Cobalt	0.4	9.8	
3050B	09/23/15	6010C	09/24/15	7440-50-8	Copper	0.3	27.4	
3050B	09/23/15	6010C	09/24/15	7439-89-6	Iron	7	21,700	
3050B	09/23/15	6010C	09/24/15	7439-92-1	Lead	3	5	
3050B	09/23/15	6010C	09/24/15	7439-95-4	Magnesium	7	6,750	
3050B	09/23/15	6010C	09/24/15	7439-98-7	Molybdenum	0.7	0.8	
3050B	09/23/15	6010C	09/24/15	7440-02-0	Nickel	1	34	
3050B	09/23/15	6010C	09/24/15	7440-22-4	Silver	0.4	0.4	U
3050B	09/23/15	6010C	09/24/15	7440-66-6	Zinc	1	47	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B6  
SAMPLE

Lab Sample ID: AMU3L  
LIMS ID: 15-16847  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/25/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Percent Total Solids: 74.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/23/15	6010C	09/24/15	7429-90-5	Aluminum	6	22,800	
3050B	09/23/15	6010C	09/24/15	7440-38-2	Arsenic	6	8	
3050B	09/23/15	6010C	09/24/15	7440-39-3	Barium	0.4	112	
3050B	09/23/15	6010C	09/24/15	7440-43-9	Cadmium	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-70-2	Calcium	6	5,920	
3050B	09/23/15	6010C	09/24/15	7440-47-3	Chromium	0.6	45.1	
3050B	09/23/15	6010C	09/24/15	7440-48-4	Cobalt	0.4	12.6	
3050B	09/23/15	6010C	09/24/15	7440-50-8	Copper	0.3	33.2	
3050B	09/23/15	6010C	09/24/15	7439-89-6	Iron	6	27,400	
3050B	09/23/15	6010C	09/24/15	7439-92-1	Lead	3	4	
3050B	09/23/15	6010C	09/24/15	7439-95-4	Magnesium	6	7,550	
3050B	09/23/15	6010C	09/24/15	7439-98-7	Molybdenum	0.6	0.8	
3050B	09/23/15	6010C	09/24/15	7440-02-0	Nickel	1	39	
3050B	09/23/15	6010C	09/24/15	7440-22-4	Silver	0.4	0.4	U
3050B	09/23/15	6010C	09/24/15	7440-66-6	Zinc	1	48	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B5  
SAMPLE

Lab Sample ID: AMU3N  
LIMS ID: 15-16849  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/25/15

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: 09/18/15  
Date Received: 09/18/15

Percent Total Solids: 70.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/23/15	6010C	09/24/15	7429-90-5	Aluminum	7	17,800	
3050B	09/23/15	6010C	09/24/15	7440-38-2	Arsenic	7	8	
3050B	09/23/15	6010C	09/24/15	7440-39-3	Barium	0.4	83.6	
3050B	09/23/15	6010C	09/24/15	7440-43-9	Cadmium	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-70-2	Calcium	7	5,920	
3050B	09/23/15	6010C	09/24/15	7440-47-3	Chromium	0.7	33.0	
3050B	09/23/15	6010C	09/24/15	7440-48-4	Cobalt	0.4	9.6	
3050B	09/23/15	6010C	09/24/15	7440-50-8	Copper	0.3	23.6	
3050B	09/23/15	6010C	09/24/15	7439-89-6	Iron	7	20,900	
3050B	09/23/15	6010C	09/24/15	7439-92-1	Lead	3	5	
3050B	09/23/15	6010C	09/24/15	7439-95-4	Magnesium	7	6,370	
3050B	09/23/15	6010C	09/24/15	7439-98-7	Molybdenum	0.7	0.7	
3050B	09/23/15	6010C	09/24/15	7440-02-0	Nickel	1	30	
3050B	09/23/15	6010C	09/24/15	7440-22-4	Silver	0.4	0.4	U
3050B	09/23/15	6010C	09/24/15	7440-66-6	Zinc	1	47	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Sample ID: METHOD BLANK

Page 1 of 1

Lab Sample ID: AMU3MB

QC Report No: AMU3-Boeing

LIMS ID: 15-16844

Project: Boeing Renton Apron A

Matrix: Soil

SE1516150

Data Release Authorized:

Date Sampled: NA

Reported: 09/25/15

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/23/15	6010C	09/24/15	7429-90-5	Aluminum	5	5	U
3050B	09/23/15	6010C	09/24/15	7440-38-2	Arsenic	5	5	U
3050B	09/23/15	6010C	09/24/15	7440-39-3	Barium	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-43-9	Cadmium	0.2	0.2	U
3050B	09/23/15	6010C	09/24/15	7440-70-2	Calcium	5	5	U
3050B	09/23/15	6010C	09/24/15	7440-47-3	Chromium	0.5	0.5	U
3050B	09/23/15	6010C	09/24/15	7440-48-4	Cobalt	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-50-8	Copper	0.2	0.2	U
3050B	09/23/15	6010C	09/24/15	7439-89-6	Iron	5	5	U
3050B	09/23/15	6010C	09/24/15	7439-92-1	Lead	2	2	U
3050B	09/23/15	6010C	09/24/15	7439-95-4	Magnesium	5	5	U
3050B	09/23/15	6010C	09/24/15	7439-98-7	Molybdenum	0.5	0.5	U
3050B	09/23/15	6010C	09/24/15	7440-02-0	Nickel	1	1	U
3050B	09/23/15	6010C	09/24/15	7440-22-4	Silver	0.3	0.3	U
3050B	09/23/15	6010C	09/24/15	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: AMU3LCS  
LIMS ID: 15-16844  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/25/15

*EF*

QC Report No: AMU3-Boeing  
Project: Boeing Renton Apron A  
SE1516150  
Date Sampled: NA  
Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	205	200	102%	
Arsenic	6010C	206	200	103%	
Barium	6010C	212	200	106%	
Cadmium	6010C	49.3	50.0	98.6%	
Calcium	6010C	1010	1000	101%	
Chromium	6010C	53.0	50.0	106%	
Cobalt	6010C	50.3	50.0	101%	
Copper	6010C	50.8	50.0	102%	
Iron	6010C	207	200	104%	
Lead	6010C	199	200	99.5%	
Magnesium	6010C	1050	1000	105%	
Molybdenum	6010C	50.9	50.0	102%	
Nickel	6010C	52	50	104%	
Silver	6010C	53.4	50.0	107%	
Zinc	6010C	50	50	100%	

Reported in mg/kg-dry

N-Control limit not met  
NA-Not Applicable, Analyte Not Spiked  
Control Limits: 80-120%



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

September 30, 2015

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101



**RE: Project: Boeing Renton Apron A**  
**ARI Job: ANE6**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted fifteen soil/solid samples and a trip blank in good condition on September 18, 2015. Please see cooler receipt form for discrepancies.

The samples were originally analyzed for Total Metals, VOCs, PCBs, NWTPH-Dx and NWTPH-Gx, as requested on the COC and reported under AMU3.

Apron- A-B10 was originally missed for metals analysis and is now included in this data package.

There were no anomalies associated with the sample.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Kelly Bottom  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **ANU3** Turn-around Requested: **Standard** Page: **1** of **2**  
 ARI Client Company: **AMEC Foster Wheeler 200-312-1740** Phone: **200-312-1740** Date: **9/10/15** Ice Present? **Yes**  
 Client Contact: **Maestri ThimSen** No. of Coolers: **1.4** Cooler Temps: **1.4**  
 Client Project Name: **Boeing Renton Apron A** Analysis Requested: **TPH-G, VOS, PCBs, Metals, Hold PCBs + TCM Metals**  
 Client Project #: **SE15161560** Samplers: **S. Bolkow**



Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested					Notes/Comments
					TPH-G	VOS	PCBs	Metals	Hold PCBs + TCM Metals	
APRON-A-B7	9/17/15	16:35	SOIL	6	X	X	X	X	X	Composite
APRON-A-B7	↓	16:45	SOIL	2	X	X	X	X	X	Composite
APRON-A-B10	↓	17:10	SOIL	6	X	X	X	X	X	Composite
APRON-A-B10	↓	17:20	SOIL	2	X	X	X	X	X	Composite
APRON-A-Caulk A	9/18/15	8:05	Caulk	1	X	X	X	X	X	Composite
APRON-A-Caulk B	↓	8:00	Caulk	1	X	X	X	X	X	
APRON-A-Caulk C	↓	8:10	Caulk	1	X	X	X	X	X	
APRON-A-B34	↓	10:15	SOIL	6	X	X	X	X	X	Composite
APRON-A-B4	↓	10:20	SOIL	2	X	X	X	X	X	Composite
Trip Blank	↓	-	Water	2						
Comments/Special Instructions Boeing Contract Nancy Swenson	Relinquished by: (Signature) <b>[Signature]</b> Date & Time: <b>9/10/15 1555</b> Relinquished by: (Signature) <b>[Signature]</b> Date & Time: <b>9/10/15 1666</b> Printed Name: <b>Jennifer Bolkow</b> Company: <b>AMEC Foster Wheeler</b> Printed Name: <b>Emily Litwin</b> Company: <b>ARI</b>									

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: AM13 Turn-around Requested: Standard

ARI Client Company: AMEC Phone: 206-3421700

Client Contact: Cynthia Thimsen

Client Project Name: Boeing Renton Apron A

Client Project #: SE1516560 Samplers: S Bellamy

Page: 2 of 2

Date: 9/18/15 Ice Present? YES

No. of Coolers: 1 Cooler Temps: 1.4

Analytical Resources, Incorporated  
Analytical Chemists and Consultants  
4611 South 134th Place, Suite 100  
Tukwila, WA 98168  
206-695-6200 206-695-6201 (fax)  
www.arilabs.com



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested						Notes/Comments	
					TOH-DXLL w/cool S/100 G/L IS/100 G/L S/100 G/L	PCBS	TOH-G	VOCs	Total Solids	Hold for SACS + T/CP MTR		
Apron-A-B6	9/18/15	10:50	Soil	6	X		X	X	X			
Apron-A-B6		10:55	Soil	2	X		X	X	X			Composited
Apron-A-B5		11:45	Soil	6	X		X	X	X			Composited
Apron-A-B5		11:50	Soil	2	X		X	X	X			Composited
Apron-A wire coating		14:30	wire coating	1			X					
Apron-A-Blasterc-paint		14:25	paint	1			X					
Comments/Special Instructions	see page 1											
Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>Jeanette Bellamy</u> Company: <u>AMEC Foster Wheeler</u> Date & Time: <u>9/18/15 15:55</u>					Received by: (Signature) <u>[Signature]</u> Printed Name: <u>EMILY VANVIN</u> Company: <u>ARI</u> Date & Time: <u>9/18/15 16:06</u>							

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

# Sample ID Cross Reference Report



ARI Job No: ANE6  
Client: AMEC Environment & Infrastructure  
Project Event: SE15161560  
Project Name: Boeing Renton Apron A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron A-B10	ANE6A	15-17206	Soil	09/17/15 17:20	09/18/15 15:55

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron A-B10

SAMPLE

Lab Sample ID: ANE6A

LIMS ID: 15-17206

Matrix: Soil

Data Release Authorized:

Reported: 09/30/15

QC Report No: ANE6-AMFC Environment & Infrastructure

Project: Boeing Renton Apron A

SE15161560

Date Sampled: 09/17/15

Date Received: 09/18/15

Percent Total Solids: 75.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/28/15	6010C	09/28/15	7429-90-5	Aluminum	6	19,700	
3050B	09/28/15	6010C	09/28/15	7440-38-2	Arsenic	6	9	
3050B	09/28/15	6010C	09/28/15	7440-39-3	Barium	0.4	87.0	
3050B	09/28/15	6010C	09/28/15	7440-43-9	Cadmium	0.2	0.2	U
3050B	09/28/15	6010C	09/28/15	7440-70-2	Calcium	6	5,600	
3050B	09/28/15	6010C	09/28/15	7440-47-3	Chromium	0.6	37.2	
3050B	09/28/15	6010C	09/28/15	7440-48-4	Cobalt	0.4	10.9	
3050B	09/28/15	6010C	09/28/15	7440-50-8	Copper	0.2	28.1	
3050B	09/28/15	6010C	09/28/15	7439-89-6	Iron	6	23,300	
3050B	09/28/15	6010C	09/28/15	7439-92-1	Lead	2	4	
3050B	09/28/15	6010C	09/28/15	7439-95-4	Magnesium	6	6,790	
3050B	09/28/15	6010C	09/28/15	7439-98-7	Molybdenum	0.6	0.7	
3050B	09/28/15	6010C	09/28/15	7440-02-0	Nickel	1	33	
3050B	09/28/15	6010C	09/28/15	7440-22-4	Silver	0.4	0.4	U
3050B	09/28/15	6010C	09/28/15	7440-66-6	Zinc	1	52	

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: ANE6MB  
LIMS ID: 15-17206  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/30/15

QC Report No: ANE6-AMEC Environment & Infrastructure  
Project: Boeing Renton Apron A  
SE15161560  
Date Sampled: NA  
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	09/28/15	6010C	09/29/15	7429-90-5	Aluminum	5	5	U
3050B	09/28/15	6010C	09/29/15	7440-38-2	Arsenic	5	5	U
3050B	09/28/15	6010C	09/29/15	7440-39-3	Barium	0.3	0.3	U
3050B	09/28/15	6010C	09/29/15	7440-43-9	Cadmium	0.2	0.2	U
3050B	09/28/15	6010C	09/29/15	7440-70-2	Calcium	5	5	U
3050B	09/28/15	6010C	09/29/15	7440-47-3	Chromium	0.5	0.5	U
3050B	09/28/15	6010C	09/29/15	7440-48-4	Cobalt	0.3	0.3	U
3050B	09/28/15	6010C	09/29/15	7440-50-8	Copper	0.2	0.2	U
3050B	09/28/15	6010C	09/29/15	7439-89-6	Iron	5	5	U
3050B	09/28/15	6010C	09/29/15	7439-92-1	Lead	2	2	U
3050B	09/28/15	6010C	09/29/15	7439-95-4	Magnesium	5	5	U
3050B	09/28/15	6010C	09/29/15	7439-98-7	Molybdenum	0.5	0.5	U
3050B	09/28/15	6010C	09/29/15	7440-02-0	Nickel	1	1	U
3050B	09/28/15	6010C	09/29/15	7440-22-4	Silver	0.3	0.3	U
3050B	09/28/15	6010C	09/29/15	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: ANE6LCS  
LIMS ID: 15-17206  
Matrix: Soil  
Data Release Authorized:  
Reported: 09/30/15



QC Report No: ANE6-AMEC Environment & Infrastructure  
Project: Boeing Renton Apron A  
SE15161560  
Date Sampled: NA  
Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	201	200	100%	
Arsenic	6010C	197	200	98.5%	
Barium	6010C	206	200	103%	
Cadmium	6010C	48.5	50.0	97.0%	
Calcium	6010C	968	1000	96.8%	
Chromium	6010C	51.7	50.0	103%	
Cobalt	6010C	49.0	50.0	98.0%	
Copper	6010C	50.1	50.0	100%	
Iron	6010C	203	200	102%	
Lead	6010C	191	200	95.5%	
Magnesium	6010C	1020	1000	102%	
Molybdenum	6010C	48.7	50.0	97.4%	
Nickel	6010C	50	50	100%	
Silver	6010C	52.1	50.0	104%	
Zinc	6010C	48	50	96.0%	

Reported in mg/kg-dry

N-Control limit not met  
NA-Not Applicable, Analyte Not Spiked  
Control Limits: 80-120%



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

February 10, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101

**RE: Project: Boeing Renton Apron A**  
**ARI Job: AVO7**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted one water sample and a trip blank in good condition on February 5, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for Total and Dissolved Metals, VOCs, NWTPH-Dx and NWTPH-Gx, as requested on the COC.

The VOCs CCAL is out of control low for all associated FORM III "Q" flagged analytes with the exception of chloromethane and 1,1-Dichloroethene which are out of control high. All associated samples that contain analyte have been flagged with a "Q" qualifier.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Kelly Bottom  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **AN07** Turn-around Requested: **5-days** Page: **1** of **1**  
 ARI Client Company: **PMEC Esterhuizen** Phone: **206-888-8169** Ice Present? **Yes**  
 Client Contact: **Crystal Thimsen** No. of Coolers: **1** Cooler Temps: **3.5°C**  
 Client Project Name: **Boeing ARRA A** Samplers: **S. Bellum**

Sample ID	Date	Time	Matrix	No Containers
ARRA-A-B-15-GW	2/5/16	13:15	Water	11
TRIP Blanks-09056	2/5/16	-	Water	0



Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com

Sample ID	Analysis Requested				Notes/Comments
	Metals Total Metals Pb, Cd, Cu, Ni, Zn As, Cr, Fe, Mn, Mo Se, V, W, Bi, Sb, Sn, Ti Co, Al, Ag, Br, Hg, I, K, Li, Na, Ni, S, Si, Sr, Tl, U, Y, Ba, Be, Bi, B, Br, Ca, Cl, Cr, F, Ga, Ge, In, Mg, P, Pb, Pt, Se, Si, Sn, Ti, Tl, U, V, W, Zn, Ag, Au, Ba, Be, Bi, B, Br, Ca, Cd, Ce, Co, Cr, Cs, Fe, Ga, Ge, Hg, I, In, K, Li, Mg, Mn, Mo, Ni, N, O, Os, Pb, Pt, Rb, S, Sb, Se, Si, Sn, Sr, Ta, Te, Th, Tl, U, V, W, Xe, Y, Zn, Zr	PAHs Total PAHs Acenaphthene, Anthracene, Benzo[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[e]pyrene, Benzo[a]fluoranthene, Indeno[1,2,3-cd]perylene, Naphthalene, Phenanthrene, Pyrene	PCBs Total PCBs 2,2',4,4'-Tetrachlorobiphenyl, 2,2',4,4'-Tetrachlorodiphenyl ether, 2,2',3,4'-Tetrachlorobiphenyl, 2,2',3,5'-Tetrachlorobiphenyl, 2,2',4,5'-Tetrachlorobiphenyl, 2,2',4,4'-Tetrachlorodiphenyl ether, 2,2',3,4'-Tetrachlorodiphenyl ether, 2,2',3,5'-Tetrachlorodiphenyl ether, 2,2',4,5'-Tetrachlorodiphenyl ether, 2,2',3,4'-Tetrachlorodiphenyl ether, 2,2',3,5'-Tetrachlorodiphenyl ether, 2,2',4,5'-Tetrachlorodiphenyl ether	DDTs Total DDTs DDE, DDD, DDT, DDDT, DDDT, DDDT, DDDT	
ARRA-A-B-15-GW	X	X	X	X	
TRIP Blanks-09056	X	X	X	X	

Comments/Special Instructions send results to Deis Turner	Relinquished by (Signature) <i>Jessie Bellum</i>	Received by (Signature) <i>Tyler Rankin</i>
	Printed Name <i>Jessie Bellum</i>	Printed Name <i>Tyler Rankin</i>
	Company <i>PMEC Esterhuizen</i>	Company <i>ARI</i>
	Date & Time <i>2/5/16 1519</i>	Date & Time <i>2-5-16 1514</i>

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: AMEC

Project Name: \_\_\_\_\_

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: \_\_\_\_\_

Assigned ARI Job No: AVO7

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES (NO)

Were custody papers properly filled out (ink, signed, etc.) YES (NO)

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.5

Time: \_\_\_\_\_

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005276

Cooler Accepted by: TR Date: 2-5-16 Time: 1519

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies (Foam Block) Paper Other:

Was sufficient ice used (if appropriate)? NA YES (NO)

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? YES (NO)

Were all bottle labels complete and legible? YES (NO)

Did the number of containers listed on COC match with the number of containers received? YES (NO)

Did all bottle labels and tags agree with custody papers? YES (NO)

Were all bottles used correct for the requested analyses? YES (NO)

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES (NO)

Were all VOC vials free of air bubbles? NA YES (NO)

Was sufficient amount of sample sent in each bottle? YES (NO)

Date VOC Trip Blank was made at ARI: \_\_\_\_\_ (NA)

Was Sample Split by ARI: (NA) YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: CEA Date: 2/5/16 Time: 0043

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_

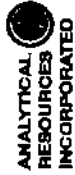
<b>Small Air Bubbles</b> - 2mm	<b>Peabubbles</b> 2-4 mm	<b>LARGE Air Bubbles</b> > 4 mm	Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)

# Sample ID Cross Reference Report



ARI Job No: AVO7  
Client: The Boeing Company  
Project Event: Boeing Apron A  
Project Name: N/A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron-A-B-15-GW	AVO7A	16-1923	Water	02/05/16 13:15	02/05/16 15:19
2. Trip Blank-020516	AVO7B	16-1924	Water	02/05/16	02/05/16 15:19
3. Apron-A-B-15-020516	AVO7C	16-1925	Water	02/05/16 13:15	02/05/16 15:19



ARI Job No: AVO7  
 PC: Kelly  
 VTSR: 02/05/16

Inquiry Number: NONE  
 Analysis Requested: 02/08/16  
 Contact: Turner, Doris  
 Client: The Boeing Company  
 Logged by: CA  
 Sample Set Used: Yes-481  
 Validatable Package:  
 Deliverables:

Project #: Boeing Apron A  
 Project:  
 Sample Site:  
 SDG No:  
 Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	TPHD <2	Fe2+ <2	DMET DOC FLT FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
16-1923 AVO7A	Apron-A-B-15-G#						TOI 1076														
16-1925 AVO7C	Apron-A-B-15-020516															Y					

Checked By CA Date 2/8/16

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG

Sample ID: Apron-A-B-15-GW  
SAMPLE

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Lab Sample ID: AVO7A

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1923

Project: Boeing Apron A

Matrix: Water

Data Release Authorized:

Date Sampled: 02/05/16

Reported: 02/09/16

Date Received: 02/05/16

Instrument/Analyst: NT3/PKC

Sample Amount: 10.0 mL

Date Analyzed: 02/08/16 16:44

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
74-87-3	Chloromethane	0.50	< 0.50	U	
74-83-9	Bromomethane	1.0	< 1.0	U	
<b>75-01-4</b>	<b>Vinyl Chloride</b>	<b>0.20</b>	<b>16</b>		
75-00-3	Chloroethane	0.20	< 0.20	U	
75-09-2	Methylene Chloride	1.0	< 1.0	U	
<b>67-64-1</b>	<b>Acetone</b>	<b>5.0</b>	<b>7.7</b>		
75-15-0	Carbon Disulfide	0.20	< 0.20	U	
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U	
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U	
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U	
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U	
67-66-3	Chloroform	0.20	< 0.20	U	
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U	
78-93-3	2-Butanone	5.0	< 5.0	U	
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U	
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U	
108-05-4	Vinyl Acetate	0.20	< 0.20	U	
75-27-4	Bromodichloromethane	0.20	< 0.20	U	
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U	
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U	
79-01-6	Trichloroethene	0.20	< 0.20	U	
124-48-1	Dibromochloromethane	0.20	< 0.20	U	
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U	
71-43-2	Benzene	0.20	< 0.20	U	
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U	
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U	
75-25-2	Bromoform	0.20	< 0.20	U	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U	
591-78-6	2-Hexanone	5.0	< 5.0	U	
127-18-4	Tetrachloroethene	0.20	< 0.20	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U	
108-88-3	Toluene	0.20	< 0.20	U	
108-90-7	Chlorobenzene	0.20	< 0.20	U	
100-41-4	Ethylbenzene	0.20	< 0.20	U	
100-42-5	Styrene	0.20	< 0.20	U	
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U	
179601-23-1	m,p-Xylene	0.40	< 0.40	U	
95-47-6	o-Xylene	0.20	< 0.20	U	
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U	
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U	
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U	

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG

Page 2 of 2



Sample ID: Apron-A-B-15-GW  
SAMPLE

Lab Sample ID: AVO7A

LIMS ID: 16-1923

Matrix: Water

Date Analyzed: 02/08/16 16:44

QC Report No: AVO7-The Boeing Company

Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
107-02-8	Acrolein	5.0	< 5.0	U	
74-88-4	Iodomethane	1.0	< 1.0	U	
74-96-4	Bromoethane	0.20	< 0.20	U	
107-13-1	Acrylonitrile	1.0	< 1.0	J	
563-58-6	1,1-Dichloropropene	0.20	< 0.20	J	
74-95-3	Dibromomethane	0.20	< 0.20	U	
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	J	
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	J	
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	J	
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	J	
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	J	
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	J	
87-68-3	Hexachlorobutadiene	0.50	< 0.50	J	
106-93-4	1,2-Dibromoethane	0.20	< 0.20	J	
74-97-5	Bromochloromethane	0.20	< 0.20	J	
594-20-7	2,2-Dichloropropane	0.20	< 0.20	J	
142-28-9	1,3-Dichloropropane	0.20	< 0.20	J	
98-82-8	Isopropylbenzene	0.20	< 0.20	J	
103-65-1	n-Propylbenzene	0.20	< 0.20	J	
108-86-1	Bromobenzene	0.20	< 0.20	J	
95-49-8	2-Chlorotoluene	0.20	< 0.20	J	
106-43-4	4-Chlorotoluene	0.20	< 0.20	J	
98-06-6	tert-Butylbenzene	0.20	< 0.20	U	
135-98-8	sec-Butylbenzene	0.20	< 0.20	U	
99-87-6	4-Isopropyltoluene	0.20	< 0.20	J	
104-51-8	n-Butylbenzene	0.20	< 0.20	J	
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	J	
91-20-3	Naphthalene	0.50	< 0.50	U	
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	J	

Reported in µg/L (ppb)

86290-81-5	Gasoline Range Hydrocarbons	0.10	< 0.10	U	---
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Reported in mg/L (ppm)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	112%
d8-Toluene	98.4%
Bromofluorobenzene	97.2%
d4-1,2-Dichlorobenzene	102%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Sample ID: Trip Blank-020516

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**SAMPLE**

Lab Sample ID: AVO7B

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1924

Project: Boeing Apron A

Matrix: Water

Data Release Authorized: *[Signature]*

Date Sampled: 02/05/16

Reported: 02/09/16

Date Received: 02/05/16

Instrument/Analyst: NT3/PKC

Sample Amount: 10.0 mL

Date Analyzed: 02/08/16 16:18

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

Lab Sample ID: AVO7B

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1924

Project: Boeing Apron A

Matrix: Water

Date Analyzed: 02/08/16 16:18

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	109%
d8-Toluene	99.2%
Bromofluorobenzene	93.2%
d4-1,2-Dichlorobenzene	97.0%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG

Sample ID: MB-020816A

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METHOD BLANK

Lab Sample ID: MB-020816A

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1923

Project: Boeing Apron A

Matrix: Water

Data Release Authorized: *B*

Date Sampled: NA

Reported: 02/09/16

Date Received: NA

Instrument/Analyst: NT3/PKC

Sample Amount: 10.0 mL

Date Analyzed: 02/08/16 15:27

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
74-87-3	Chloromethane	0.50	< 0.50	U	
74-83-9	Bromomethane	1.0	< 1.0	U	
75-01-4	Vinyl Chloride	0.20	< 0.20	U	
75-00-3	Chloroethane	0.20	< 0.20	U	
75-09-2	Methylene Chloride	1.0	< 1.0	U	
67-64-1	Acetone	5.0	< 5.0	U	
75-15-0	Carbon Disulfide	0.20	< 0.20	U	
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U	
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U	
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U	
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U	
67-66-3	Chloroform	0.20	< 0.20	U	
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U	
78-93-3	2-Butanone	5.0	< 5.0	U	
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U	
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U	
108-05-4	Vinyl Acetate	0.20	< 0.20	U	
75-27-4	Bromodichloromethane	0.20	< 0.20	U	
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U	
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U	
79-01-6	Trichloroethene	0.20	< 0.20	U	
124-48-1	Dibromochloromethane	0.20	< 0.20	U	
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U	
71-43-2	Benzene	0.20	< 0.20	U	
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U	
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U	
75-25-2	Bromoform	0.20	< 0.20	U	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U	
591-78-6	2-Hexanone	5.0	< 5.0	U	
127-18-4	Tetrachloroethene	0.20	< 0.20	U	
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U	
108-88-3	Toluene	0.20	< 0.20	U	
108-90-7	Chlorobenzene	0.20	< 0.20	U	
100-41-4	Ethylbenzene	0.20	< 0.20	U	
100-42-5	Styrene	0.20	< 0.20	U	
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U	
179601-23-1	m,p-Xylene	0.40	< 0.40	U	
95-47-6	o-Xylene	0.20	< 0.20	U	
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U	
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U	
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U	

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW9260C/NWTPHG

Sample ID: MB-020816A

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METHOD BLANK

Lab Sample ID: MB-020816A

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1923

Project: Boeing Apron A

Matrix: Water

Date Analyzed: 02/08/16 15:27

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
107-02-8	Acrolein	5.0	< 5.0	U	
74-88-4	Iodomethane	1.0	< 1.0	U	
74-96-4	Bromoethane	0.20	< 0.20	U	
107-13-1	Acrylonitrile	1.0	< 1.0	U	
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U	
74-95-3	Dibromomethane	0.20	< 0.20	U	
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U	
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U	
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U	
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U	
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U	
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U	
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U	
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U	
74-97-5	Bromochloromethane	0.20	< 0.20	U	
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U	
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U	
98-82-8	Isopropylbenzene	0.20	< 0.20	U	
103-65-1	n-Propylbenzene	0.20	< 0.20	U	
108-86-1	Bromobenzene	0.20	< 0.20	U	
95-49-8	2-Chlorotoluene	0.20	< 0.20	U	
106-43-4	4-Chlorotoluene	0.20	< 0.20	U	
98-06-6	tert-Butylbenzene	0.20	< 0.20	U	
135-98-8	sec-Butylbenzene	0.20	< 0.20	U	
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U	
104-51-8	n-Butylbenzene	0.20	< 0.20	U	
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U	
91-20-3	Naphthalene	0.50	< 0.50	U	
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U	

Reported in µg/L (ppb)

86290-81-5	Gasoline Range Hydrocarbons	0.10	< 0.10	U	---
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Reported in mg/L (ppm)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	112%
d8-Toluene	99.2%
Bromofluorobenzene	94.6%
d4-1,2-Dichlorobenzene	98.6%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AVO7-The Boeing Company  
Project: Boeing Apron A

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-020816A	Method Blank	10	112%	99.2%	94.6%	98.6%	0
LCS-020816A	Lab Control	10	111%	102%	94.6%	101%	0
LCSD-020816A	Lab Control Dup	10	111%	97.8%	95.0%	102%	0
AVO7A	Apron-A-B-15-GW	10	112%	98.4%	97.2%	102%	0
LCS-020816A	Lab Control	10	109%	103%	95.4%	101%	0
LCSD-020816A	Lab Control Dup	10	107%	101%	101%	96.2%	0
AVO7B	Trip Blank-C2C516	10	109%	99.2%	93.2%	97.0%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane	(80-129)	(80-129)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5C30B  
Log Number Range: 16-1923 to 16-1924

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: LCS-020816A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-020816A

LIMS ID: 16-1924

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 02/09/16

QC Report No: AVO7-The Boeing Company

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Instrument/Analyst LCS: NT3/PKC

LCS: NT3/PKC

Date Analyzed LCS: 02/08/16 13:43

LCS: 02/08/16 14:09

Sample Amount LCS: 10.0 mL

LCS: 10.0 mL

Purge Volume LCS: 10.0 mL

LCS: 10.0 mL

Analyte	LCS		LCS		LCS		RPD
	Conc	Spiked	Recovery	Conc	Spiked	Recovery	
Chloromethane	12.4 Q	10.0	124%	12.5 Q	10.0	125%	0.8%
Bromomethane	10.4	10.0	104%	10.8	10.0	108%	3.8%
Vinyl Chloride	11.6	10.0	116%	11.6	10.0	116%	0.0%
Chloroethane	10.6	10.0	106%	10.8	10.0	108%	1.9%
Methylene Chloride	10.4	10.0	104%	10.4	10.0	104%	0.0%
Acetone	57.0	50.0	114%	58.7	50.0	117%	2.9%
Carbon Disulfide	10.9	10.0	109%	11.1	10.0	111%	1.8%
1,1-Dichloroethene	11.9 Q	10.0	119%	12.0 Q	10.0	120%	0.8%
1,1-Dichloroethane	11.0	10.0	110%	11.1	10.0	111%	0.9%
trans-1,2-Dichloroethene	10.6	10.0	106%	10.8	10.0	108%	1.9%
cis-1,2-Dichloroethene	10.4	10.0	104%	10.8	10.0	108%	3.8%
Chloroform	10.8	10.0	108%	10.8	10.0	108%	0.0%
1,2-Dichloroethane	10.5	10.0	105%	10.6	10.0	106%	0.9%
2-Butanone	57.5	50.0	115%	59.0	50.0	118%	2.6%
1,1,1-Trichloroethane	10.8	10.0	108%	10.5	10.0	105%	2.8%
Carbon Tetrachloride	11.1	10.0	111%	11.3	10.0	113%	1.8%
Vinyl Acetate	11.4	10.0	114%	11.5	10.0	115%	0.9%
Bromodichloromethane	10.7	10.0	107%	10.9	10.0	109%	1.9%
1,2-Dichloropropane	10.5	10.0	105%	10.6	10.0	106%	0.9%
cis-1,3-Dichloropropene	10.8	10.0	108%	11.0	10.0	110%	1.8%
Trichloroethene	10.2	10.0	102%	10.5	10.0	105%	2.9%
Dibromochloromethane	10.3	10.0	103%	11.1	10.0	111%	7.5%
1,1,2-Trichloroethane	10.8	10.0	108%	11.0	10.0	110%	1.8%
Benzene	10.5	10.0	105%	10.6	10.0	106%	0.9%
trans-1,3-Dichloropropene	11.0	10.0	110%	11.0	10.0	110%	0.0%
2-Chloroethylvinylether	10.1	10.0	101%	10.4	10.0	104%	2.9%
Bromoform	10.1	10.0	101%	10.4	10.0	104%	2.9%
4-Methyl-2-Pentanone (MIBK)	52.8	50.0	106%	54.7	50.0	109%	3.5%
2-Hexanone	50.4	50.0	101%	54.3	50.0	109%	7.4%
Tetrachloroethene	9.26	10.0	92.6%	9.62	10.0	96.2%	3.8%
1,1,2,2-Tetrachloroethane	9.64	10.0	96.4%	10.0	10.0	100%	3.7%
Toluene	10.2	10.0	102%	10.4	10.0	104%	1.9%
Chlorobenzene	9.67	10.0	96.7%	9.93	10.0	99.3%	2.7%
Ethylbenzene	9.60	10.0	96.0%	10.0	10.0	100%	4.1%
Styrene	10.0	10.0	100%	10.3	10.0	103%	3.0%
Trichlorofluoromethane	10.4	10.0	104%	10.3	10.0	103%	1.0%
1,1,2-Trichloro-1,2,2-trifluoroethane	10.8	10.0	108%	10.3	10.0	103%	4.7%
m,p-Xylene	20.2	20.0	101%	20.5	20.0	102%	1.5%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 2 of 2

Sample ID: LCS-020816A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-020816A

LIMS ID: 16-1924

Matrix: Water

QC Report No: AVO7-The Boeing Company

Project: Boeing Apron A

Analyte	LCS	Spike		LCS	LCS	Spike		RPD
		Added-LCS	Recovery			Added-LCS	Recovery	
o-Xylene	9.56	10.0	95.6%	10.0	10.0	100%	4.5%	
1,2-Dichlorobenzene	9.47	10.0	94.7%	9.29	10.0	92.9%	1.9%	
1,3-Dichlorobenzene	9.78	10.0	97.8%	9.76	10.0	97.6%	0.2%	
1,4-Dichlorobenzene	9.60	10.0	96.0%	9.51	10.0	95.1%	0.9%	
Acrolein	55.0	50.0	110%	60.3	50.0	121%	9.2%	
Iodomethane	10.3	10.0	103%	10.5	10.0	105%	1.9%	
Bromoethane	10.7	10.0	107%	10.9	10.0	109%	1.9%	
Acrylonitrile	11.0	10.0	110%	11.5	10.0	115%	4.4%	
1,1-Dichloropropene	9.93	10.0	99.3%	10.0	10.0	100%	0.7%	
Dibromomethane	10.7	10.0	107%	11.0	10.0	110%	2.8%	
1,1,1,2-Tetrachloroethane	10.1	10.0	101%	10.9	10.0	109%	7.6%	
1,2-Dibromo-3-chloropropane	9.75	10.0	97.5%	9.93	10.0	99.3%	1.8%	
1,2,3-Trichloropropane	10.1	10.0	101%	10.4	10.0	104%	2.9%	
trans-1,4-Dichloro-2-butene	9.79	10.0	97.9%	10.4	10.0	104%	6.0%	
1,3,5-Trimethylbenzene	9.72	10.0	97.2%	9.75	10.0	97.5%	0.3%	
1,2,4-Trimethylbenzene	10.0	10.0	100%	9.91	10.0	99.1%	0.9%	
Hexachlorobutadiene	7.78 Q	10.0	77.8%	7.64 Q	10.0	76.4%	1.8%	
1,2-Dibromoethane	10.2	10.0	102%	10.7	10.0	107%	4.8%	
Bromochloromethane	10.6	10.0	106%	10.5	10.0	105%	0.9%	
2,2-Dichloropropane	10.9	10.0	109%	10.9	10.0	109%	0.0%	
1,3-Dichloropropane	9.64	10.0	96.4%	10.2	10.0	102%	5.6%	
Isopropylbenzene	9.80	10.0	98.0%	9.75	10.0	97.5%	0.5%	
n-Propylbenzene	9.91	10.0	99.1%	9.96	10.0	99.6%	0.5%	
Bromobenzene	9.54	10.0	95.4%	9.60	10.0	96.0%	0.6%	
2-Chlorotoluene	9.60	10.0	96.0%	9.68	10.0	96.8%	0.8%	
4-Chlorotoluene	9.91	10.0	99.1%	9.77	10.0	97.7%	1.4%	
tert-Butylbenzene	9.36	10.0	93.6%	9.47	10.0	94.7%	1.2%	
sec-Butylbenzene	9.85	10.0	98.5%	9.75	10.0	97.5%	1.0%	
4-Isopropyltoluene	9.72	10.0	97.2%	9.69	10.0	96.9%	0.3%	
n-Butylbenzene	9.66	10.0	96.6%	9.61	10.0	96.1%	0.5%	
1,2,4-Trichlorobenzene	8.62	10.0	86.2%	8.67	10.0	86.7%	0.6%	
Naphthalene	8.33 Q	10.0	83.3%	8.49 Q	10.0	84.9%	1.9%	
1,2,3-Trichlorobenzene	8.92	10.0	89.2%	9.22	10.0	92.2%	3.3%	

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d4-1,2-Dichloroethane	109%	107%
d8-Toluene	103%	101%
Bromofluorobenzene	95.4%	101%
d4-1,2-Dichlorobenzene	101%	96.2%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG

Sample ID: LCS-020816A

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LAB CONTROL SAMPLE

Lab Sample ID: LCS-020816A

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1923

Project: Boeing Apron A

Matrix: Water

Data Release Authorized: *AS*

Date Sampled: NA

Reported: 02/09/16

Date Received: NA

Instrument/Analyst LCS: NT3/PKC

Sample Amount LCS: 10.0 mL

LCSD: NT3/PKC

LCSD: 10.0 mL

Date Analyzed LCS: 02/08/16 14:35

Purge Volume LCS: 10.0 mL

LCSD: 02/08/16 15:01

LCSD: 10.0 mL

Analyte	LCS	Spike	LCS	LCS	Spike	LCSD	RPD
		Added-LCS	Recovery		Added-LCSD	Recovery	
Benzene	7.65	7.04	109%	7.65	7.04	109%	0.0%
Toluene	55.2	49.4	112%	54.9	49.4	111%	0.5%
Ethylbenzene	13.2	12.3	107%	13.1	12.3	107%	0.8%
m,p-Xylene	43.6	40.0	109%	43.7	40.0	109%	0.2%
o-Xylene	16.5	15.3	108%	16.7	15.3	109%	1.2%

Reported in µg/L (ppb)

Gasoline Range Hydrocarbons	1.04	1.00	104%	1.06	1.00	106%	1.9%
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Reported in mg/L (ppm)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d4-1,2-Dichloroethane	111%	111%
d8-Toluene	102%	97.8%
Bromofluorobenzene	94.6%	95.0%
d4-1,2-Dichlorobenzene	101%	102%




ORGANICS ANALYSIS DATA SHEET  
 TOTAL DIESEL RANGE HYDROCARBONS  
 NWTPHD by GC/FID  
 Extraction Method: SW3510C  
 Page 1 of 1

QC Report No: AV07-The Boeing Company  
 Project: Boeing Apron A

Matrix: Water

Date Received: 02/05/16

Data Release Authorized:   
 Reported: 02/10/16

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DF	Range/Surrogate	RL	Result
MB-020816	Method Blank	02/08/16	02/09/16	1.00	Diesel Range	0.10	< 0.10 U
16-1923	HC ID: ---		FID4A	1.0	Motor Oil Range o-Terphenyl	0.20	< 0.20 U 97.4%
AV07A	Apron-A-B-15-GW	02/09/16	02/09/16	1.00	Diesel Range	0.10	0.23
16-1923	HC ID: DIESEL		FID4A	1.0	Motor Oil Range o-Terphenyl	0.20	< 0.20 U 96.9%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.  
 DL-Dilution of extract prior to analysis.  
 RL-Reporting limit.

Diesel range quantitation on total peaks in the range from C12 to C24.  
 Motor Oil range quantitation on total peaks in the range from C24 to C38.  
 HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

**TPHD SURROGATE RECOVERY SUMMARY**

Matrix: Water

QC Report No: AV07-The Boeing Company  
Project: Boeing Apron A

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
MB-020816	97.4%	0
LCS-020816	98.9%	0
Apron-A-B-15-GW	96.9%	0

	<u>LCS/MB LIMITS</u>	<u>QC LIMITS</u>
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3510C  
Log Number Range: 16-1923 to 16-1923



ORGANICS ANALYSIS DATA SHEET  
 NWTPHD by GC/FID  
 Page 1 of 1

Sample ID: LCS-020816  
 LAB CONTROL

Lab Sample ID: LCS-020816  
 LIMS ID: 16-1923  
 Matrix: Water  
 Data Release Authorized: *[Signature]*  
 Reported: 02/10/16

QC Report No: AVO7-The Boeing Company  
 Project: Boeing Apron A  
 Date Sampled: NA  
 Date Received: NA

Date Extracted: 02/08/16  
 Date Analyzed: 02/09/16 18:52  
 Instrument/Analyst: FID4A/ML

Sample Amount: 500 mL  
 Final Extract Volume: 1.0 mL  
 Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.72	3.00	90.7%

**TPHD Surrogate Recovery**

o-Terphenyl	98.9%
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Results reported in mg/L

**TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT**

Matrix: Water  
Date Received: 02/05/16

ARI Job: AVO7  
Project: Boeing Apron A


ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
16-1923-020816MB1	Method Blank	500 mL	1.00 mL	02/08/16
16-1923-020816LCS1	Lab Control	500 mL	1.00 mL	02/08/16
16-1923-AVO7A	Apron-A-B-15-GW	500 mL	1.00 mL	02/09/16

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-15-GW  
SAMPLE

Lab Sample ID: AV07A  
LIMS ID: 16-1923  
Matrix: Water  
Data Release Authorized:   
Reported: 02/10/16

QC Report No: AV07-The Boeing Company  
Project: Boeing Apron A

Date Sampled: 02/05/16  
Date Received: 02/05/16

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
3010A	02/09/16	6010C	02/09/16	7429-90-5	Aluminum	0.2	245	
3010A	02/09/16	6010C	02/09/16	7440-38-2	Arsenic	0.2	0.2	U
3010A	02/09/16	6010C	02/09/16	7440-39-3	Barium	0.02	1.29	
3010A	02/09/16	6010C	02/09/16	7440-43-9	Cadmium	0.01	0.01	U
3010A	02/09/16	6010C	02/09/16	7440-70-2	Calcium	0.2	164	
3010A	02/09/16	6010C	02/09/16	7440-47-3	Chromium	0.02	0.45	
3010A	02/09/16	6010C	02/09/16	7440-48-4	Cobalt	0.02	0.18	
3010A	02/09/16	6010C	02/09/16	7440-50-8	Copper	0.01	0.25	
3010A	02/09/16	6010C	02/09/16	7439-89-6	Iron	0.2	579	
3010A	02/09/16	6010C	02/09/16	7439-92-1	Lead	0.1	0.1	U
3010A	02/09/16	6010C	02/09/16	7439-95-4	Magnesium	0.2	102	
3010A	02/09/16	6010C	02/09/16	7439-98-7	Molybdenum	0.02	0.02	U
3010A	02/09/16	6010C	02/09/16	7440-02-0	Nickel	0.05	0.41	
3010A	02/09/16	6010C	02/09/16	7440-22-4	Silver	0.02	0.02	U
3010A	02/09/16	6010C	02/09/16	7440-66-6	Zinc	0.05	0.66	

U-Analyte undetected at given LOQ  
LOQ-Reporting Limit

INORGANICS ANALYSIS DATA SHEET  
DISSOLVED METALS  
Page 1 of 1

Sample ID: Apron-A-B-15-020516  
SAMPLE

Lab Sample ID: AV07C  
LIMS ID: 16-1925  
Matrix: Water  
Data Release Authorized:  
Reported: 02/10/16

QC Report No: AV07-The Boeing Company  
Project: Boeing Apron A  
Date Sampled: 02/05/16  
Date Received: 02/05/16

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
6010C	02/09/16	6010C	02/09/16	7429-90-5	Aluminum	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	7440-38-2	Arsenic	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	<b>7440-39-3</b>	<b>Barium</b>	0.003	<b>0.070</b>	
6010C	02/09/16	6010C	02/09/16	7440-43-9	Cadmium	0.002	0.002	U
6010C	02/09/16	6010C	02/09/16	<b>7440-70-2</b>	<b>Calcium</b>	0.05	<b>65.8</b>	
6010C	02/09/16	6010C	02/09/16	7440-47-3	Chromium	0.005	0.005	U
6010C	02/09/16	6010C	02/09/16	<b>7440-48-4</b>	<b>Cobalt</b>	0.003	<b>0.004</b>	
6010C	02/09/16	6010C	02/09/16	7440-50-8	Copper	0.002	0.002	U
6010C	02/09/16	6010C	02/09/16	<b>7439-89-6</b>	<b>Iron</b>	0.05	<b>82.3</b>	
6010C	02/09/16	6010C	02/09/16	7439-92-1	Lead	0.02	0.02	U
6010C	02/09/16	6010C	02/09/16	<b>7439-95-4</b>	<b>Magnesium</b>	0.05	<b>26.1</b>	
6010C	02/09/16	6010C	02/09/16	<b>7439-98-7</b>	<b>Molybdenum</b>	0.005	<b>0.011</b>	
6010C	02/09/16	6010C	02/09/16	7440-02-0	Nickel	0.01	0.01	U
6010C	02/09/16	6010C	02/09/16	7440-22-4	Silver	0.003	0.003	U
6010C	02/09/16	6010C	02/09/16	<b>7440-66-6</b>	<b>Zinc</b>	0.01	<b>0.02</b>	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

**Sample ID: METHOD BLANK**

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Lab Sample ID: AVO7MB

QC Report No: AVO7-The Boeing Company

LIMS ID: 16-1923

Project: Boeing Apron A

Matrix: Water

Data Release Authorized: 

Date Sampled: NA

Reported: 02/10/16

Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
3010A	02/09/16	6010C	02/09/16	7429-90-5	Aluminum	0.05	0.05	U
3010A	02/09/16	6010C	02/09/16	7440-38-2	Arsenic	0.05	0.05	U
3010A	02/09/16	6010C	02/09/16	7440-39-3	Barium	0.003	0.003	U
3010A	02/09/16	6010C	02/09/16	7440-43-9	Cadmium	0.002	0.002	U
3010A	02/09/16	6010C	02/09/16	7440-70-2	Calcium	0.05	0.05	U
3010A	02/09/16	6010C	02/09/16	7440-47-3	Chromium	0.005	0.005	U
3010A	02/09/16	6010C	02/09/16	7440-48-4	Cobalt	0.003	0.003	U
3010A	02/09/16	6010C	02/09/16	7440-50-8	Copper	0.002	0.002	U
3010A	02/09/16	6010C	02/09/16	7439-89-6	Iron	0.05	0.05	U
3010A	02/09/16	6010C	02/09/16	7439-92-1	Lead	0.02	0.02	U
3010A	02/09/16	6010C	02/09/16	7439-95-4	Magnesium	0.05	0.05	U
3010A	02/09/16	6010C	02/09/16	7439-98-7	Molybdenum	0.005	0.005	U
3010A	02/09/16	6010C	02/09/16	7440-02-0	Nickel	0.01	0.01	U
3010A	02/09/16	6010C	02/09/16	7440-22-4	Silver	0.003	0.003	U
3010A	02/09/16	6010C	02/09/16	7440-66-6	Zinc	0.01	0.01	U

U-Analyte undetected at given LOQ  
LOQ-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: AV07LCS

LIMS ID: 16-1923

Matrix: Water

Data Release Authorized: *EA*

Reported: 02/10/16

QC Report No: AV07-The Boeing Company

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2.08	2.00	104%	
Arsenic	6010C	2.08	2.00	104%	
Barium	6010C	2.01	2.00	100%	
Cadmium	6010C	0.513	0.500	103%	
Calcium	6010C	9.76	10.0	97.6%	
Chromium	6010C	0.504	0.500	101%	
Cobalt	6010C	0.491	0.500	98.2%	
Copper	6010C	0.498	0.500	99.6%	
Iron	6010C	2.10	2.00	105%	
Lead	6010C	2.09	2.00	104%	
Magnesium	6010C	10.5	10.0	105%	
Molybdenum	6010C	0.497	0.500	99.4%	
Nickel	6010C	0.53	0.50	106%	
Silver	6010C	0.539	0.500	108%	
Zinc	6010C	0.51	0.50	102%	

Reported in mg/L

N-Control limit not met

Control Limits: 80-120%

**INORGANICS ANALYSIS DATA SHEET**

**DISSOLVED METALS**

Sample ID: METHOD BLANK

Page 1 of 1


Lab Sample ID: AV07MB

QC Report No: AV07-The Boeing Company

LIMS ID: 16-1925

Project: Boeing Apron A

Matrix: Water

Data Release Authorized: 

Date Sampled: NA

Reported: 02/10/16

Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
6010C	02/09/16	6010C	02/09/16	7429-90-5	Aluminum	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	7440-38-2	Arsenic	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	7440-39-3	Barium	0.003	0.003	U
6010C	02/09/16	6010C	02/09/16	7440-43-9	Cadmium	0.002	0.002	U
6010C	02/09/16	6010C	02/09/16	7440-70-2	Calcium	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	7440-47-3	Chromium	0.005	0.005	U
6010C	02/09/16	6010C	02/09/16	7440-48-4	Cobalt	0.003	0.003	U
6010C	02/09/16	6010C	02/09/16	7440-50-8	Copper	0.002	0.002	U
6010C	02/09/16	6010C	02/09/16	7439-89-6	Iron	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	7439-92-1	Lead	0.02	0.02	U
6010C	02/09/16	6010C	02/09/16	7439-95-4	Magnesium	0.05	0.05	U
6010C	02/09/16	6010C	02/09/16	7439-98-7	Molybdenum	0.005	0.005	U
6010C	02/09/16	6010C	02/09/16	7440-02-0	Nickel	0.01	0.01	U
6010C	02/09/16	6010C	02/09/16	7440-22-4	Silver	0.003	0.003	U
6010C	02/09/16	6010C	02/09/16	7440-66-6	Zinc	0.01	0.01	U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**  
**DISSOLVED METALS**  
 Page 1 of 1

**Sample ID: LAB CONTROL**

Lab Sample ID: AVO7LCS  
 LIMS ID: 16-1925  
 Matrix: Water  
 Data Release Authorized: *OF*  
 Reported: 02/10/16

QC Report No: AVO7-The Boeing Company  
 Project: Boeing Apron A  
 Date Sampled: NA  
 Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2.14	2.00	107%	
Arsenic	6010C	2.24	2.00	112%	
Barium	6010C	2.06	2.00	103%	
Cadmium	6010C	0.558	0.500	112%	
Calcium	6010C	10.1	10.0	101%	
Chromium	6010C	0.518	0.500	104%	
Cobalt	6010C	0.516	0.500	103%	
Copper	6010C	0.512	0.500	102%	
Iron	6010C	2.16	2.00	108%	
Lead	6010C	2.22	2.00	111%	
Magnesium	6010C	10.8	10.0	108%	
Molybdenum	6010C	0.522	0.500	104%	
Nickel	6010C	0.54	0.50	108%	
Silver	6010C	0.565	0.500	113%	
Zinc	6010C	0.53	0.50	106%	

Reported in mg/L

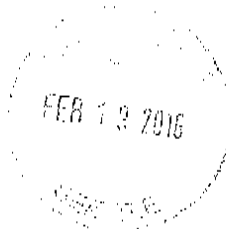
N-Control limit not met  
 Control Limits: 80-120%



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

February 11, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101



**RE: Project: Boeing Renton Apron A**  
**ARI Job: AVO9**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted four soil samples and a trip blank in good condition on February 5, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for Total Metals, VOCs, NWTPH-Dx and NWTPH-Gx, as requested on the COC.

The VOCs CCAL is out of control low for all associated FORM III "Q" flagged analytes with the exception of trichlorofluoromethane which is out of control high. All associated samples that contain analyte have been flagged with a "Q" qualifier.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Kelly Bottem  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: AV009 Turn-around Requested: 5-days Page: 1 of 1

ARI Client Company: AMEC Phone: 206-459-8220 Date: 2/5/16 Ice Present? Yes

Client Contact: Cristal Thimsen Cooler Temps: 3.5°C

Client Project Name: Boeing Apron A No. of Coolers: 1

Client Project #: J. Bellamy

Samplers: J. Bellamy

Sample ID	Date	Time	Matrix	No. Containers	VOC	TPH-G	TPH-BOD	TPH-DLL	TPH-SLURRY	Analysis Requested	Notes/Comments
Apron-A-19-020516	2/5/16	8:50	Soil	8	X	X	X	X	X	Hold	
Apron-A-19-020516	2/5/16	9:15	Soil	8	X	X	X	X	X		
Apron-A-19-020516	2/5/16	11:55	Soil	8	X	X	X	X	X		
Apron-A-19-020516	2/5/16	12:10	Soil	8	X	X	X	X	X		
Trip blank 020516	2/5/16	—	—	—	X	X	X	X	X		

Comments/Special Instructions: \*Hole Per. TPT-Dr with silica gel, succ., pres. TCEP markers

Received by: Jennifer Bellamy (Signature) Relinquished by: Tyler Rankin (Signature)

Printed Name: Jennifer Bellamy Company: AMEC Foster Wheeler Printed Name: Tyler Rankin Company: ARI

Date & Time: 2/5/16 1519 Date & Time: 2-5-16 1519

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated  
Analytical Chemists and Consultants  
4611 South 134th Place, Suite 100  
Tukwila, WA 98168  
206-695-6200 206-695-6201 (fax)  
www.arilabs.com



# Sample ID Cross Reference Report



ARI Job No: AVO9  
Client: Boeing  
Project Event: Boeing Apron A  
Project Name: N/A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron-A-B-19-020516	AVO9A	16-1928	Soil	02/05/16 08:50	02/05/16 15:19
2. Apron-A-B-20-020516	AVO9B	16-1929	Soil	02/05/16 09:15	02/05/16 15:19
3. Apron-A-B-15-0-5-020516	AVO9C	16-1930	Soil	02/05/16 11:55	02/05/16 15:19
4. Apron-A-B-15-6-12-020516	AVO9D	16-1931	Soil	02/05/16 12:10	02/05/16 15:19
5. Apron-A-B-19-020516	AVO9E	16-1932	Soil	02/05/16 08:50	02/05/16 15:19
6. Apron-A-B-20-020516	AVO9F	16-1933	Soil	02/05/16 09:15	02/05/16 15:19
7. Apron-A-B-15-0-5-020516	AVO9G	16-1934	Soil	02/05/16 11:55	02/05/16 15:19
8. Apron-A-B-15-6-12-020516	AVO9H	16-1935	Soil	02/05/16 12:10	02/05/16 15:19



# Cooler Receipt Form

ARI Client: AMEC

Project Name: Boeing Apron A

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: AV09

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES  NO

Were custody papers included with the cooler? ..... YES  NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.5

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: P005276

Cooler Accepted by: TR Date: 2-5-16 Time: 1519

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES  NO

What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA  YES  NO

Were all bottles sealed in individual plastic bags? ..... YES  NO

Did all bottles arrive in good condition (unbroken)? ..... YES  NO

Were all bottle labels complete and legible? ..... YES  NO

Did the number of containers listed on COC match with the number of containers received? ..... YES  NO

Did all bottle labels and tags agree with custody papers? ..... YES  NO

Were all bottles used correct for the requested analyses? ..... YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES  NO

Were all VOC vials free of air bubbles? ..... NA YES  NO

Was sufficient amount of sample sent in each bottle? ..... YES  NO

Date VOC Trip Blank was made at ARI: ..... NA

Was Sample Split by ARI: NA YES  Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: CA Date: 2/8/16 Time: 1032

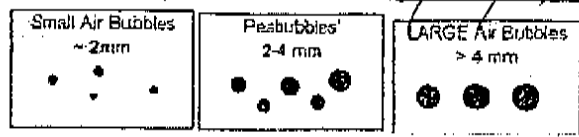
**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

~~NO TRIP BLANKS~~ NO Trip Blanks received.  
CA

By: CA Date: 2/8/16



- Small → "sm" (< 2 mm)
- Peabubbles → "pb" (2 to < 4 mm)
- Large → "lg" (4 to < 6 mm)
- Headspace → "hs" (> 6 mm)

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: Apron-A-B-19-020516

SAMPLE

Lab Sample ID: AVO9A

QC Report No: AVO9-Boeing

LIMS ID: 16-1928

Project: Boeing Apron A

Matrix: Soil

Data Release Authorized: *[Signature]*

Date Sampled: 02/05/16

Reported: 02/10/16

Date Received: 02/05/16

Instrument/Analyst: NT5/PAB

Sample Amount: 4.64 g-dry-wt

Date Analyzed: 02/09/16 16:52

Purge Volume: 5.0 mL

Moisture: 25.6%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.1	< 1.1	U
74-83-9	Bromomethane	1.1	< 1.1	U
75-01-4	Vinyl Chloride	1.1	< 1.1	U
75-00-3	Chloroethane	1.1	< 1.1	U
75-09-2	Methylene Chloride	2.2	< 2.2	U
<b>67-64-1</b>	<b>Acetone</b>	<b>5.4</b>	<b>10</b>	
75-15-0	Carbon Disulfide	1.1	< 1.1	U
75-35-4	1,1-Dichloroethene	1.1	< 1.1	U
75-34-3	1,1-Dichloroethane	1.1	< 1.1	U
156-60-5	trans-1,2-Dichloroethene	1.1	< 1.1	U
156-59-2	cis-1,2-Dichloroethene	1.1	< 1.1	U
67-66-3	Chloroform	1.1	< 1.1	U
107-06-2	1,2-Dichloroethane	1.1	< 1.1	U
78-93-3	2-Butanone	5.4	< 5.4	U
71-55-6	1,1,1-Trichloroethane	1.1	< 1.1	U
56-23-5	Carbon Tetrachloride	1.1	< 1.1	U
108-05-4	Vinyl Acetate	5.4	< 5.4	U
75-27-4	Bromodichloromethane	1.1	< 1.1	U
78-87-5	1,2-Dichloropropane	1.1	< 1.1	U
10061-01-5	cis-1,3-Dichloropropene	1.1	< 1.1	U
79-01-6	Trichloroethene	1.1	< 1.1	U
124-48-1	Dibromochloromethane	1.1	< 1.1	U
79-00-5	1,1,2-Trichloroethane	1.1	< 1.1	U
71-43-2	Benzene	1.1	< 1.1	U
10061-02-6	trans-1,3-Dichloropropene	1.1	< 1.1	U
110-75-8	2-Chloroethylvinylether	5.4	< 5.4	U
75-25-2	Bromoform	1.1	< 1.1	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.4	< 5.4	U
591-78-6	2-Hexanone	5.4	< 5.4	U
127-18-4	Tetrachloroethene	1.1	< 1.1	U
79-34-5	1,1,2,2-Tetrachloroethane	1.1	< 1.1	U
108-88-3	Toluene	1.1	< 1.1	U
108-90-7	Chlorobenzene	1.1	< 1.1	U
100-41-4	Ethylbenzene	1.1	< 1.1	U
100-42-5	Styrene	1.1	< 1.1	U
75-69-4	Trichlorofluoromethane	1.1	< 1.1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.2	< 2.2	U
179601-23-1	m,p-Xylene	1.1	< 1.1	U
95-47-6	o-Xylene	1.1	< 1.1	U
95-50-1	1,2-Dichlorobenzene	1.1	< 1.1	U
541-73-1	1,3-Dichlorobenzene	1.1	< 1.1	U
106-46-7	1,4-Dichlorobenzene	1.1	< 1.1	U
107-02-8	Acrolein	5.4	< 5.4	U
74-88-4	Iodomethane	1.1	< 1.1	U
74-96-4	Bromoethane	2.2	< 2.2	U
107-13-1	Acrylonitrile	5.4	< 5.4	U
563-58-6	1,1-Dichloropropene	1.1	< 1.1	U
74-95-3	Dibromomethane	1.1	< 1.1	U
630-20-6	1,1,1,2-Tetrachloroethane	1.1	< 1.1	U
96-12-8	1,2-Dibromo-3-chloropropane	5.4	< 5.4	U
96-18-4	1,2,3-Trichloropropane	2.2	< 2.2	U
110-57-6	trans-1,4-Dichloro-2-butene	5.4	< 5.4	U
108-67-8	1,3,5-Trimethylbenzene	1.1	< 1.1	U

Lab Sample ID: AVO9A  
 LIMS ID: 16-1928  
 Matrix: Soil  
 Date Analyzed: 02/09/16 16:52

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.1	< 1.1	U
87-68-3	Hexachlorobutadiene	5.4	< 5.4	U
106-93-4	1,2-Dibromoethane	1.1	< 1.1	U
74-97-5	Bromochloromethane	1.1	< 1.1	U
594-20-7	2,2-Dichloropropane	1.1	< 1.1	U
142-28-9	1,3-Dichloropropane	1.1	< 1.1	U
98-82-0	Isopropylbenzene	1.1	< 1.1	U
103-65-1	n-Propylbenzene	1.1	< 1.1	U
108-86-1	Bromobenzene	1.1	< 1.1	U
95-49-8	2-Chlorotoluene	1.1	< 1.1	U
106-43-4	4-Chlorotoluene	1.1	< 1.1	U
98-06-6	tert-Butylbenzene	1.1	< 1.1	U
135-98-8	sec-Butylbenzene	1.1	< 1.1	U
99-87-6	4-Isopropyltoluene	1.1	< 1.1	U
104-51-8	n-Butylbenzene	1.1	< 1.1	U
120-82-1	1,2,4-Trichlorobenzene	5.4	< 5.4	U
91-20-3	Naphthalene	5.4	< 5.4	U
87-61-6	1,2,3-Trichlorobenzene	5.4	< 5.4	U

Reported in µg/kg (ppb)

**Volatiles Surrogate Recovery**

d4-1,2-Dichloroethane	128%
d8-Toluene	104%
Bromofluorobenzene	99.7%
d4-1,2-Dichlorobenzene	106%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B-20-020516  
SAMPLE

Lab Sample ID: AVO9B  
LIMS ID: 16-1929  
Matrix: Soil  
Data Release Authorized: *[Signature]*  
Reported: 02/10/16

QC Report No: AVO9-Boeing  
Project: Boeing Apron A

Date Sampled: 02/05/16  
Date Received: 02/05/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 02/09/16 17:15

Sample Amount: 5.00 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 21.3%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
<b>67-64-1</b>	<b>Acetone</b>	<b>5.0</b>	<b>29</b>	
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>5.0</b>	<b>5.5</b>	<b>M</b>
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	130	< 130	Y
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
<b>107-02-8</b>	<b>Acrolein</b>	<b>5.0</b>	<b>11</b>	<b>M</b>
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

Lab Sample ID: AVO9B  
 LIMS ID: 16-1929  
 Matrix: Soil  
 Date Analyzed: 02/09/16 17:15

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in ug/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	130%
d8-Toluene	104%
Bromofluorobenzene	93.3%
d4-1,2-Dichlorobenzene	104%

Lab Sample ID: AVO9C  
 LIMS ID: 16-1930  
 Matrix: Soil  
 Data Release Authorized: *[Signature]*  
 Reported: 02/10/16

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

Date Sampled: 02/05/16  
 Date Received: 02/05/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 02/09/16 17:38

Sample Amount: 5.39 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 17.7%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.9	< 0.9	U
74-83-9	Bromomethane	0.9	< 0.9	U
75-01-4	Vinyl Chloride	0.9	< 0.9	U
75-00-3	Chloroethane	0.9	< 0.9	U
75-09-2	Methylene Chloride	1.9	< 1.9	U
<b>67-64-1</b>	<b>Acetone</b>	<b>4.6</b>	<b>10</b>	
75-15-0	Carbon Disulfide	0.9	< 0.9	U
75-35-4	1,1-Dichloroethene	0.9	< 0.9	U
75-34-3	1,1-Dichloroethane	0.9	< 0.9	U
156-60-5	trans-1,2-Dichloroethene	0.9	< 0.9	U
<b>156-59-2</b>	<b>cis-1,2-Dichloroethene</b>	<b>0.9</b>	<b>2.9</b>	
67-66-3	Chloroform	0.9	< 0.9	U
107-06-2	1,2-Dichloroethane	0.9	< 0.9	U
78-93-3	2-Butanone	4.6	< 4.6	U
71-55-6	1,1,1-Trichloroethane	0.9	< 0.9	U
56-23-5	Carbon Tetrachloride	0.9	< 0.9	U
108-05-4	Vinyl Acetate	4.6	< 4.6	U
75-27-4	Bromodichloromethane	0.9	< 0.9	U
78-87-5	1,2-Dichloropropane	0.9	< 0.9	U
10061-01-5	cis-1,3-Dichloropropene	0.9	< 0.9	U
79-01-6	Trichloroethene	0.9	< 0.9	U
124-48-1	Dibromochloromethane	0.9	< 0.9	U
79-00-5	1,1,2-Trichloroethane	0.9	< 0.9	U
71-43-2	Benzene	0.9	< 0.9	U
10061-02-6	trans-1,3-Dichloropropene	0.9	< 0.9	U
110-75-8	2-Chloroethylvinylether	4.6	< 4.6	U
75-25-2	Bromoform	0.9	< 0.9	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	4.6	< 4.6	U
591-78-6	2-Hexanone	4.6	< 4.6	U
127-18-4	Tetrachloroethene	0.9	< 0.9	U
79-34-5	1,1,2,2-Tetrachloroethane	0.9	< 0.9	U
108-88-3	Toluene	0.9	< 0.9	U
108-90-7	Chlorobenzene	0.9	< 0.9	U
100-41-4	Ethylbenzene	0.9	< 0.9	U
100-42-5	Styrene	0.9	< 0.9	U
75-69-4	Trichlorofluoromethane	0.9	< 0.9	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.9	< 1.9	U
179601-23-1	m,p-Xylene	0.9	< 0.9	U
95-47-6	o-Xylene	0.9	< 0.9	U
95-50-1	1,2-Dichlorobenzene	0.9	< 0.9	U
541-73-1	1,3-Dichlorobenzene	0.9	< 0.9	U
106-46-7	1,4-Dichlorobenzene	0.9	< 0.9	U
107-02-8	Acrolein	4.6	< 4.6	U
74-88-4	Iodomethane	0.9	< 0.9	U
74-96-4	Bromoethane	1.9	< 1.9	U
107-13-1	Acrylonitrile	4.6	< 4.6	U
563-58-6	1,1-Dichloropropene	0.9	< 0.9	U
74-95-3	Dibromomethane	0.9	< 0.9	U
630-20-6	1,1,1,2-Tetrachloroethane	0.9	< 0.9	U
96-12-8	1,2-Dibromo-3-chloropropane	4.6	< 4.6	U
96-18-4	1,2,3-Trichloropropane	1.9	< 1.9	U
110-57-6	trans-1,4-Dichloro-2-butene	4.6	< 4.6	U
108-67-8	1,3,5-Trimethylbenzene	0.9	< 0.9	U

Lab Sample ID: AVO9C  
 LIMS ID: 16-1930  
 Matrix: Soil  
 Date Analyzed: 02/09/16 17:38


QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	0.9	< 0.9	U
87-68-3	Hexachlorobutadiene	4.6	< 4.6	U
106-93-4	1,2-Dibromoethane	0.9	< 0.9	U
74-97-5	Bromochloromethane	0.9	< 0.9	U
594-20-7	2,2-Dichloropropane	0.9	< 0.9	U
142-28-9	1,3-Dichloropropane	0.9	< 0.9	U
98-82-8	Isopropylbenzene	0.9	< 0.9	U
103-65-1	n-Propylbenzene	0.9	< 0.9	U
108-86-1	Bromobenzene	0.9	< 0.9	U
95-49-9	2-Chlorotoluene	0.9	< 0.9	U
106-43-4	4-Chlorotoluene	0.9	< 0.9	U
98-06-6	tert-Butylbenzene	0.9	< 0.9	U
135-98-8	sec-Butylbenzene	0.9	< 0.9	U
99-87-6	4-Isopropyltoluene	0.9	< 0.9	U
104-51-8	n-Butylbenzene	0.9	< 0.9	U
120-82-1	1,2,4-Trichlorobenzene	4.6	< 4.6	U
91-20-3	Naphthalene	4.6	< 4.6	U
87-61-6	1,2,3-Trichlorobenzene	4.6	< 4.6	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	130%
d8-Toluene	104%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	105%

Lab Sample ID: AVO9D  
 LIMS ID: 16-1931  
 Matrix: Soil  
 Data Release Authorized:   
 Reported: 02/10/16

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

Date Sampled: 02/05/16  
 Date Received: 02/05/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 02/09/16 18:00

Sample Amount: 3.04 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 36.9%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.6	< 1.6	U
74-83-9	Bromomethane	1.6	< 1.6	U
75-01-4	Vinyl Chloride	1.6	< 1.6	U
75-00-3	Chloroethane	1.6	< 1.6	U
75-09-2	Methylene Chloride	3.3	< 3.3	U
<b>67-64-1</b>	<b>Acetone</b>	<b>8.2</b>	<b>42</b>	
<b>75-15-0</b>	<b>Carbon Disulfide</b>	<b>1.6</b>	<b>3.1</b>	
75-35-4	1,1-Dichloroethene	1.6	< 1.6	U
75-34-3	1,1-Dichloroethane	1.6	< 1.6	U
156-60-5	trans-1,2-Dichloroethene	1.6	< 1.6	U
156-59-2	cis-1,2-Dichloroethene	1.6	< 1.6	U
67-66-3	Chloroform	1.6	< 1.6	U
107-06-2	1,2-Dichloroethane	1.6	< 1.6	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>8.2</b>	<b>9.2</b>	
71-55-6	1,1,1-Trichloroethane	1.6	< 1.6	U
56-23-5	Carbon Tetrachloride	1.6	< 1.6	U
108-05-4	Vinyl Acetate	8.2	< 8.2	U
75-27-4	Bromodichloromethane	1.6	< 1.6	U
78-87-5	1,2-Dichloropropane	1.6	< 1.6	U
10061-01-5	cis-1,3-Dichloropropene	1.6	< 1.6	U
79-01-6	Trichloroethene	1.6	< 1.6	U
124-48-1	Dibromochloromethane	1.6	< 1.6	U
79-00-5	1,1,2-Trichloroethane	1.6	< 1.6	U
71-43-2	Benzene	1.6	< 1.6	U
10061-02-6	trans-1,3-Dichloropropene	1.6	< 1.6	U
110-75-8	2-Chloroethylvinylether	8.2	< 8.2	U
75-25-2	Bromoform	1.6	< 1.6	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	8.2	< 8.2	U
591-78-6	2-Hexanone	8.2	< 8.2	U
127-18-4	Tetrachloroethene	1.6	< 1.6	U
79-34-5	1,1,2,2-Tetrachloroethane	1.6	< 1.6	U
108-88-3	Toluene	1.6	< 1.6	U
108-90-7	Chlorobenzene	1.6	< 1.6	U
100-41-4	Ethylbenzene	1.6	< 1.6	U
100-42-5	Styrene	1.6	< 1.6	U
75-69-4	Trichlorofluoromethane	1.6	< 1.6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.3	< 3.3	U
179601-23-1	m,p-Xylene	1.6	< 1.6	U
95-47-6	o-Xylene	1.6	< 1.6	U
95-50-1	1,2-Dichlorobenzene	1.6	< 1.6	U
541-73-1	1,3-Dichlorobenzene	1.6	< 1.6	U
106-46-7	1,4-Dichlorobenzene	1.6	< 1.6	U
107-02-8	Acrolein	8.2	< 8.2	U
74-88-4	Iodomethane	1.6	< 1.6	U
74-96-4	Bromoethane	3.3	< 3.3	U
107-13-1	Acrylonitrile	8.2	< 8.2	U
563-58-6	1,1-Dichloropropene	1.6	< 1.6	U
74-95-3	Dibromomethane	1.6	< 1.6	U
630-20-6	1,1,1,2-Tetrachloroethane	1.6	< 1.6	U
96-12-8	1,2-Dibromo-3-chloropropane	8.2	< 8.2	U
96-18-4	1,2,3-Trichloropropane	3.3	< 3.3	U
110-57-6	trans-1,4-Dichloro-2-butene	8.2	< 8.2	U
108-67-8	1,3,5-Trimethylbenzene	1.6	< 1.6	U

Lab Sample ID: AV09D  
 LIMS ID: 16-1931  
 Matrix: Soil  
 Date Analyzed: 02/09/16 18:00

QC Report No: AV09-Boeing  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.6	< 1.6	U
87-68-3	Hexachlorobutadiene	8.2	< 8.2	U
106-93-4	1,2-Dibromoethane	1.6	< 1.6	U
74-97-5	Bromochloromethane	1.6	< 1.6	U
594-20-7	2,2-Dichloropropane	1.6	< 1.6	U
142-28-9	1,3-Dichloropropane	1.6	< 1.6	U
98-82-8	Isopropylbenzene	1.6	< 1.6	U
103-65-1	n-Propylbenzene	1.6	< 1.6	U
108-86-1	Bromobenzene	1.6	< 1.6	U
95-49-8	2-Chlorotoluene	1.6	< 1.6	U
106-43-4	4-Chlorotoluene	1.6	< 1.6	U
98-06-6	tert-Butylbenzene	1.6	< 1.6	U
135-98-8	sec-Butylbenzene	1.6	< 1.6	U
99-87-6	4-Isopropyltoluene	1.6	< 1.6	U
104-51-8	n-Butylbenzene	1.6	< 1.6	U
120-82-1	1,2,4-Trichlorobenzene	8.2	< 8.2	U
91-20-3	Naphthalene	8.2	< 8.2	U
87-61-6	1,2,3-Trichlorobenzene	8.2	< 8.2	U

Reported in µg/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	122%
d8-Toluene	104%
Bromofluorobenzene	96.4%
d4-1,2-Dichlorobenzene	105%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: MB-020916A

METHOD BLANK

Lab Sample ID: MB-020916A

QC Report No: AVO9-Boeing

LIMS ID: 16-1928

Project: Boeing Apron A

Matrix: Soil

Data Release Authorized: *[Signature]*

Date Sampled: NA

Reported: 02/10/16

Date Received: NA

Instrument/Analyst: NT5/PAB

Sample Amount: 5.00 g-dry-wt

Date Analyzed: 02/09/16 11:33

Purge Volume: 5.0 mL

Moisture: NA

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

Lab Sample ID: MB-020916A  
 LIMS ID: 16-1928  
 Matrix: Soil  
 Date Analyzed: 02/09/16 11:33

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-7	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	114%
d8-Toluene	104%
Bromofluorobenzene	94.7%
d4-1,2-Dichlorobenzene	102%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AVO9-Boeing  
Project: Boeing Apron A

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-020916A	Method Blank	Low	114%	104%	94.7%	102%	0
LCS-020916A	Lab Control	Low	115%	103%	96.2%	103%	0
LCSD-020916A	Lab Control Dup	Low	117%	104%	97.0%	102%	0
AVO9A	Apron-A-B-19-020516	Low	128%	104%	99.7%	106%	0
AVO9B	Apron-A-B-20-020516	Low	130%	104%	93.3%	104%	0
AVO9C	Apron-A-B-15-0-5-020516	Low	130%	104%	101%	105%	0
AVO9D	Apron-A-B-15-6-12-020516	Low	122%	104%	96.4%	105%	0


LCS/MB LIMITS

QC LIMITS

SWB260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	80-149	80-124
(TOL) = d8-Toluene	77-120	80-120	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 16-1928 to 16-1931

Sample ID: LCS-020916A  
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-020916A  
 LIMS ID: 16-1928  
 Matrix: Soil  
 Data Release Authorized:   
 Reported: 02/10/16

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

Date Sampled: NA  
 Date Received: NA

Instrument/Analyst LCS: NT5/PAB  
 LCSD: NT5/PAB  
 Date Analyzed LCS: 02/09/16 11:10  
 LCSD: 02/09/16 12:20

Sample Amount LCS: 5.00 g-dry-wt  
 LCSD: 5.00 g-dry-wt  
 Purge Volume LCS: 5.0 mL  
 LCSD: 5.0 mL  
 Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	54.8	50.0	110%	57.1	50.0	114%	4.1%
Bromomethane	56.6	50.0	113%	61.5	50.0	123%	8.3%
Vinyl Chloride	56.1	50.0	112%	58.6	50.0	117%	4.4%
Chloroethane	55.5	50.0	111%	58.1	50.0	116%	4.6%
Methylene Chloride	50.6	50.0	101%	52.6	50.0	105%	3.9%
Acetone	240	250	96.0%	234	250	93.6%	2.5%
Carbon Disulfide	57.9	50.0	116%	60.8	50.0	122%	4.9%
1,1-Dichloroethene	58.9	50.0	118%	61.9	50.0	124%	5.0%
1,1-Dichloroethane	54.6	50.0	109%	56.7	50.0	113%	3.8%
trans-1,2-Dichloroethene	58.8	50.0	118%	61.5	50.0	123%	4.5%
cis-1,2-Dichloroethene	56.2	50.0	112%	59.1	50.0	118%	5.0%
Chloroform	56.7	50.0	113%	59.5	50.0	119%	4.8%
1,2-Dichloroethane	42.6	50.0	85.2%	42.4	50.0	84.8%	0.5%
2-Butanone	294	250	118%	280	250	112%	4.9%
1,1,1-Trichloroethane	59.2	50.0	118%	61.0	50.0	122%	3.0%
Carbon Tetrachloride	50.8	50.0	102%	53.1	50.0	106%	4.4%
Vinyl Acetate	56.4	50.0	113%	56.1	50.0	112%	0.5%
Bromodichloromethane	46.4	50.0	92.8%	47.3	50.0	94.6%	1.9%
1,2-Dichloropropane	43.6	50.0	87.2%	44.8	50.0	89.6%	2.7%
cis-1,3-Dichloropropene	46.4	50.0	92.8%	46.6	50.0	93.2%	0.4%
Trichloroethene	46.5	50.0	93.0%	48.6	50.0	97.2%	4.4%
Dibromochloromethane	46.8	50.0	93.6%	45.6	50.0	91.2%	2.6%
1,1,2-Trichloroethane	46.2	50.0	92.4%	45.8	50.0	91.6%	0.9%
Benzene	46.6	50.0	93.2%	47.7	50.0	95.4%	2.3%
trans-1,3-Dichloropropene	47.9	50.0	95.8%	47.2	50.0	94.4%	1.5%
2-Chloroethylvinylether	56.4	50.0	113%	55.2	50.0	110%	2.2%
Bromoform	48.3	50.0	96.6%	46.5	50.0	93.0%	3.8%
4-Methyl-2-Pentanone (MIBK)	230	250	92.0%	220	250	88.0%	4.4%
2-Hexanone	223	250	89.2%	205	250	82.0%	8.4%
Tetrachloroethene	48.2	50.0	96.4%	50.4	50.0	101%	4.5%
1,1,2,2-Tetrachloroethane	45.2	50.0	90.4%	42.4	50.0	84.8%	6.4%
Toluene	46.5	50.0	93.0%	47.4	50.0	94.8%	1.9%
Chlorobenzene	46.3	50.0	92.6%	47.0	50.0	94.0%	1.5%
Ethylbenzene	46.5	50.0	93.0%	47.0	50.0	94.0%	1.1%
Styrene	46.5	50.0	93.0%	46.8	50.0	93.6%	0.6%
Trichlorofluoromethane	70.0 Q	50.0	140%	78.4 Q	50.0	157%	11.3%
1,1,2-Trichloro-1,2,2-trifluoroethane	60.8	50.0	122%	63.5	50.0	127%	4.3%

Lab Sample ID: LCS-020916A  
 LIMS ID: 16-1928  
 Matrix: Soil

QC Report No: AVO9-Boeing  
 Project: Boeing Apron A

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
m,p-Xylene	93.9	100	93.9%	95.9	100	95.9%	2.1%
o-Xylene	46.3	50.0	92.6%	47.1	50.0	94.2%	1.7%
1,2-Dichlorobenzene	47.0	50.0	94.0%	46.4	50.0	92.8%	1.3%
1,3-Dichlorobenzene	47.9	50.0	95.8%	48.1	50.0	96.2%	0.4%
1,4-Dichlorobenzene	47.4	50.0	94.8%	47.8	50.0	95.6%	0.8%
Acrolein	268	250	107%	273	250	109%	1.8%
Todmethane	44.5 Q	50.0	89.0%	37.6 Q	50.0	75.2%	16.8%
Bromoethane	59.6	50.0	119%	64.4	50.0	129%	7.7%
Acrylonitrile	52.4	50.0	105%	51.1	50.0	102%	2.5%
1,1-Dichloropropene	47.4	50.0	94.8%	49.8	50.0	99.6%	4.9%
Dibromomethane	46.8	50.0	93.6%	47.0	50.0	94.0%	0.4%
1,1,1,2-Tetrachloroethane	46.8	50.0	93.6%	47.3	50.0	94.6%	1.1%
1,2-Dibromo-3-chloropropane	45.4	50.0	90.8%	39.7	50.0	79.4%	13.4%
1,2,3-Trichloropropane	46.5	50.0	93.0%	43.5	50.0	87.0%	6.7%
trans-1,4-Dichloro-2-butene	44.3	50.0	88.6%	43.1	50.0	86.2%	2.7%
1,3,5-Trimethylbenzene	47.9	50.0	95.8%	48.4	50.0	96.8%	1.0%
1,2,4-Trimethylbenzene	48.0	50.0	96.0%	48.1	50.0	96.2%	0.2%
Hexachlorobutadiene	50.4	50.0	101%	49.3	50.0	98.6%	2.2%
1,2-Dibromoethane	46.5	50.0	93.0%	45.4	50.0	90.8%	2.4%
Bromochloromethane	58.7	50.0	117%	61.2	50.0	122%	4.2%
2,2-Dichloropropane	60.9	50.0	122%	64.1	50.0	128%	5.1%
1,3-Dichloropropane	43.9	50.0	87.8%	42.7	50.0	85.4%	2.8%
Isopropylbenzene	48.2	50.0	96.4%	49.2	50.0	98.4%	2.1%
n-Propylbenzene	48.3	50.0	96.6%	48.9	50.0	97.8%	1.2%
Bromobenzene	47.9	50.0	95.8%	47.0	50.0	94.0%	1.9%
2-Chlorotoluene	46.0	50.0	92.0%	46.4	50.0	92.8%	0.9%
4-Chlorotoluene	46.6	50.0	93.2%	46.7	50.0	93.4%	0.2%
tert-Butylbenzene	48.4	50.0	96.8%	48.3	50.0	96.6%	0.2%
sec-Butylbenzene	48.9	50.0	97.8%	49.2	50.0	98.4%	0.6%
4-Isopropyltoluene	49.3	50.0	98.6%	49.8	50.0	99.6%	1.0%
n-Butylbenzene	48.8	50.0	97.6%	49.5	50.0	99.0%	1.4%
1,2,4-Trichlorobenzene	50.6	50.0	101%	50.1	50.0	100%	1.0%
Naphthalene	47.7	50.0	95.4%	44.9	50.0	89.8%	6.0%
1,2,3-Trichlorobenzene	48.9	50.0	97.8%	47.5	50.0	95.0%	2.9%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	115%	117%
d8-Toluene	103%	104%
Bromofluorobenzene	96.2%	97.0%
d4-1,2-Dichlorobenzene	103%	102%

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C/NWTFHG  
Page 1 of 1

Sample ID: Apron-A-B-19-020516  
SAMPLE

Lab Sample ID: AVO9E

QC Report No: AVO9-Boeing

LIMS ID: 16-1932

Project: Boeing Apron A

Matrix: Soil

Data Release Authorized: *3*

Date Sampled: 02/05/16

Reported: 02/11/16

Date Received: 02/05/16

Instrument/Analyst: NT2/LH

Sample Amount: 128 mg-dry-wt

Date Analyzed: 02/10/16 16:47

Purge Volume: 10.0 mL

Moisture: 25.6%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
06290-81-5	Gasoline Range Hydrocarbons	7.8	< 7.8	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

oB-Toluene	96.4%
Bromofluorobenzene	103%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-20-020516  
SAMPLE

Lab Sample ID: AV09F  
LIMS ID: 16-1933  
Matrix: Soil  
Data Release Authorized: *B*  
Reported: 02/11/16

QC Report No: AV09-Boeing  
Project: Boeing Apron A

Date Sampled: 02/05/16  
Date Received: 02/05/16

Instrument/Analyst: NT2/LH  
Date Analyzed: 02/10/16 17:08

Sample Amount: 113 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: 21.3%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	8.8	< 8.8	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	97.6%
Bromofluorobenzene	108%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-15-0-5-020516  
SAMPLE

Lab Sample ID: AV09G  
LIMS ID: 16-1934  
Matrix: Soil  
Data Release Authorized: *B*  
Reported: 02/11/16

QC Report No: AV09-Boeing  
Project: Boeing Apron A

Date Sampled: 02/05/16  
Date Received: 02/05/16

Instrument/Analyst: NT2/LH  
Date Analyzed: 02/10/16 17:30

Sample Amount: 172 mg-dry-wt.  
Purge Volume: 10.0 mL  
Moisture: 17.7%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	5.8	8.7		GRO

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	97.6%
Bromofluorobenzene	106%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-15-6-12-020516  
SAMPLE

Lab Sample ID: AVO9H

QC Report No: AVO9-Boeing

LIMS ID: 16-1935

Project: Boeing Apron A

Matrix: Soil

Data Release Authorized:

Date Sampled: 02/05/16

Reported: 02/11/16

Date Received: 02/05/16

Instrument/Analyst: NT2/LH

Sample Amount: 90.6 mg-dry-wt

Date Analyzed: 02/10/16 17:51

Purge Volume: 10.0 mL

Moisture: 36.9%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	11	< 11	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**


d8-Toluene	99.0%
Bromofluorobenzene	111%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTFHG  
Page 1 of 1

Sample ID: MB-021016A  
METHOD BLANK

Lab Sample ID: MB-021016A  
LIMS ID: 16-1932  
Matrix: Soil  
Data Release Authorized:   
Reported: 02/11/16

QC Report No: AV09-Boeing  
Project: Boeing Apron A

Date Sampled: NA  
Date Received: NA

Instrument/Analyst: NT2/LH  
Date Analyzed: 02/10/16 11:07

Sample Amount: 200 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: NA

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	5.0	< 5.0	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	95.8%
Bromofluorobenzene	94.6%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AVO9-Boeing  
Project: Boeing Apron A

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-021016A	Method Blank	Med	NA	95.8%	94.6%	NA	0
LCS-021016A	Lab Control	Med	NA	98.4%	96.8%	NA	0
LCSD-021016A	Lab Control Dup	Med	NA	100%	95.8%	NA	0
AVO9E	Apron-A-B-19-020516	Med	NA	96.4%	103%	NA	0
AVO9F	Apron-A-B-20-020516	Med	NA	97.6%	108%	NA	0
AVO9G	Apron-A-B-15-0-5-020516	Med	NA	97.6%	106%	NA	0
AVO9H	Apron-A-B-15-6-12-020516	Med	NA	99.0%	111%	NA	0

LCS/MB LIMITS

QC LIMITS

SW8260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	80-149	80-124
(TOL) = d8-Toluene	77-120	80-120	77-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	80-120	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 16-1932 to 16-1935

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: LCS-021016A  
LAB CONTROL SAMPLE

Lab Sample ID: LCS-021016A  
LIMS ID: 16-1932  
Matrix: Soil  
Data Release Authorized: *AB*  
Reported: 02/11/16

QC Report No: AVO9-Boeing  
Project: Boeing Apron A

Date Sampled: NA  
Date Received: NA

Instrument/Analyst LCS: NT2/LH  
LCS: NT2/LH  
Date Analyzed LCS: 02/10/16 08:58  
LCS: 02/10/16 09:20

Sample Amount LCS: 200 mg-dry-wt  
LCS: 200 mg-dry-wt  
Purge Volume LCS: 10.0 mL  
LCS: 10.0 mL  
Moisture: NA

Analyte	Spike		LCS		Spike		LCS	
	LCS	Added-LCS	Recovery	LCS	Added-LCS	Recovery	RPD	
Gasoline Range Hydrocarbons	59.0	50.0	118%	59.0	50.0	118%	0.00	

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCS
d8-Toluene	98.4%	100%
Bromofluorobenzene	96.8%	95.8%

**ORGANICS ANALYSIS DATA SHEET  
TOTAL DIESEL RANGE HYDROCARBONS**

NWTPHD by GC/FID  
Extraction Method: SW3546  
Page 1 of 1

QC Report No: AVO9-Boeing  
Project: Boeing Apron A

Matrix: Soil

Date Received: 02/05/16

Data Release Authorized: *MMW*  
Reported: 02/10/16

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	LOQ	Result
MB-020916 16-1928	Method Blank HC ID: ---	02/09/16	02/09/16	1.00	Diesel Range	5.0	< 5.0 U
				1.0	Motor Oil Range	10	< 10 U
					o-Terphenyl		86.6%
AVO9A 16-1928	Apron-A-B-19-020516 HC ID: MOTOR OIL	02/09/16	02/09/16	1.00	Diesel Range	6.7	< 6.7 U
				1.0	Motor Oil Range	13	14
					o-Terphenyl		80.1%
AVO9B 16-1929	Apron-A-B-20-020516 HC ID: MOTOR OIL	02/09/16	02/09/16	1.00	Diesel Range	6.3	6.6
				1.0	Motor Oil Range	13	43
					o-Terphenyl		88.1%
AVO9C 16-1930	Apron-A-B-15-0-5-020502/09/16 HC ID: DIESEL/MOTOR OIL	02/09/16	02/09/16	1.00	Diesel Range	6.0	11
				1.0	Motor Oil Range	12	46
					o-Terphenyl		98.8%
AVO9D 16-1931	Apron-A-B-15-6-12-02002/09/16 HC ID: DIESEL/MOTOR OIL	02/09/16	02/09/16	1.00	Diesel Range	7.9	14
				1.0	Motor Oil Range	16	74
					o-Terphenyl		82.7%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.  
DL-Dilution of extract prior to analysis.  
LOQ-Limit of Quantitation

Diesel range quantitation on total peaks in the range from C12 to C24.  
Motor Oil range quantitation on total peaks in the range from C24 to C38.  
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

**TPHD SURROGATE RECOVERY SUMMARY**

Matrix: Soil

QC Report No: AV09-Boeing  
Project: Boeing Apron A

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
020916MB	86.6%	0
020916LCS	102%	0
Apron-A-B-19-020516	80.1%	0
Apron-A-B-20-020516	88.1%	0
Apron-A-B-15-0-5-020516	98.8%	0
Apron-A-B-15-6-12-020516	82.7%	0

**LCS/MB LIMITS      QC LIMITS**

(OTER) - o-Terphenyl

(50-150)

(50-150)

Prep Method: SW3546  
Log Number Range: 16-1928 to 16-1931

ORGANICS ANALYSIS DATA SHEET

NWTPHD by GC/FID

Page 1 of 1

Sample ID: LCS-020916  
LAB CONTROL

Lab Sample ID: LCS-020916

LIMS ID: 16-1928

Matrix: Soil

Data Release Authorized: *MW*

Reported: 02/10/16

QC Report No: AVO9-Boeing

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Date Extracted: 02/09/16

Date Analyzed: 02/09/16 19:56

Instrument/Analyst: FID4A/MI

Sample Amount: 10.0 g-dry-wt

Final Extract Volume: 1.0 mL

Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	142	150	94.7%

TPHD Surrogate Recovery

o-Terphenyl	102%
-------------	------

Results reported in mg/kg

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Soil  
Date Received: 02/05/16

ARI Job: AVO9  
Project: Boeing Apron A

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
16-1928-020916MB1	Method Blank	10.0 g	1.00 mL	-	02/09/16
16-1928-020916TCS1	Lab Control	10.0 g	1.00 mL	-	02/09/16
16-1928-AVO9A	Apron-A-B-19-0205167.48 g	167.48 g	1.00 mL	D	02/09/16
16-1929-AVO9B	Apron-A-B-20-0205167.93 g	167.93 g	1.00 mL	D	02/09/16
16-1930-AVO9C	Apron-A-B-15-0-5-028.26 g	28.26 g	1.00 mL	D	02/09/16
16-1931-AVO9D	Apron-A-B-15-6-12-06.356g	6.356g	1.00 mL	D	02/09/16

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: Apron-A-B-19-020516  
SAMPLE

Lab Sample ID: AVO9A

LIMS ID: 16-1928

Matrix: Soil

Data Release Authorized: 

Reported: 02/11/16

QC Report No: AVO9-Boeing

Project: Boeing Apron A

Date Sampled: 02/05/16

Date Received: 02/05/16

Percent Total Solids: 75.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/09/16	6010C	02/10/16	7429-90-5	Aluminum	6	22,300	
3050B	02/09/16	6010C	02/10/16	7440-38-2	Arsenic	6	6	U
3050B	02/09/16	6010C	02/10/16	7440-39-3	Barium	0.4	99.5	
3050B	02/09/16	6010C	02/10/16	7440-43-9	Cadmium	0.2	0.2	U
3050B	02/09/16	6010C	02/10/16	7440-70-2	Calcium	6	6,010	
3050B	02/09/16	6010C	02/10/16	7440-47-3	Chromium	0.6	40.0	
3050B	02/09/16	6010C	02/10/16	7440-48-4	Cobalt	0.4	14.1	
3050B	02/09/16	6010C	02/10/16	7440-50-8	Copper	0.2	33.9	
3050B	02/09/16	6010C	02/10/16	7439-89-6	Iron	6	27,300	
3050B	02/09/16	6010C	02/10/16	7439-92-1	Lead	2	5	
3050B	02/09/16	6010C	02/10/16	7439-95-4	Magnesium	6	7,440	
3050B	02/09/16	6010C	02/10/16	7439-98-7	Molybdenum	0.6	0.6	U
3050B	02/09/16	6010C	02/10/16	7440-02-0	Nickel	1	39	
3050B	02/09/16	6010C	02/10/16	7440-22-4	Silver	0.4	0.4	U
3050B	02/09/16	6010C	02/10/16	7440-66-6	Zinc	1	57	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-20-020516  
SAMPLE

Lab Sample ID: AVO9B

LIMS ID: 16-1929

Matrix: Soil

Data Release Authorized: 

Reported: 02/11/16

QC Report No: AVO9-Boeing

Project: Boeing Apron A

Date Sampled: 02/05/16

Date Received: 02/05/16

Percent Total Solids: 81.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/09/16	6010C	02/10/16	7429-90-5	Aluminum	6	16,100	
3050B	02/09/16	6010C	02/10/16	7440-38-2	Arsenic	6	6	U
3050B	02/09/16	6010C	02/10/16	7440-39-3	Barium	0.4	77.5	
3050B	02/09/16	6010C	02/10/16	7440-43-9	Cadmium	0.2	0.2	U
3050B	02/09/16	6010C	02/10/16	7440-70-2	Calcium	6	5,120	
3050B	02/09/16	6010C	02/10/16	7440-47-3	Chromium	0.6	38.3	
3050B	02/09/16	6010C	02/10/16	7440-48-4	Cobalt	0.4	10.5	
3050B	02/09/16	6010C	02/10/16	7440-50-8	Copper	0.2	26.2	
3050B	02/09/16	6010C	02/10/16	7439-89-6	Iron	6	22,700	
3050B	02/09/16	6010C	02/10/16	7439-92-1	Lead	2	9	
3050B	02/09/16	6010C	02/10/16	7439-95-4	Magnesium	6	6,630	
3050B	02/09/16	6010C	02/10/16	7439-98-7	Molybdenum	0.6	0.6	U
3050B	02/09/16	6010C	02/10/16	7440-02-0	Nickel	1	45	
3050B	02/09/16	6010C	02/10/16	7440-22-4	Silver	0.4	0.4	U
3050B	02/09/16	6010C	02/10/16	7440-66-6	Zinc	1	50	

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-15-0-5-020516  
SAMPLE

Lab Sample ID: AV09C

LIMS ID: 16-1930

Matrix: Soil

Data Release Authorized: *[Signature]*

Reported: 02/11/16

QC Report No: AV09-Boeing

Project: Boeing Apron A

Date Sampled: 02/05/16

Date Received: 02/05/16

Percent Total Solids: 84.5%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/09/16	6010C	02/10/16	7429-90-5	Aluminum	6	15,600	
3050B	02/09/16	6010C	02/10/16	7440-38-2	Arsenic	6	6	U
3050B	02/09/16	6010C	02/10/16	7440-39-3	Barium	0.4	78.8	
3050B	02/09/16	6010C	02/10/16	7440-43-9	Cadmium	0.2	0.2	U
3050B	02/09/16	6010C	02/10/16	7440-70-2	Calcium	6	6,110	
3050B	02/09/16	6010C	02/10/16	7440-47-3	Chromium	0.6	33.7	
3050B	02/09/16	6010C	02/10/16	7440-48-4	Cobalt	0.4	9.0	
3050B	02/09/16	6010C	02/10/16	7440-50-8	Copper	0.2	25.0	
3050B	02/09/16	6010C	02/10/16	7439-89-6	Iron	6	19,700	
3050B	02/09/16	6010C	02/10/16	7439-92-1	Lead	2	8	
3050B	02/09/16	6010C	02/10/16	7439-95-4	Magnesium	6	6,690	
3050B	02/09/16	6010C	02/10/16	7439-98-7	Molybdenum	0.6	0.6	U
3050B	02/09/16	6010C	02/10/16	7440-02-0	Nickel	1	40	
3050B	02/09/16	6010C	02/10/16	7440-22-4	Silver	0.4	0.4	U
3050B	02/09/16	6010C	02/10/16	7440-66-6	Zinc	1	45	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-15-6-12-020516  
SAMPLE

Lab Sample ID: AVO9D

LIMS ID: 16-1931

Matrix: Soil

Data Release Authorized:

Reported: 02/11/16

QC Report No: AVO9-Bocing

Project: Bocing Apron A

Date Sampled: 02/05/16

Date Received: 02/05/16

Percent Total Solids: 61.7%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/09/16	6010C	02/10/16	7429-90-5	Aluminum	8	24,100	
3050B	02/09/16	6010C	02/10/16	7440-38-2	Arsenic	8	8	U
3050B	02/09/16	6010C	02/10/16	7440-39-3	Barium	0.5	114	
3050B	02/09/16	6010C	02/10/16	7440-43-9	Cadmium	0.3	0.3	U
3050B	02/09/16	6010C	02/10/16	7440-70-2	Calcium	8	6,410	
3050B	02/09/16	6010C	02/10/16	7440-47-3	Chromium	0.8	47.0	
3050B	02/09/16	6010C	02/10/16	7440-48-4	Cobalt	0.5	14.1	
3050B	02/09/16	6010C	02/10/16	7440-50-8	Copper	0.3	37.8	
3050B	02/09/16	6010C	02/10/16	7439-89-6	Iron	8	27,900	
3050B	02/09/16	6010C	02/10/16	7439-92-1	Lead	3	5	
3050B	02/09/16	6010C	02/10/16	7439-95-4	Magnesium	8	8,150	
3050B	02/09/16	6010C	02/10/16	7439-98-7	Molybdenum	0.8	0.8	U
3050B	02/09/16	6010C	02/10/16	7440-02-0	Nickel	2	42	
3050B	02/09/16	6010C	02/10/16	7440-22-4	Silver	0.5	0.5	U
3050B	02/09/16	6010C	02/10/16	7440-66-6	Zinc	2	70	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation



INORGANICS ANALYSIS DATA SHEET

TOTAL METALS

Sample ID: METHOD BLANK

Page 1 of 1

Lab Sample ID: AVO9MB

QC Report No: AVO9-Boeing

LIMS ID: 16-1931

Project: Boeing Apron A

Matrix: Soil

Data Release Authorized: *[Signature]*

Date Sampled: NA

Reported: 02/11/16

Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/09/16	6010C	02/10/16	7429-90-5	Aluminum	5	5	U
3050B	02/09/16	6010C	02/10/16	7440-38-2	Arsenic	5	5	U
3050B	02/09/16	6010C	02/10/16	7440-39-3	Barium	0.3	0.3	U
3050B	02/09/16	6010C	02/10/16	7440-43-9	Cadmium	0.2	0.2	U
3050B	02/09/16	6010C	02/10/16	7440-70-2	Calcium	5	5	U
3050B	02/09/16	6010C	02/10/16	7440-47-3	Chromium	0.5	0.5	U
3050B	02/09/16	6010C	02/10/16	7440-48-4	Cobalt	0.3	0.3	U
3050B	02/09/16	6010C	02/10/16	7440-50-8	Copper	0.2	0.2	U
3050B	02/09/16	6010C	02/10/16	7439-89-6	Iron	5	5	U
3050B	02/09/16	6010C	02/10/16	7439-92-1	Lead	2	2	U
3050B	02/09/16	6010C	02/10/16	7439-95-4	Magnesium	5	5	U
3050B	02/09/16	6010C	02/10/16	7439-98-7	Molybdenum	0.5	0.5	U
3050B	02/09/16	6010C	02/10/16	7440-02-0	Nickel	1	1	U
3050B	02/09/16	6010C	02/10/16	7440-22-4	Silver	0.3	0.3	U
3050B	02/09/16	6010C	02/10/16	7440-66-6	Zinc	1	1	U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: AVO9LCS

LIMS ID: 16-1931

Matrix: Soil

Data Release Authorized: 

Reported: 02/11/16

QC Report No: AVO9-Boeing

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	205	200	102%	
Arsenic	6010C	205	200	102%	
Barium	6010C	209	200	104%	
Cadmium	6010C	51.8	50.0	104%	
Calcium	6010C	1000	1000	100%	
Chromium	6010C	51.8	50.0	104%	
Cobalt	6010C	50.4	50.0	101%	
Copper	6010C	50.0	50.0	100%	
Iron	6010C	203	200	102%	
Lead	6010C	208	200	104%	
Magnesium	6010C	994	1000	99.4%	
Molybdenum	6010C	50.0	50.0	100%	
Nickel	6010C	54	50	108%	
Silver	6010C	55.3	50.0	111%	
Zinc	6010C	51	50	102%	

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%





**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

February 24, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101



**RE: Project: Boeing Renton Apron A**  
**ARI Job: AWI8**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted four soil samples and a trip blank in good condition on February 22, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for VOCs on a rush turn around time, as requested on the COC. All other analyses were logged under a different ARI SDG based on client specified turn around times.

The VOCs CCAL is out of control high for all associated FORM III "Q" flagged analytes with the exception of Iodomethane which is out of control low. All associated samples that contain analyte have been flagged with a "Q" qualifier.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

  
Kelly Bottem  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **AW18**  
 ARI Client Company: **AMEC**  
 Client Contact: **Crystal Thimsen**  
 Client Project Name: **Boeing Apron A**  
 Client Project #: **Boeing Apron A**

Turn-around Requested: **YOC 48hr Tptt + metals - 73 hrs**  
 Phone: **206-838-8469**

Page: **1** of **1**  
 Date: **2/20/16**  
 No. of Coolers: **1**  
 Ice Present? **Y**  
 Cooler Temps: **0.8**



Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					Top-G	Top-G	Top-Dx LL	Metals, 23	
Apron-A-B-17-07-022016	2/20/16	8:45	SOIL	8	X	X	X	X	* Hold
Apron-A-B-17-15-022016	↓	9:10	SOIL	8	X	X	X	X	
Apron-A-B-16-07-022016	↓	10:15	SOIL	8	X	X	X	X	
Apron-A-B-16-7-13-022016	↓	10:30	SOIL	8	X	X	X	X	
TREBUNK-022016	2/20/16	-	water	2	X				
Comments/Special Instructions * Hold for Tptt-Dx w/ Siliconel succs plus, TLE metals SEND RESULTS TO Nancy Swenson w/BBEM									
Relinquished by: (Signature) <i>Jennifer Bellamy</i> Printed Name: <b>Jennifer Bellamy</b> Company: <b>AMEC</b> Date & Time: <b>2/22/15 7:17</b>					Received by: (Signature) <i>A. Norgardson</i> Printed Name: <b>A. Norgardson</b> Company: <b>ARI</b> Date & Time: <b>2/22/16 7:17</b>				

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: Breing

Project Name: Apron A

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier  Hand Delivered  Other: \_\_\_\_\_

Assigned ARI Job No: AW18

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES  NO

Were custody papers included with the cooler? ..... YES  NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)  
Time: \_\_\_\_\_ 0.8 \_\_\_\_\_  
If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D085376

Cooler Accepted by: AV Date: 2/22/16 Time: 7:17

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES  NO

What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Raggies  Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA  YES  NO

Were all bottles sealed in individual plastic bags? ..... YES  NO

Did all bottles arrive in good condition (unbroken)? ..... YES  NO

Were all bottle labels complete and legible? ..... YES  NO

Did the number of containers listed on COC match with the number of containers received? ..... YES  NO

Did all bottle labels and tags agree with custody papers? ..... YES  NO

Were all bottles used correct for the requested analyses? ..... YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA  YES  NO

Were all VOC vials free of air bubbles? ..... NA  YES  NO

Was sufficient amount of sample sent in each bottle? ..... YES  NO

Date VOC Trip Blank was made at ARI: ..... NA  2/5/16

Was Sample Split by ARI: NA  YES  Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

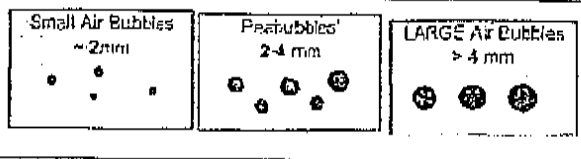
Samples Logged by: TR Date: 2-22-16 Time: 0938

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Small → "sm" (< 2 mm)  
Peabubbles → "pb" (2 to < 4 mm)  
Large → "lg" (4 to < 6 mm)  
Headspace → "hs" (> 6 mm)

# Sample ID Cross Reference Report



ARI Job No: AWI8  
Client: AMEC Environment & Infrastructure  
Project Event: N/A  
Project Name: Boeing Apron A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron-A-B-17-0-7-022016	AWI8A	16-2788	Soil	02/20/16 08:45	02/22/16 07:17
2. Apron-A-B-17-7-15-022016	AWI8B	16-2789	Soil	02/20/16 09:10	02/22/16 07:17
3. Apron-A-B-16-0-7-022016	AWI8C	16-2790	Soil	02/20/16 10:15	02/22/16 07:17
4. Apron-A-B-16-7-15-022016	AWI8D	16-2791	Soil	02/20/16 10:30	02/22/16 07:17
5. Trip Blank-022016	AWI8E	16-2792	Water	02/20/16	02/22/16 07:17

Lab Sample ID: AWI8A

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2788

Matrix: Soil

Data Release Authorized: *MW*

Date Sampled: 02/20/16

Reported: 02/24/16

Date Received: 02/22/16

Instrument/Analyst: NT5/PAB

Sample Amount: 5.26 g-dry-wt

Date Analyzed: 02/23/16 16:01

Purge Volume: 5.0 mL

Moisture: 12.8%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	1.9	< 1.9	U
<b>67-64-1</b>	<b>Acetone</b>	<b>4.8</b>	<b>9.8</b>	
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	4.8	< 4.8	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	4.8	< 4.8	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	4.8	< 4.8	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	4.8	< 4.8	U
591-78-6	2-Hexanone	4.8	< 4.8	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.9	< 1.9	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	4.8	< 4.8	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	1.9	< 1.9	U
107-13-1	Acrylonitrile	4.8	< 4.8	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	4.8	< 4.8	U
96-18-4	1,2,3-Trichloropropane	1.9	< 1.9	U
110-57-6	trans-1,4-Dichloro-2-butene	4.8	< 4.8	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

Lab Sample ID: AW18A  
 LIMS ID: 16-2788  
 Matrix: Soil  
 Date Analyzed: 02/23/16 16:01

QC Report No: AW18-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	4.8	< 4.8	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	4.8	< 4.8	U
91-20-3	Naphthalene	4.8	< 4.8	U
87-61-6	1,2,3-Trichlorobenzene	4.8	< 4.8	U

Reported in ug/kg (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	101%
Bromofluorobenzene	92.3%
d4-1,2-Dichlorobenzene	107%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B-17-7-15-022016  
SAMPLE

Lab Sample ID: AWI8B  
LIMS ID: 16-2789  
Matrix: Soil  
Data Release Authorized: *MMW*  
Reported: 02/24/16

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16  
Date Received: 02/22/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 02/23/16 16:23

Sample Amount: 1.31 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 59.4%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	3.8	< 3.8	U
74-83-9	Bromomethane	3.8	< 3.8	U
75-01-4	Vinyl Chloride	3.8	< 3.8	U
75-00-3	Chloroethane	3.8	< 3.8	U
75-09-2	Methylene Chloride	7.6	< 7.6	U
<b>67-64-1</b>	<b>Acetone</b>	<b>19</b>	<b>160</b>	
<b>75-15-0</b>	<b>Carbon Disulfide</b>	<b>3.8</b>	<b>4.8</b>	
75-35-4	1,1-Dichloroethene	3.8	< 3.8	U
75-34-3	1,1-Dichloroethane	3.8	< 3.8	U
156-60-5	trans-1,2-Dichloroethene	3.8	< 3.8	U
156-59-2	cis-1,2-Dichloroethene	3.8	< 3.8	U
67-66-3	Chloroform	3.8	< 3.8	U
107-06-2	1,2-Dichloroethane	3.8	< 3.8	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>19</b>	<b>31</b>	
71-55-6	1,1,1-Trichloroethane	3.8	< 3.8	U
56-23-5	Carbon Tetrachloride	3.8	< 3.8	U
108-05-4	Vinyl Acetate	19	< 19	U
75-27-4	Bromodichloromethane	3.8	< 3.8	U
78-87-5	1,2-Dichloropropane	3.8	< 3.8	U
10061-01-5	cis-1,3-Dichloropropene	3.8	< 3.8	U
79-01-6	Trichloroethene	3.8	< 3.8	U
124-48-1	Dibromochloromethane	3.8	< 3.8	U
79-00-5	1,1,2-Trichloroethane	3.8	< 3.8	U
71-43-2	Benzene	3.8	< 3.8	U
10061-02-6	trans-1,3-Dichloropropene	3.8	< 3.8	U
110-75-8	2-Chloroethylvinylether	19	< 19	U
75-25-2	Bromoform	3.8	< 3.8	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	19	< 19	U
591-78-6	2-Hexanone	19	< 19	U
127-18-4	Tetrachloroethene	3.8	< 3.8	U
79-34-5	1,1,2,2-Tetrachloroethane	3.8	< 3.8	U
108-88-3	Toluene	3.8	< 3.8	U
108-90-7	Chlorobenzene	3.8	< 3.8	U
100-41-4	Ethylbenzene	3.8	< 3.8	U
100-42-5	Styrene	3.8	< 3.8	U
75-69-4	Trichlorofluoromethane	3.8	< 3.8	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.6	< 7.6	U
179601-23-1	m,p-Xylene	3.8	< 3.8	U
95-47-6	o-Xylene	3.8	< 3.8	U
95-50-1	1,2-Dichlorobenzene	3.8	< 3.8	U
541-73-1	1,3-Dichlorobenzene	3.8	< 3.8	U
106-46-7	1,4-Dichlorobenzene	3.8	< 3.8	U
107-02-8	Acrolein	19	< 19	U
74-88-4	Iodomethane	3.8	< 3.8	U
74-96-4	Bromoethane	7.6	< 7.6	U
107-13-1	Acrylonitrile	19	< 19	U
563-58-6	1,1-Dichloropropene	3.8	< 3.8	U
74-95-3	Dibromomethane	3.8	< 3.8	U
630-20-6	1,1,1,2-Tetrachloroethane	3.8	< 3.8	U
96-12-8	1,2-Dibromo-3-chloropropane	19	< 19	U
96-18-4	1,2,3-Trichloropropane	7.6	< 7.6	U
110-57-6	trans-1,4-Dichloro-2-butene	19	< 19	U
108-67-8	1,3,5-Trimethylbenzene	3.8	< 3.8	U

Lab Sample ID: AWI8R  
 LTMS ID: 16-2789  
 Matrix: Soil  
 Date Analyzed: 02/23/16 16:23

QC Report No: AWI8-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	3.8	< 3.8	U
87-68-3	Hexachlorobutadiene	19	< 19	U
106-93-4	1,2-Dibromoethane	3.8	< 3.8	U
74-97-5	Bromochloromethane	3.8	< 3.8	U
594-20-7	2,2-Dichloropropane	3.8	< 3.8	U
142-28-9	1,3-Dichloropropane	3.8	< 3.8	U
98-82-8	Isopropylbenzene	3.8	< 3.8	U
103-65-1	n-Propylbenzene	3.8	< 3.8	U
108-86-1	Bromobenzene	3.8	< 3.8	U
95-49-8	2-Chlorotoluene	3.8	< 3.8	U
106-43-4	4-Chlorotoluene	3.8	< 3.8	U
98-06-6	tert-Butylbenzene	3.8	< 3.8	U
135-98-8	sec-Butylbenzene	3.8	< 3.8	U
99-87-6	4-Isopropyltoluene	3.8	< 3.8	U
104-51-6	n-Butylbenzene	3.8	< 3.8	U
120-82-1	1,2,4-Trichlorobenzene	19	< 19	U
91-20-3	Naphthalene	19	< 19	U
87-61-6	1,2,3-Trichlorobenzene	19	< 19	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	119%
d8-Toluene	102%
Bromofluorobenzene	90.0%
d4-1,2-Dichlorobenzene	99.3%

Lab Sample ID: AWI8C  
 LIMS ID: 16-2790  
 Matrix: Soil  
 Data Release Authorized: *MMW*  
 Reported: 02/24/16

QC Report No: AWI8-AMEC Environment & Infrastructure  
 Project: Boeing Apron A  
 Date Sampled: 02/20/16  
 Date Received: 02/22/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 02/23/16 16:46

Sample Amount: 3.27 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 44.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.5	< 1.5	U
74-83-9	Bromomethane	1.5	< 1.5	U
75-01-4	Vinyl Chloride	1.5	< 1.5	U
75-00-3	Chloroethane	1.5	< 1.5	U
75-09-2	Methylene Chloride	3.1	< 3.1	U
<b>67-64-1</b>	<b>Acetone</b>	<b>7.6</b>	<b>20</b>	
75-15-0	Carbon Disulfide	1.5	< 1.5	U
75-35-4	1,1-Dichloroethene	1.5	< 1.5	U
75-34-3	1,1-Dichloroethane	1.5	< 1.5	U
156-60-5	trans-1,2-Dichloroethene	1.5	< 1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	< 1.5	U
67-66-3	Chloroform	1.5	< 1.5	U
107-06-2	1,2-Dichloroethane	1.5	< 1.5	U
78-93-3	2-Butanone	7.6	< 7.6	U
71-55-6	1,1,1-Trichloroethane	1.5	< 1.5	U
56-23-5	Carbon Tetrachloride	1.5	< 1.5	U
108-05-4	Vinyl Acetate	7.6	< 7.6	U
75-27-4	Bromodichloromethane	1.5	< 1.5	U
78-87-5	1,2-Dichloropropane	1.5	< 1.5	U
10061-01-5	cis-1,3-Dichloropropene	1.5	< 1.5	U
79-01-6	Trichloroethene	1.5	< 1.5	U
124-48-1	Dibromochloromethane	1.5	< 1.5	U
79-00-5	1,1,2-Trichloroethane	1.5	< 1.5	U
71-43-2	Benzene	1.5	< 1.5	U
10061-02-6	trans-1,3-Dichloropropene	1.5	< 1.5	U
110-75-8	2-Chloroethylvinylether	7.6	< 7.6	U
75-25-2	Bromoform	1.5	< 1.5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.6	< 7.6	U
591-78-6	2-Hexanone	7.6	< 7.6	U
127-18-4	Tetrachloroethene	1.5	< 1.5	U
79-34-5	1,1,2,2-Tetrachloroethane	1.5	< 1.5	U
108-88-3	Toluene	1.5	< 1.5	U
108-90-7	Chlorobenzene	1.5	< 1.5	U
100-41-4	Ethylbenzene	1.5	< 1.5	U
100-42-5	Styrene	1.5	< 1.5	U
75-69-4	Trichlorofluoromethane	1.5	< 1.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	< 3.1	U
179601-23-1	m,p-Xylene	1.5	< 1.5	U
95-47-6	o-Xylene	1.5	< 1.5	U
95-50-1	1,2-Dichlorobenzene	1.5	< 1.5	U
541-73-1	1,3-Dichlorobenzene	1.5	< 1.5	U
106-46-7	1,4-Dichlorobenzene	1.5	< 1.5	U
107-02-8	Acrolein	7.6	< 7.6	U
74-88-4	Iodomethane	1.5	< 1.5	U
74-96-4	Bromoethane	3.1	< 3.1	U
107-13-1	Acrylonitrile	7.6	< 7.6	U
563-58-6	1,1-Dichloropropene	1.5	< 1.5	U
74-95-3	Dibromomethane	1.5	< 1.5	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	< 1.5	U
96-12-8	1,2-Dibromo-3-chloropropane	7.6	< 7.6	U
96-18-4	1,2,3-Trichloropropane	3.1	< 3.1	U
110-57-6	trans-1,4-Dichloro-2-butene	7.6	< 7.6	U
108-67-8	1,3,5-Trimethylbenzene	1.5	< 1.5	U

Lab Sample ID: AWI8C  
 LIMS ID: 16-2790  
 Matrix: Soil  
 Date Analyzed: 02/23/16 16:46

QC Report No: AWI8-AMEC Environment & Infrastructure  
 Project: Roeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.5	< 1.5	U
87-68-3	Hexachlorobutadiene	7.6	< 7.6	U
106-93-4	1,2-Dibromoethane	1.5	< 1.5	U
74-97-5	Bromochloromethane	1.5	< 1.5	U
594-20-7	2,2-Dichloropropane	1.5	< 1.5	U
142-28-9	1,3-Dichloropropane	1.5	< 1.5	U
98-82-8	Isopropylbenzene	1.5	< 1.5	U
103-65-1	n-Propylbenzene	1.5	< 1.5	U
108-86-1	Bromobenzene	1.5	< 1.5	U
95-49-8	2-Chlorotoluene	1.5	< 1.5	U
106-43-4	4-Chlorotoluene	1.5	< 1.5	U
98-06-6	tert-Butylbenzene	1.5	< 1.5	U
135-98-8	sec-Butylbenzene	1.5	< 1.5	U
99-87-6	4-Isopropyltoluene	1.5	< 1.5	U
104-51-8	n-Butylbenzene	1.5	< 1.5	U
120-82-1	1,2,4-Trichlorobenzene	7.6	< 7.6	U
91-20-3	Naphthalene	7.6	< 7.6	U
87-61-6	1,2,3-Trichlorobenzene	7.6	< 7.6	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	126%
d8-Toluene	103%
Bromofluorobenzene	96.5%
d4-1,2-Dichlorobenzene	106%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
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Sample ID: Apron-A-B-16-7-15-022016  
SAMPLE

Lab Sample ID: AWI8D  
LIMS ID: 16-2791  
Matrix: Soil  
Data Release Authorized: *mmw*  
Reported: 02/24/16

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16  
Date Received: 02/22/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 02/23/16 17:09

Sample Amount: 2.00 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 41.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	2.5	< 2.5	U
74-83-9	Bromomethane	2.5	< 2.5	U
75-01-4	Vinyl Chloride	2.5	< 2.5	U
75-00-3	Chloroethane	2.5	< 2.5	U
75-09-2	Methylene Chloride	5.0	< 5.0	U
<b>67-64-1</b>	<b>Acetone</b>	<b>12</b>	<b>180</b>	
<b>75-15-0</b>	<b>Carbon Disulfide</b>	<b>2.5</b>	<b>2.6</b>	
75-35-4	1,1-Dichloroethene	2.5	< 2.5	U
75-34-3	1,1-Dichloroethane	2.5	< 2.5	U
156-60-5	trans-1,2-Dichloroethene	2.5	< 2.5	U
156-59-2	cis-1,2-Dichloroethene	2.5	< 2.5	U
67-66-3	Chloroform	2.5	< 2.5	U
107-06-2	1,2-Dichloroethane	2.5	< 2.5	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>12</b>	<b>42</b>	
71-55-6	1,1,1-Trichloroethane	2.5	< 2.5	U
56-23-5	Carbon Tetrachloride	2.5	< 2.5	U
108-05-4	Vinyl Acetate	12	< 12	U
75-27-4	Bromodichloromethane	2.5	< 2.5	U
78-87-5	1,2-Dichloropropane	2.5	< 2.5	U
10061-01-5	cis-1,3-Dichloropropene	2.5	< 2.5	U
79-01-6	Trichloroethene	2.5	< 2.5	U
124-48-1	Dibromochloromethane	2.5	< 2.5	U
79-00-5	1,1,2-Trichloroethane	2.5	< 2.5	U
71-43-2	Benzene	2.5	< 2.5	U
10061-02-6	trans-1,3-Dichloropropene	2.5	< 2.5	U
110-75-8	2-Chloroethylvinylether	12	< 12	U
75-25-2	Bromoform	2.5	< 2.5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	12	< 12	U
591-78-6	2-Hexanone	12	< 12	U
127-18-4	Tetrachloroethene	2.5	< 2.5	U
79-34-5	1,1,2,2-Tetrachloroethane	2.5	< 2.5	U
108-88-3	Toluene	2.5	< 2.5	U
108-90-7	Chlorobenzene	2.5	< 2.5	U
100-41-4	Ethylbenzene	2.5	< 2.5	U
100-42-5	Styrene	2.5	< 2.5	U
75-69-4	Trichlorofluoromethane	2.5	< 2.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	< 5.0	U
179601-23-1	m,p-Xylene	2.5	< 2.5	U
95-47-6	o-Xylene	2.5	< 2.5	U
95-50-1	1,2-Dichlorobenzene	2.5	< 2.5	U
541-73-1	1,3-Dichlorobenzene	2.5	< 2.5	U
106-46-7	1,4-Dichlorobenzene	2.5	< 2.5	U
107-02-8	Acrolein	12	< 12	U
74-88-4	Iodomethane	2.5	< 2.5	U
74-96-4	Bromoethane	5.0	< 5.0	U
107-13-1	Acrylonitrile	12	< 12	U
563-58-6	1,1-Dichloropropene	2.5	< 2.5	U
74-95-3	Dibromomethane	2.5	< 2.5	U
630-20-6	1,1,1,2-Tetrachloroethane	2.5	< 2.5	U
96-12-8	1,2-Dibromo-3-chloropropane	12	< 12	U
96-18-4	1,2,3-Trichloropropane	5.0	< 5.0	U
110-57-6	trans-1,4-Dichloro-2-butene	12	< 12	U
108-67-8	1,3,5-Trimethylbenzene	2.5	< 2.5	U

Lab Sample ID: AW18D  
 LIMS ID: 16-2791  
 Matrix: Soil  
 Date Analyzed: 02/23/16 17:09

QC Report No: AW18-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	2.5	< 2.5	U
87-68-3	Hexachlorobutadiene	12	< 12	U
106-93-4	1,2-Dibromoethane	2.5	< 2.5	U
74-97-5	Bromochloromethane	2.5	< 2.5	U
594-20-7	2,2-Dichloropropane	2.5	< 2.5	U
142-28-9	1,3-Dichloropropane	2.5	< 2.5	U
98-82-8	Isopropylbenzene	2.5	< 2.5	U
103-65-1	n-Propylbenzene	2.5	< 2.5	U
108-86-1	Bromobenzene	2.5	< 2.5	U
95-49-8	2-Chlorotoluene	2.5	< 2.5	U
106-43-4	4-Chlorotoluene	2.5	< 2.5	U
98-06-6	tert-Butylbenzene	2.5	< 2.5	U
135-98-8	sec-Butylbenzene	2.5	< 2.5	U
99-87-6	4-Isopropyltoluene	2.5	< 2.5	U
104-51-8	n-Butylbenzene	2.5	< 2.5	U
120-82-1	1,2,4-Trichlorobenzene	12	< 12	U
91-20-3	Naphthalene	12	< 12	U
87-61-6	1,2,3-Trichlorobenzene	12	< 12	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	118%
d8-Toluene	100%
Bromofluorobenzene	89.7%
d4-1,2-Dichlorobenzene	99.1%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: Trip Blank-022016  
SAMPLE

Lab Sample ID: AWI8E

LIMS ID: 16-2792

Matrix: Water

Data Release Authorized: *MW*

Reported: 02/24/16

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16

Date Received: 02/22/16

Instrument/Analyst: NT5/PAB

Date Analyzed: 02/23/16 17:32

Sample Amount: 5.00 mL

Purge Volume: 5.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	10	< 10	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: Trip Blank-022016  
SAMPLE

Lab Sample ID: AWI8E

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2792

Matrix: Water

Date Analyzed: 02/23/16 17:32

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	10	< 10	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	5.0	< 5.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	117%
d8-Toluene	103%
Bromofluorobenzene	97.8%
d4-1,2-Dichlorobenzene	104%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Sample ID: MB-022316A

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METHOD BLANK

Lab Sample ID: MB-022316A

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2788

Matrix: Soil

Data Release Authorized: *MW*

Date Sampled: NA

Reported: 02/24/16

Date Received: NA

Instrument/Analyst: NT5/PAB

Sample Amount: 5.00 g-dry-wt

Date Analyzed: 02/23/16 12:56

Purge Volume: 5.0 mL

Moisture: NA

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

Sample ID: MB-022316A  
 METHOD BLANK

Lab Sample ID: MB-022316A  
 LIMS ID: 16-2788  
 Matrix: Soil  
 Date Analyzed: 02/23/16 12:56

QC Report No: AWI8-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	113%
d8-Toluene	103%
Bromofluorobenzene	96.8%
d4-1,2-Dichlorobenzene	104%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AWI8-AMEC Environment & Infrastructure  
Project: Boeing Apron A

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-022316A	Method Blank	Low	113%	103%	96.8%	104%	0
LCS-022316A	Lab Control	Low	111%	103%	96.0%	104%	0
LCS-D-022316A	Lab Control Dup	Low	111%	102%	96.1%	102%	0
AWT8A	Apron-A-B-17-0-7-022016	Low	118%	101%	92.3%	107%	0
AWT8B	Apron-A-B-17-7-15-022016	Low	119%	102%	90.0%	99.3%	0
AWI8C	Apron-A-B-16-0-7-022016	Low	126%	103%	96.5%	106%	0
AWI8D	Apron-A-B-16-7-15-022016	Low	118%	100%	89.7%	99.1%	0

LCS/MB LIMITS

QC LIMITS

SW8260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	78-151	80-124
(TOL) = d8-Toluene	77-120	80-120	80-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	75-124	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 16-2788 to 16-2791

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AWI8-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
AWI8E	Trip Blank-022016	5	117%	103%	97.8%	104%	0

LCS/MS LIMITS

QC LIMITS

SW8260C

- (DCE) = d4-1,2-Dichloroethane
- (TOL) = d8-Toluene
- (BFB) = Bromofluorobenzene
- (DCB) = d4-1,2-Dichlorobenzene

- 80-149
- 77-120
- 80-120
- 80-120

- 80-125
- 80-120
- 80-120
- 80-120

Prep Method: SW5030B  
 Log Number Range: 16-2792 to 16-2792

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: LCS-022316A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-022316A

LIMS ID: 16-2788

Matrix: Soil

Data Release Authorized: *MW*

Reported: 02/24/16

QC Report No: AW18-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Instrument/Analyst LCS: NT5/PAB

LCSD: NT5/PAB

Date Analyzed LCS: 02/23/16 12:34

LCSD: 02/23/16 13:47

Sample Amount LCS: 5.00 g-dry-wt

LCSD: 5.00 g-dry-wt

Purge Volume LCS: 5.0 mL

LCSD: 5.0 mL

Moisture: NA

Analyte	LCS	Spike		LCS Recovery	LCSD	Spike		LCSD Recovery	RPD
		Added-LCS	Recovery			Added-LCSD	Recovery		
Chloromethane	46.1	50.0	92.2%	51.6	50.0	103%	11.3%		
Bromomethane	49.6	50.0	99.2%	56.6	50.0	113%	13.2%		
Vinyl Chloride	49.7	50.0	99.4%	55.6	50.0	111%	11.2%		
Chloroethane	50.4	50.0	101%	56.2	50.0	112%	10.9%		
Methylene Chloride	47.2	50.0	94.4%	49.2	50.0	98.4%	4.1%		
Acetone	221	250	88.4%	212	250	84.8%	4.2%		
Carbon Disulfide	52.1	50.0	104%	57.6	50.0	115%	10.0%		
1,1-Dichloroethene	53.9	50.0	108%	60.1	50.0	120%	10.9%		
1,1-Dichloroethane	49.2	50.0	98.4%	53.5	50.0	107%	8.4%		
trans-1,2-Dichloroethene	54.3	50.0	109%	59.7	50.0	119%	9.5%		
cis-1,2-Dichloroethene	52.7	50.0	105%	56.4	50.0	113%	6.8%		
Chloroform	52.2	50.0	104%	55.9	50.0	112%	6.6%		
1,2-Dichloroethane	39.9	50.0	79.8%	40.4	50.0	80.8%	1.2%		
2-Butanone	286	250	114%	268	250	107%	6.5%		
1,1,1-Trichloroethane	53.1	50.0	106%	58.9	50.0	118%	10.4%		
Carbon Tetrachloride	47.4	50.0	94.8%	52.0	50.0	104%	9.3%		
Vinyl Acetate	49.8	50.0	99.6%	50.2	50.0	100%	0.8%		
Bromodichloromethane	43.7	50.0	87.4%	44.4	50.0	88.8%	1.6%		
1,2-Dichloropropane	40.5	50.0	81.0%	42.3	50.0	84.6%	4.3%		
cis-1,3-Dichloropropene	43.6	50.0	87.2%	44.7	50.0	89.4%	2.5%		
Trichloroethene	43.3	50.0	86.6%	47.1	50.0	94.2%	8.4%		
Dibromochloromethane	44.2	50.0	88.4%	44.2	50.0	88.4%	0.0%		
1,1,2-Trichloroethane	44.2	50.0	88.4%	43.9	50.0	87.8%	0.7%		
Benzene	43.4	50.0	86.8%	46.6	50.0	93.2%	7.1%		
trans-1,3-Dichloropropene	44.9	50.0	89.8%	45.0	50.0	90.0%	0.2%		
2-Chloroethylvinylether	54.3	50.0	109%	52.4	50.0	105%	3.6%		
Bromoform	47.4	50.0	94.8%	45.0	50.0	90.0%	5.2%		
4-Methyl-2-Pentanone (MTBK)	227	250	90.8%	205	250	82.0%	10.2%		
2-Hexanone	212	250	84.8%	191	250	76.4%	10.4%		
Tetrachloroethene	45.6	50.0	91.2%	50.4	50.0	101%	10.0%		
1,1,2,2-Tetrachloroethane	43.6	50.0	87.2%	40.4	50.0	80.8%	7.6%		
Toluene	43.5	50.0	87.0%	46.0	50.0	92.0%	5.6%		
Chlorobenzene	42.9	50.0	85.8%	45.9	50.0	91.8%	6.8%		
Ethylbenzene	43.0	50.0	86.0%	46.1	50.0	92.2%	7.0%		
Styrene	43.4	50.0	86.8%	45.8	50.0	91.6%	5.4%		
Trichlorofluoromethane	64.3 Q	50.0	129%	74.4 Q	50.0	149%	14.6%		
1,1,2-Trichloro-1,2,2-trifluoroetha	54.7	50.0	109%	63.5	50.0	127%	14.9%		

Lab Sample ID: LCS-022316A  
LIMS ID: 16-2788  
Matrix: Soil

QC Report No: AW18-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
m,p-Xylene	86.7	100	86.7%	93.8	100	93.8%	7.9%
o-Xylene	43.7	50.0	87.4%	46.8	50.0	93.6%	6.9%
1,2-Dichlorobenzene	44.6	50.0	89.2%	45.1	50.0	90.2%	1.1%
1,3-Dichlorobenzene	45.7	50.0	91.4%	47.6	50.0	95.2%	4.1%
1,4-Dichlorobenzene	45.0	50.0	90.0%	46.9	50.0	93.8%	4.1%
Acrolein	246	250	98.4%	242	250	96.8%	1.6%
Iodomethane	40.3 Q	50.0	80.6%	39.9 Q	50.0	79.8%	1.0%
Bromoethane	55.5	50.0	111%	62.0	50.0	124%	11.1%
Acrylonitrile	50.7	50.0	101%	46.0	50.0	92.0%	9.7%
1,1-Dichloropropene	43.7	50.0	87.4%	47.7	50.0	95.4%	8.8%
Dibromomethane	44.2	50.0	88.4%	44.7	50.0	89.4%	1.1%
1,1,1,2-Tetrachloroethane	44.5	50.0	89.0%	46.4	50.0	92.8%	4.2%
1,2-Dibromo-3-chloropropane	43.4	50.0	86.8%	39.3	50.0	78.6%	9.9%
1,2,3-Trichloropropane	45.5	50.0	91.0%	42.5	50.0	85.0%	6.8%
trans-1,4-Dichloro-2-butene	44.4	50.0	88.8%	40.4	50.0	80.8%	9.4%
1,3,5-Trimethylbenzene	45.0	50.0	90.0%	47.6	50.0	95.2%	5.6%
1,2,4-Trimethylbenzene	44.9	50.0	89.8%	47.3	50.0	94.6%	5.2%
Hexachlorobutadiene	46.2	50.0	92.4%	48.8	50.0	97.6%	5.5%
1,2-Dibromoethane	43.7	50.0	87.4%	43.9	50.0	87.8%	0.5%
Bromochloromethane	54.8	50.0	110%	55.8	50.0	112%	1.8%
2,2-Dichloropropane	54.7	50.0	109%	61.3	50.0	123%	11.4%
1,3-Dichloropropane	40.4	50.0	80.8%	41.0	50.0	82.0%	1.5%
Isopropylbenzene	45.5	50.0	91.0%	48.1	50.0	96.2%	5.6%
n-Propylbenzene	45.0	50.0	90.0%	47.9	50.0	95.8%	6.2%
Bromobenzene	45.7	50.0	91.4%	46.9	50.0	93.8%	2.6%
2-Chlorotoluene	43.5	50.0	87.0%	45.4	50.0	90.8%	4.3%
4-Chlorotoluene	43.6	50.0	87.2%	46.4	50.0	92.8%	6.2%
tert-Butylbenzene	45.2	50.0	90.4%	47.6	50.0	95.2%	5.2%
sec-Butylbenzene	45.5	50.0	91.0%	48.2	50.0	96.4%	5.8%
4-Isopropyltoluene	46.0	50.0	92.0%	49.1	50.0	98.2%	6.5%
n-Butylbenzene	45.2	50.0	90.4%	48.5	50.0	97.0%	7.0%
1,2,4-Trichlorobenzene	47.6	50.0	95.2%	49.1	50.0	98.2%	3.1%
Naphthalene	45.5	50.0	91.0%	43.2	50.0	86.4%	5.2%
1,2,3-Trichlorobenzene	46.3	50.0	92.6%	46.1	50.0	92.2%	0.4%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d4-1,2-Dichloroethane	111%	111%
d8-Toluene	103%	102%
Bromofluorobenzene	96.0%	96.1%
d4-1,2-Dichlorobenzene	104%	102%





**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

February 26, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101

**RE: Project: Boeing Renton Apron A**  
**ARI Job: AWI9**

Dear Crystal,

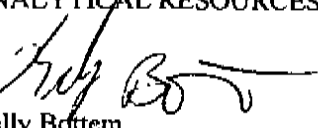
Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted four soil samples and a trip blank in good condition on February 22, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for total metals, NWTPH-Gx and NWTPH-Dx, as requested on the COC. All other analyses were logged under ARI SDG AWI8 based on client specified turn around times.

There were no anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

  
Kelly Botten  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **AW19** Turn-around Requested: **100-48hr** Tpit metals 72 hr

ARI Client Company: **AMEC** Phone: **206-838-8469**

Client Contact: **Crystal Thomsen**

Client Project Name: **Bueing Apron A**

Client Project #: **J. Bellamy**

Page: **1** of **1**

Date: **2/20/16** Ice Present? **Y**

No./of Coolers: **1** Cooler Temps: **0.8**

Analytical Resources, Incorporated  
Analytical Chemists and Consultants  
4611 South 134th Place, Suite 100  
Tukwila, WA 98168  
206-695-6200 206-695-6201 (fax)  
www.arilabs.com



Sample ID	Date	Time	Matrix	No Containers
Apron-A-17-07-000016	2/20/16	8:45	Soil	8
Apron-A-17-15-000016	↓	9:10	Soil	8
Apron-A-16-07-000016	↓	10:15	Soil	8
Apron-A-16-13-000016	↓	10:30	Soil	8
TRBBknk-000016	2/20/16	-	water	2

Analysis Requested					Notes/Comments
VOC	TPH	TPH-DX LL	Metals	PH	
X	X	X	X	X	
X	X	X	X	X	
X	X	X	X	X	
X	X	X	X	X	
X	X	X	X	X	

Comments/Special Instructions:  
\*Hold for TPH-DX w/ Siliconel swabs (AS);  
TELE metals  
SEND RESULTS TO  
Nancy Swanson  
w/BSem

Relinquished by (Signature): *Jennifer Bellamy*  
Printed Name: **Jennifer Bellamy**  
Company: **AMEC**  
Date & Time: **2/22/15 7:17**

Received by (Signature): *Jennifer Bellamy*  
Printed Name: **Jennifer Bellamy**  
Company: **AMEC**  
Date & Time: **2/22/16 7:17**

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: Breing

Project Name: Apron A

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier  Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: AWI9

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)  
 Were custody papers included with the cooler? (YES) NO  
 Were custody papers properly filled out (ink, signed, etc.) (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)  
 Time: 0.5

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DCX5276

Cooler Accepted by: AV Date: 2/22/16 Time: 7:17

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NO)  
 What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other: \_\_\_\_\_  
 Was sufficient ice used (if appropriate)? NA (YES) NO  
 Were all bottles sealed in individual plastic bags? YES (NO)  
 Did all bottles arrive in good condition (unbroken)? (YES) NO  
 Were all bottle labels complete and legible? (YES) NO  
 Did the number of containers listed on COC match with the number of containers received? (YES) NO  
 Did all bottle labels and tags agree with custody papers? (YES) NO  
 Were all bottles used correct for the requested analyses? (YES) NO  
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... (NA) YES NO  
 Were all VOC vials free of air bubbles? (NA) YES NO  
 Was sufficient amount of sample sent in each bottle? (YES) NO  
 Date VOC Trip Blank was made at ARI: \_\_\_\_\_ (NA)  
 Was Sample Split by ARI: (NA) YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: TR Date: 2-22-16 Time: 1001

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_

<p>Small Air Bubbles - 2mm</p>	<p>Peabubbles 2-4 mm</p>	<p>LARGE Air Bubbles &gt; 4 mm</p>	<p>Small → "sm" (&lt; 2 mm)          Peabubbles → "pb" (2 to &lt; 4 mm)          Large → "lg" (4 to &lt; 6 mm)          Headspace → "hs" (&gt; 6 mm)</p>
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# Sample ID Cross Reference Report



ARI Job No: AWI9  
Client: AMEC Environment & Infrastructure  
Project Event: N/A  
Project Name: Boeing Apron A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron-A-B-17-0-7-022016	AWI9A	16-2793	Soil	02/20/16 08:45	02/22/16 07:17
2. Apron-A-B-17-7-15-022016	AWI9B	16-2794	Soil	02/20/16 09:10	02/22/16 07:17
3. Apron-A-B-16-0-7-022016	AWI9C	16-2795	Soil	02/20/16 10:15	02/22/16 07:17
4. Apron-A-B-16-7-15-022016	AWI9D	16-2796	Soil	02/20/16 10:30	02/22/16 07:17

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTFHG  
Page 1 of 1

Sample ID: MB-022316A  
METHOD BLANK

Lab Sample ID: MB-022316A

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2793

Matrix: Soil

Data Release Authorized: *YMW*  
Reported: 02/24/16

Date Sampled: NA  
Date Received: NA

Instrument/Analyst: NT2/PKC  
Date Analyzed: 02/23/16 12:55

Sample Amount: 200 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: NA

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	5.0	< 5.0	U	---

Reported in mg/kg (ppm)

Volatile Surrogate Recovery

d8-Toluene	94.2%
Bromofluorobenzene	92.0%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-17-0-7-022016  
SAMPLE

Lab Sample ID: AWI9A  
LIMS ID: 16-2793  
Matrix: Soil  
Data Release Authorized: *mw*  
Reported: 02/24/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16  
Date Received: 02/22/16

Instrument/Analyst: NT2/PKC  
Date Analyzed: 02/23/16 14:07

Sample Amount: 141 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: 20.1%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	7.1	< 7.1	U	---
Reported in mg/kg (ppm)					
<b>Volatile Surrogate Recovery</b>					
	d8-Toluene		94.6%		
	Bromofluorobenzene		95.2%		

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-17-7-15-022016  
SAMPLE

Lab Sample ID: AWI9B

LIMS ID: 16-2794

Matrix: Soil

Data Release Authorized: *MW*

Reported: 02/24/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16

Date Received: 02/22/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 02/23/16 14:28

Sample Amount: 52.2 mg-dry-wt

Purge Volume: 10.0 mL

Moisture: 43.5%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	19	< 19	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	95.4%
Bromofluorobenzene	104%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-16-0-7-022016  
SAMPLE

Lab Sample ID: AWI9C  
LIMS ID: 16-2795  
Matrix: Soil  
Data Release Authorized: *MM*  
Reported: 02/24/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16  
Date Received: 02/22/16

Instrument/Analyst: NT2/PKC  
Date Analyzed: 02/23/16 14:49

Sample Amount: 123 mg-dry-wt  
Purge Volume: 10.0 mL  
Moisture: 24.0%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	8.1	< 8.1	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	96.4%
Bromofluorobenzene	105%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

**ORGANICS ANALYSIS DATA SHEET**  
**Volatiles by P&T GC/MS-Method SW8260C/NWTPHG**  
 Page 1 of 1

**Sample ID: Apron-A-B-16-7-15-022016**  
**SAMPLE**

Lab Sample ID: AWI9D  
 LIMS ID: 16-2796  
 Matrix: Soil  
 Data Release Authorized: *MMW*  
 Reported: 02/24/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

Date Sampled: 02/20/16  
 Date Received: 02/22/16

Instrument/Analyst: NT2/PKC  
 Date Analyzed: 02/23/16 15:10

Sample Amount: 49.9 mg-dry-wt  
 Purge Volume: 10.0 mL  
 Moisture: 53.5%

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
96290-81-5	Gasoline Range Hydrocarbons	20	< 20	U	---

Reported in mg/kg (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	94.0%
Bromofluorobenzene	102%

Results corrected for soil moisture content per Section 11.10.5 of EPA Method 8000C.

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-022316A	Method Blank	Med	NA	94.2%	92.0%	NA	0
LCS-022316A	Lab Control	Med	NA	98.6%	97.8%	NA	0
LCSD-022316A	Lab Control Dup	Med	NA	99.4%	97.2%	NA	0
AWI9A	Apron-A-B-17-0-7-022016	Med	NA	94.6%	95.2%	NA	0
AWI9B	Apron-A-B-17-7-15-022016	Med	NA	95.4%	104%	NA	0
AWI9C	Apron-A-B-16-0-7-022016	Med	NA	96.4%	105%	NA	0
AWI9D	Apron-A-B-16-7-15-022016	Med	NA	94.0%	102%	NA	0

SW8260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	78-151	80-124
(TOL) = d8-Toluene	77-120	80-120	80-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	75-124	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 16-2793 to 16-2796



ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: LCS-022316A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-022316A

LIMS ID: 16-2793

Matrix: Soil

Data Release Authorized: *MW*

Reported: 02/24/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Instrument/Analyst LCS: NT2/PKC

LCSD: NT2/PKC

Date Analyzed LCS: 02/23/16 12:12

LCSD: 02/23/16 12:33

Sample Amount LCS: 200 mg-dry-wt

LCSD: 200 mg-dry-wt

Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Gasoline Range Hydrocarbons	45.5	50.0	91.0%	42.0	50.0	84.0%	8.0%

Reported in mg/kg (ppm)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d8-Toluene	98.6%	99.4%
Bromofluorobenzene	97.8%	97.2%

**ORGANICS ANALYSIS DATA SHEET**  
**TOTAL DIESEL RANGE HYDROCARBONS**  
 NWTPHD by GC/FID  
 Extraction Method: SW3546  
 Page 1 of 1

QC Report No: AWI9-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

Matrix: Soil

Date Received: 02/22/16

Data Release Authorized: *MW*  
 Reported: 02/24/16

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range/Surrogate	LOQ	Result
MB-022216 16-2793	Method Blank HC ID: ---	02/22/16	02/23/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	5.0 10	< 5.0 U < 10 U 106%
AWI9A 16-2793	Apron-A-B-17-0-7-022002/22/16 HC ID: DIESEL/MOTOR OIL	02/22/16	02/23/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	6.2 12	7.9 31 92.0%
AWI9B 16-2794	Apron-A-B-17-7-15-02202/22/16 HC ID: DIESEL/MOTOR OIL	02/22/16	02/23/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	8.8 18	12 48 89.6%
AWI9C 16-2795	Apron-A-B-16-0-7-022002/22/16 HC ID: DIESEL/MOTOR OIL	02/22/16	02/23/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	6.5 13	8.2 38 96.6%
AWI9D 16-2796	Apron-A-B-16-7-15-02202/22/16 HC ID: DIESEL/MOTOR OIL	02/22/16	02/23/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	11 21	20 200 87.5%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.  
 DL-Dilution of extract prior to analysis.  
 LOQ-Limit of Quantitation

Diesel range quantitation on total peaks in the range from C12 to C24.  
 Motor Oil range quantitation on total peaks in the range from C24 to C38.  
 HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

TPHD SURROGATE RECOVERY SUMMARY

Matrix: Soil

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Client ID	OTER	TOT OUT
022216MB	106%	0
022216LCS	102%	0
Apron-A-B-17-0-7-022016	92.0%	0
Apron-A-B-17-7-15-022016	89.6%	0
Apron-A-B-16-0-7-022016	96.6%	0
Apron-A-B-16-7-15-022016	87.5%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3546  
Log Number Range: 16-2793 to 16-2796

**ORGANICS ANALYSIS DATA SHEET**  
 NWTPHD by GC/FID  
 Page 1 of 1

Sample ID: LCS-022216  
 LAB CONTROL

Lab Sample ID: LCS-022216  
 LIMS ID: 16-2793  
 Matrix: Soil  
 Data Release Authorized: *MW*  
 Reported: 02/24/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

Date Sampled: NA  
 Date Received: NA

Date Extracted: 02/22/16  
 Date Analyzed: 02/23/16 11:44  
 Instrument/Analyst: FID3D/ML

Sample Amount: 10.0 g-dry-wt  
 Final Extract Volume: 1.0 mL  
 Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	134	150	89.3%

**TPHD Surrogate Recovery**

o-Terphenyl	102%
-------------	------

Results reported in mg/kg

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Soil  
Date Received: 02/22/16

ARI Job: AWI9  
Project: Boeing Apron A

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
16-2793-022216MB1	Method Blank	10.0 g	1.00 mL	-	02/22/16
16-2793-022216LCS1	Lab Control	10.0 g	1.00 mL	-	02/22/16
16-2793-AWI9A	Apron-A-B-17-0-7-028.06 g		1.00 mL	D	02/22/16
16-2794-AWI9B	Apron-A-B-17-7-15-05.706g		1.00 mL	D	02/22/16
16-2795-AWI9C	Apron-A-B-16-0-7-027.65 g		1.00 mL	D	02/22/16
16-2796-AWI9D	Apron-A-B-16-7-15-04.686g		1.00 mL	D	02/22/16


Basis: D=Dry Weight W=As Received

AWI9: 20015

**INORGANICS ANALYSIS DATA SHEET  
TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-17-0-7-022016  
SAMPLE

Lab Sample ID: AWI9A  
LIMS ID: 16-2793  
Matrix: Soil  
Data Release Authorized:   
Reported: 02/26/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16  
Date Received: 02/22/16

Percent Total Solids: 58.8%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/23/16	200.8	02/25/16	7429-90-5	Aluminum	30	28,600	
3050B	02/23/16	200.8	02/24/16	7440-38-2	Arsenic	0.3	8.8	
3050B	02/23/16	200.8	02/24/16	7440-39-3	Barium	0.8	153	
3050B	02/23/16	200.8	02/24/16	7440-43-9	Cadmium	0.2	0.3	
3050B	02/23/16	6010C	02/24/16	7440-70-2	Calcium	8	6,800	
3050B	02/23/16	200.8	02/25/16	7440-47-3	Chromium	0.8	54.2	
3050B	02/23/16	200.8	02/24/16	7440-48-4	Cobalt	0.3	19.7	
3050B	02/23/16	200.8	02/24/16	7440-50-8	Copper	0.8	57.0	
3050B	02/23/16	200.8	02/25/16	7439-89-6	Iron	30	30,900	
3050B	02/23/16	200.8	02/24/16	7439-92-1	Lead	0.2	7.4	
3050B	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	8	10,100	
3050B	02/23/16	200.8	02/24/16	7439-98-7	Molybdenum	0.3	0.8	
3050B	02/23/16	200.8	02/24/16	7440-02-0	Nickel	0.8	59.6	
3050B	02/23/16	200.8	02/25/16	7440-22-4	Silver	0.3	0.3	U
3050B	02/23/16	200.8	02/24/16	7440-66-6	Zinc	7	83	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-17-7-15-022016  
SAMPLE

Lab Sample ID: AWI9B

LIMS ID: 16-2794

Matrix: Soil

Data Release Authorized: *EJ*

Reported: 02/26/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16

Date Received: 02/22/16

Percent Total Solids: 61.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/23/16	200.8	02/25/16	7429-90-5	Aluminum	30	25,100	
3050B	02/23/16	200.8	02/24/16	7440-38-2	Arsenic	0.3	4.4	
3050B	02/23/16	200.8	02/24/16	7440-39-3	Barium	0.8	141	
3050B	02/23/16	200.8	02/24/16	7440-43-9	Cadmium	0.2	0.2	U
3050B	02/23/16	6010C	02/24/16	7440-70-2	Calcium	8	5,550	
3050B	02/23/16	200.8	02/24/16	7440-47-3	Chromium	0.8	39.9	
3050B	02/23/16	200.8	02/24/16	7440-48-4	Cobalt	0.3	11.7	
3050B	02/23/16	200.8	02/24/16	7440-50-8	Copper	0.8	34.6	
3050B	02/23/16	200.8	02/25/16	7439-89-6	Iron	30	25,700	
3050B	02/23/16	200.8	02/24/16	7439-92-1	Lead	0.2	5.3	
3050B	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	8	7,100	
3050B	02/23/16	200.8	02/24/16	7439-98-7	Molybdenum	0.3	0.3	U
3050B	02/23/16	200.8	02/24/16	7440-02-0	Nickel	0.8	37.2	
3050B	02/23/16	200.8	02/25/16	7440-22-4	Silver	0.3	0.3	U
3050B	02/23/16	200.8	02/24/16	7440-66-6	Zinc	6	52	

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation



**INORGANICS ANALYSIS DATA SHEET**  
**TOTAL METALS**  
 Page 1 of 1

Sample ID: Apron-A-B-16-0-7-022016  
 SAMPLE

Lab Sample ID: AWI9C  
 LIMS ID: 16-2795  
 Matrix: Soil  
 Data Release Authorized:  
 Reported: 02/26/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

Date Sampled: 02/20/16  
 Date Received: 02/22/16

Percent Total Solids: 80.3%

Prep Math	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/23/16	200.8	02/25/16	7429-90-5	Aluminum	20	17,900	
3050B	02/23/16	200.8	02/24/16	7440-38-2	Arsenic	0.2	4.7	
3050B	02/23/16	200.8	02/24/16	7440-39-3	Barium	0.6	96.4	
3050B	02/23/16	200.8	02/24/16	7440-43-9	Cadmium	0.1	0.2	
3050B	02/23/16	6010C	02/24/16	7440-70-2	Calcium	6	5,440	
3050B	02/23/16	200.8	02/24/16	7440-47-3	Chromium	0.6	32.9	
3050B	02/23/16	200.8	02/24/16	7440-48-4	Cobalt	0.2	9.6	
3050B	02/23/16	200.8	02/24/16	7440-50-8	Copper	0.6	27.1	
3050B	02/23/16	200.8	02/24/16	7439-89-6	Iron	20	18,500	
3050B	02/23/16	200.8	02/24/16	7439-92-1	Lead	0.1	4.1	
3050B	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	6	8,030	
3050B	02/23/16	200.8	02/24/16	7439-98-7	Molybdenum	0.2	0.3	
3050B	02/23/16	200.8	02/24/16	7440-02-0	Nickel	0.6	36.1	
3050B	02/23/16	200.8	02/25/16	7440-22-4	Silver	0.2	0.2	U
3050B	02/23/16	200.8	02/24/16	7440-66-6	Zinc	5	50	

U-Analyte undetected at given LOQ  
 LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1


Sample ID: Apron-A-B-16-7-15-022016

**SAMPLE**

Lab Sample ID: AWI9D

LIMS ID: 16-2796

Matrix: Soil

Data Release Authorized: 

Reported: 02/26/16

QC Report No: AWI9-AMEC Environment & Infrastructure

Project: Boeing Apron A

Date Sampled: 02/20/16

Date Received: 02/22/16

Percent Total Solids: 43.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/23/16	200.8	02/25/16	7429-90-5	Aluminum	40	17,100	
3050B	02/23/16	200.8	02/24/16	7440-38-2	Arsenic	0.4	4.9	
3050B	02/23/16	200.8	02/24/16	7440-39-3	Barium	1	94	
3050B	02/23/16	200.8	02/24/16	7440-43-9	Cadmium	0.2	0.2	U
3050B	02/23/16	6010C	02/24/16	7440-70-2	Calcium	10	4,460	
3050B	02/23/16	200.8	02/24/16	7440-47-3	Chromium	1	28	
3050B	02/23/16	200.8	02/24/16	7440-48-4	Cobalt	0.4	8.2	
3050B	02/23/16	200.8	02/24/16	7440-50-8	Copper	1	21	
3050B	02/23/16	200.8	02/25/16	7439-89-6	Iron	40	18,300	
3050B	02/23/16	200.8	02/24/16	7439-92-1	Lead	0.2	3.7	
3050B	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	10	3,970	
3050B	02/23/16	200.8	02/24/16	7439-98-7	Molybdenum	0.4	0.5	
3050B	02/23/16	200.8	02/24/16	7440-02-0	Nickel	1	25	
3050B	02/23/16	200.8	02/25/16	7440-22-4	Silver	0.4	0.4	U
3050B	02/23/16	200.8	02/24/16	7440-66-6	Zinc	9	29	

U-Analyte undetected at given LOQ

LOQ-Limit of Quantitation



INORGANICS ANALYSIS DATA SHEET

TOTAL METALS  
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: AWI9MB  
LIMS ID: 16-2796  
Matrix: Soil  
Data Release Authorized: *[Signature]*  
Reported: 02/26/16

QC Report No: AWI9-AMEC Environment & Infrastructure  
Project: Boeing Apron A  
Date Sampled: NA  
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/kg-dry	Q
3050B	02/23/16	200.8	02/25/16	7429-90-5	Aluminum	20	20	U
3050B	02/23/16	200.8	02/24/16	7440-38-2	Arsenic	0.2	0.2	U
3050B	02/23/16	200.8	02/24/16	7440-39-3	Barium	0.5	0.5	U
3050B	02/23/16	200.8	02/24/16	7440-43-9	Cadmium	0.1	0.1	U
3050B	02/23/16	6010C	02/24/16	7440-70-2	Calcium	5	5	U
3050B	02/23/16	200.8	02/24/16	7440-47-3	Chromium	0.5	0.5	U
3050B	02/23/16	200.8	02/24/16	7440-48-4	Cobalt	0.2	0.2	U
3050B	02/23/16	200.8	02/24/16	7440-50-8	Copper	0.5	0.5	U
3050B	02/23/16	200.8	02/24/16	7439-89-6	Iron	20	20	U
3050B	02/23/16	200.8	02/24/16	7439-92-1	Lead	0.1	0.1	U
3050B	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	5	5	U
3050B	02/23/16	200.8	02/24/16	7439-98-7	Molybdenum	0.2	0.2	U
3050B	02/23/16	200.8	02/24/16	7440-02-0	Nickel	0.5	0.5	U
3050B	02/23/16	200.8	02/25/16	7440-22-4	Silver	0.2	0.2	U
3050B	02/23/16	200.8	02/24/16	7440-66-6	Zinc	4	4	U

U-Analyte undetected at given LOQ  
LOQ-Limit of Quantitation

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: AWI9LCS

LIMS ID: 16-2796

Matrix: Soil

Data Release Authorized:

Reported: 02/26/16



QC Report No: AWI9-AMEC Environment & Infrastructure

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	200.8	520	500	104%	
Arsenic	200.8	27.2	25.0	109%	
Barium	200.8	29.1	25.0	116%	
Cadmium	200.8	26.2	25.0	105%	
Calcium	6010C	986	1000	98.6%	
Chromium	200.8	27.5	25.0	110%	
Cobalt	200.8	27.6	25.0	110%	
Copper	200.8	27.8	25.0	111%	
Iron	200.8	490	500	98.0%	
Lead	200.8	27.1	25.0	108%	
Magnesium	6010C	1060	1000	106%	
Molybdenum	200.8	23.7	25.0	94.8%	
Nickel	200.8	27.3	25.0	109%	
Silver	200.8	29.2	25.0	117%	
Zinc	200.8	89	80	111%	

Reported in mg/kg-dry

N-Control limit not met

NA-Not Applicable, Analyte Not Spiked

Control Limits: 80-120%



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

February 24, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101

**RE: Project: Boeing Renton Apron A**  
**ARI Job: AWJ1**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted two water samples and a trip blank in good condition on February 22, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for VOCs on a rush turn around time, as requested on the COC. All other analyses were logged under a different ARI SDG based on client specified turn around times.

The VOCs CCAL is out of control low for all associated FORM III "Q" flagged analytes. All associated samples that contain analyte have been flagged with a "Q" qualifier.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

A handwritten signature in black ink, appearing to read "Kelly Bottem".

Kelly Bottem  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: AWJ1  
 Turn-around Requested: VOC-4eur, TPH+metals-7ahr  
 ARI Client Company: AMEL  
 Phone: 206-833-8469  
 Client Contact: Crystal Thimser  
 Client Project Name: Boeing Apron A  
 Client Project #: Sibellamy

Page: 1 of 1  
 Date: 2/20/16  
 Ice Present? Y  
 No. of Coolers: 1  
 Cooler Temps: 0.8

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					MTPH-D	VOCs	EM-BOD	PAHs	
Apron-A-B-17-GW	2/20/16	9:40	Water	6	X	X	X	X	
Apron-A-B-16-GW	↓	11:00	↓	6	X	X	X	X	
Trip Blank-22016	↓	-	↓	2	X	X	X	X	
<i>[Handwritten signature]</i>									
Comments/Special Instructions *Hole transition guvaxon - send results to Doris Turner Sibellamy	Relinquished by: (Signature) <i>[Signature]</i> Printed Name: <u>Jeanette Bell</u> Company: <u>AMEL</u> Date & Time: <u>2/20/16 2:17</u>				Received by: (Signature) <i>[Signature]</i> Printed Name: <u>A. Odgardson</u> Company: <u>ARI</u> Date & Time: <u>2/22/16 7:17</u>				

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: Breing

Project Name: Apron A

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: AWJ1

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? ..... (YES) NO

Were custody papers properly filled out (ink, signed, etc.) ..... (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: \_\_\_\_\_ 0.8

If cooler temperature is out of compliance fill out form Q0070F

Temp Gun ID#: DOCS276

Cooler Accepted by: AV Date: 2/22/16 Time: 7:17

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA (YES) NO

Were all bottles sealed in individual plastic bags? ..... YES (NO)

Did all bottles arrive in good condition (unbroken)? ..... YES (NO)

Were all bottle labels complete and legible? ..... (YES) NO

Did the number of containers listed on COC match with the number of containers received? ..... (YES) NO

Did all bottle labels and tags agree with custody papers? ..... (YES) NO

Were all bottles used correct for the requested analyses? ..... (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... TR (YES) (NO)

Were all VOC vials free of air bubbles? ..... NA (YES) NO

Was sufficient amount of sample sent in each bottle? ..... NA (YES) NO

Date VOC Trip Blank was made at ARI ..... (NA)

Was Sample Split by ARI: (NA) YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: TR Date: 2-22-16 Time: 1058

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

1 of 3 vials for sample Apron-A-B-16-GW was broken upon arrival.

By: \_\_\_\_\_ Date: \_\_\_\_\_

<p>Small Air Bubbles → 2mm</p>	<p>Peabubbles 2-4 mm</p>	<p>LARGE Air Bubbles &gt; 4 mm</p>	<p>Small → "sm" (&lt; 2 mm)</p> <p>Peabubbles → "pb" (2 to &lt; 4 mm)</p> <p>Large → "lg" (4 to &lt; 6 mm)</p> <p>Headspace → "hs" (&gt; 6 mm)</p>
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# Sample ID Cross Reference Report



ARI Job No: AWJ1  
Client: AMEC Environment & Infrastructure  
Project Event: N/A  
Project Name: Boeing Apron A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron-A-B-17-GW	AWJ1A	16-2799	Water	02/20/16 09:40	02/22/16 07:17
2. Apron-A-B-16-GW	AWJ1B	16-2800	Water	02/20/16 11:00	02/22/16 07:17

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B-17-GW  
SAMPLE

Lab Sample ID: AWJ1A  
LIMS ID: 16-2799  
Matrix: Water

QC Report No: AWJ1-AMFC Environment & Infrastructure  
Project: Boeing Apron A

Data Release Authorized: *TWJ*  
Reported: 02/24/16

Date Sampled: 02/20/16  
Date Received: 02/22/16

Instrument/Analyst: NT3/LH  
Date Analyzed: 02/22/16 14:16

Sample Amount: 10.0 mL  
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	8.4	
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U



Sample ID: Apron-A-B-17-GW  
 SAMPLE

Lab Sample ID: AWJ1A  
 LIMS ID: 16-2799  
 Matrix: Water  
 Date Analyzed: 02/22/16 14:16

QC Report No: AWJ1-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	103%
d8-Toluene	96.6%
Bromofluorobenzene	97.6%
d4-1,2-Dichlorobenzene	105%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Apron-A-B-16-GW  
SAMPLE

Lab Sample ID: AWJ1B  
LIMS ID: 16-2800  
Matrix: Water  
Data Release Authorized: *WVW*  
Reported: 02/24/16

QC Report No: AWJ1-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16  
Date Received: 02/22/16

Instrument/Analyst: NT3/LH  
Date Analyzed: 02/22/16 20:45

Sample Amount: 10.0 mL  
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	<b>Acetone</b>	<b>5.0</b>	<b>11</b>	
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C  
Page 2 of 2



Sample ID: Apron-A-B-16-GW  
SAMPLE

Lab Sample ID: AWJ1B  
LIMS ID: 16-2800  
Matrix: Water  
Date Analyzed: 02/22/16 20:45

QC Report No: AWJ1-AMEC Environment & Infrastructure  
Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromochloroethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromoethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	106%
d8-Toluene	97.4%
Bromofluorobenzene	97.2%
d4-1,2-Dichlorobenzene	106%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: MB-022216A

METHOD BLANK

Lab Sample ID: MB-022216A

LIMS ID: 16-2799

Matrix: Water

Data Release Authorized: *W*

Reported: 02/24/16

QC Report No: AWJ1-AMEC Environment & Infrastructure

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Instrument/Analyst: NT3/LH

Date Analyzed: 02/22/16 12:31

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

Page 2 of 2



Sample ID: MB-022216A

METHOD BLANK

Lab Sample ID: MB-022216A

LIMS ID: 16-2799

Matrix: Water

Date Analyzed: 02/22/16 12:31

QC Report No: AWJ1-AMEC Environment & Infrastructure  
Project: Boeing Apron A

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromooctane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	98.2%
d8-Toluene	98.2%
Bromofluorobenzene	96.0%
d4-1,2-Dichlorobenzene	104%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AWJ1-AMEC Environment & Infrastructure  
Project: Boeing Apron A

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-022216A	Method Blank	10	98.2%	98.2%	96.0%	104%	0
LCS-022216A	Lab Control	10	98.8%	102%	105%	99.4%	0
LCSD-022216A	Lab Control Dup	10	97.2%	99.4%	102%	103%	0
AWJ1A	Apron-A-B-17-GW	10	103%	96.6%	97.6%	105%	0
AWJ1B	Apron-A-B-16-GW	10	106%	97.4%	97.2%	106%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane	(80-129)	(80-129)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B  
Log Number Range: 16-2799 to 16-2800

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2



Sample ID: LCS-022216A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-022216A

LIMS ID: 16-2799

Matrix: Water

Data Release Authorized: *TW*

Reported: 02/24/16

QC Report No: AWJ1-AMEC Environment & Infrastructure

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Instrument/Analyst LCS: NT3/LH

LCSD: NT3/LH

Date Analyzed LCS: 02/22/16 11:12

LCSD: 02/22/16 11:39

Sample Amount LCS: 10.0 mL

LCSD: 10.0 mL

Purge Volume LCS: 10.0 mL

LCSD: 10.0 mL

Analyte	LCS	Spike		LCS		LCSD		RPD
		Added-LCS	Recovery	Added-LCS	Recovery	Added-LCSD	Recovery	
Chloromethane	10.2	10.0	102%	9.88	10.0	98.8%	3.2%	
Bromomethane	10.1	10.0	101%	9.60	10.0	96.0%	5.1%	
Vinyl Chloride	10.0	10.0	100%	9.92	10.0	99.2%	0.8%	
Chloroethane	10.3	10.0	103%	9.75	10.0	97.5%	5.5%	
Methylene Chloride	9.68	10.0	96.8%	9.21	10.0	92.1%	5.0%	
Acetone	51.5	50.0	103%	50.0	50.0	100%	3.0%	
Carbon Disulfide	10.1	10.0	101%	9.88	10.0	98.8%	2.2%	
1,1-Dichloroethene	10.1	10.0	101%	9.73	10.0	97.3%	3.7%	
1,1-Dichloroethane	9.98	10.0	99.8%	9.63	10.0	96.3%	3.6%	
trans-1,2-Dichloroethene	10.0	10.0	100%	10.0	10.0	100%	0.0%	
cis-1,2-Dichloroethene	9.80	10.0	98.0%	9.56	10.0	95.6%	2.5%	
Chloroform	9.93	10.0	99.3%	9.45	10.0	94.5%	5.0%	
1,2-Dichloroethane	9.79	10.0	97.9%	9.65	10.0	96.5%	1.4%	
2-Butanone	51.6	50.0	103%	52.0	50.0	104%	0.8%	
1,1,1-Trichloroethane	9.87	10.0	98.7%	9.62	10.0	96.2%	2.6%	
Carbon Tetrachloride	10.2	10.0	102%	10.1	10.0	101%	1.0%	
Vinyl Acetate	9.79	10.0	97.9%	9.60	10.0	96.0%	2.0%	
Bromodichloromethane	10.0	10.0	100%	9.74	10.0	97.4%	2.6%	
1,2-Dichloropropane	10.1	10.0	101%	9.91	10.0	99.1%	1.9%	
cis-1,3-Dichloropropene	10.2	10.0	102%	9.98	10.0	99.8%	2.2%	
Trichloroethene	10.6	10.0	106%	10.1	10.0	101%	4.8%	
Dibromochloromethane	10.3	10.0	103%	10.1	10.0	101%	2.0%	
1,1,2-Trichloroethane	10.2	10.0	102%	9.83	10.0	98.3%	3.7%	
Benzene	10.2	10.0	102%	10.0	10.0	100%	2.0%	
trans-1,3-Dichloropropene	9.89	10.0	98.9%	9.83	10.0	98.3%	0.6%	
2-Chloroethylvinylether	9.72	10.0	97.2%	9.94	10.0	99.4%	2.2%	
Bromoform	9.88	10.0	98.8%	9.97	10.0	99.7%	0.9%	
4-Methyl-2-Pentanone (MIBK)	50.8	50.0	102%	50.7	50.0	101%	0.2%	
2-Hexanone	52.7	50.0	105%	52.4	50.0	105%	0.6%	
Tetrachloroethene	10.2	10.0	102%	9.85	10.0	98.5%	3.5%	
1,1,2,2-Tetrachloroethane	9.64	10.0	96.4%	9.71	10.0	97.1%	0.7%	
Toluene	10.2	10.0	102%	9.85	10.0	98.5%	3.5%	
Chlorobenzene	10.0	10.0	100%	9.78	10.0	97.8%	2.2%	
Ethylbenzene	10.0	10.0	100%	9.71	10.0	97.1%	2.9%	
Styrene	10.6	10.0	106%	9.97	10.0	99.7%	6.1%	
Trichlorofluoromethane	10.7	10.0	107%	9.96	10.0	99.6%	7.2%	
1,1,2-Trichloro-1,2,2-trifluoroethane	10.2	10.0	102%	9.74	10.0	97.4%	4.6%	
m,p-Xylene	20.0	20.0	100%	19.9	20.0	99.5%	0.5%	

Lab Sample ID: LCS-022216A  
 LIMS ID: 16-2799  
 Matrix: Water

QC Report No: AWJ1-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCS LCS	Spike Added-LCS	LCS Recovery	RPD
o-Xylene	9.90	10.0	99.0%	9.42	10.0	94.2%	5.0%
1,2-Dichlorobenzene	9.50	10.0	95.0%	9.43	10.0	94.3%	0.7%
1,3-Dichlorobenzene	9.81	10.0	98.1%	9.63	10.0	96.3%	1.9%
1,4-Dichlorobenzene	9.61	10.0	96.1%	9.49	10.0	94.9%	1.3%
Acrolein	49.4	50.0	98.8%	52.4	50.0	105%	5.9%
Iodomethane	10.6	10.0	106%	9.07	10.0	98.7%	7.1%
Bromoethane	10.1	10.0	101%	9.88	10.0	98.8%	2.2%
Acrylonitrile	10.6	10.0	106%	10.5	10.0	105%	0.9%
1,1-Dichloropropene	9.69	10.0	96.9%	9.64	10.0	96.4%	0.5%
Dibromomethane	10.0	10.0	100%	9.81	10.0	98.1%	1.9%
1,1,1,2-Tetrachloroethane	9.97	10.0	99.7%	9.87	10.0	98.7%	1.0%
1,2-Dibromo-3-chloropropane	8.81 Q	10.0	88.1%	9.01 Q	10.0	90.1%	2.2%
1,2,3-Trichloropropane	9.16	10.0	91.6%	9.55	10.0	95.5%	4.2%
trans-1,4-Dichloro-2-butene	9.70	10.0	97.0%	9.99	10.0	99.9%	2.9%
1,3,5-Trimethylbenzene	9.86	10.0	98.6%	9.86	10.0	98.6%	0.0%
1,2,4-Trimethylbenzene	9.93	10.0	99.3%	9.77	10.0	97.7%	1.6%
Hexachlorobutadiene	8.49	10.0	84.9%	8.22	10.0	82.2%	3.2%
1,2-Dibromoethane	10.2	10.0	102%	10.2	10.0	102%	0.0%
Bromochloromethane	10.3	10.0	103%	9.80	10.0	98.0%	5.0%
2,2-Dichloropropane	10.0	10.0	100%	9.79	10.0	97.9%	2.1%
1,3-Dichloropropane	9.75	10.0	97.5%	9.63	10.0	96.3%	1.2%
Isopropylbenzene	9.84	10.0	98.4%	9.77	10.0	97.7%	0.7%
n-Propylbenzene	9.74	10.0	97.4%	9.64	10.0	96.4%	1.0%
Bromobenzene	9.53	10.0	95.3%	9.55	10.0	95.5%	0.2%
2-Chlorotoluene	9.52	10.0	95.2%	9.41	10.0	94.1%	1.2%
4-Chlorotoluene	10.3	10.0	103%	10.2	10.0	102%	1.0%
tert-Butylbenzene	9.74	10.0	97.4%	9.53	10.0	95.3%	2.2%
sec-Butylbenzene	9.85	10.0	98.5%	9.77	10.0	97.7%	0.8%
4-Isopropyltoluene	9.83	10.0	98.3%	9.71	10.0	97.1%	1.2%
n-Butylbenzene	9.64	10.0	96.4%	9.36	10.0	93.6%	2.9%
1,2,4-Trichlorobenzene	8.54 Q	10.0	85.4%	8.89 Q	10.0	88.9%	4.0%
Naphthalene	7.67 Q	10.0	76.7%	7.87 Q	10.0	78.7%	2.6%
1,2,3-Trichlorobenzene	7.89 Q	10.0	78.9%	8.08 Q	10.0	80.8%	2.4%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCS
d4-1,2-Dichloroethane	98.8%	97.2%
d8-Toluene	102%	99.4%
Bromofluorobenzene	105%	102%
d4-1,2-Dichlorobenzene	99.4%	103%



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

February 25, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101



**RE: Project: Boeing Renton Apron A**  
**ARI Job: AWJ2**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted two water samples and a trip blank in good condition on February 22, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for Total Metals, NWTPH-Gx and NWTPH-Dx, as requested on the COC. The VOCs were logged under ARI SDG AWJ1 based on client specified turn around times.

There were no anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Kelly Bottom  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: **AWJZ**  
 Turn-around Requested: **VOG-424R, TPIT+matrix-72hr**  
 ARI Client Company: **AMEC**  
 Phone: **206-838-8469**  
 Client Contact: **Crystal Thimser**  
 Client Project Name: **Boeing Apron A**  
 Client Project #: **Sibellamy**

Page: **1** of **1**  
 Date: **2/20/16**  
 No. of Coolers: **1**  
 Ice Present? **Y**  
 Cooler Temps: **0.8**

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					NUPT-DV	LL w/low silica gel	VOCS	EMT-BOD	
Apron-A-B-17-GW	2/16/16	9:40	water	6	X	X	X	X	
Apron-A-B-16-GW	↓	11:00	↓	6	X	X	X	X	
Trip Blank-022016	↓	-	↓	2	X	X	X	X	
<i>John Bell</i>									
Comments/Special Instructions *Hole for shoring - send results to Dan's Turner Boeing	Requisitioned by: (Signature) <i>John Bell</i> Printed Name: <b>John Bell</b> Company: <b>AMEC</b> Date & Time: <b>2/20/16 2:17</b>				Received by: (Signature) <i>Annegardson</i> Printed Name: <b>Annegardson</b> Company: <b>ARI</b> Date & Time: <b>2/20/16 7:17</b>				

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: Breing

Project Name: Apron A

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: AWJ2

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES (NO)

Were custody papers included with the cooler? YES (YES) NO

Were custody papers properly filled out (ink, signed, etc.) YES (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) Time: 0.8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DCS-376

Cooler Accepted by: AV Date: 2/22/16 Time: 7:17

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? NA YES (YES) NO

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? YES (NO)

Were all bottle labels complete and legible? YES (YES) NO

Did the number of containers listed on COC match with the number of containers received? YES (YES) NO

Did all bottle labels and tags agree with custody papers? YES (YES) NO

Were all bottles used correct for the requested analyses? YES (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES (YES) NO

Were all VOC vials free of air bubbles? NA (NA) YES (YES) NO

Was sufficient amount of sample sent in each bottle? YES (YES) NO

Date VOC Trip Blank was made at ARI: NA (NA)

Was Sample Split by ARI: NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: TR Date: 2-22-16 Time: 11:16

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**

1 of 2 500ml Amber Glass containers for sample Apron-A-B-16-GW was broken upon arrival.

By: TR Date: 2-22-16

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)

# Sample ID Cross Reference Report

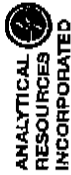


ARI Job No: AWJ2  
Client: AMEC Environment & Infrastructure  
Project Event: N/A  
Project Name: Boeing Apron A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. Apron-A-B-17-GW	AWJ2A	16-2801	Water	02/20/16 09:40	02/22/16 07:17
2. Apron-A-B-16-GW	AWJ2B	16-2802	Water	02/20/16 11:00	02/22/16 07:17

**PRESERVATION VERIFICATION 02/22/16**

Page 1 of 1



ARI Job No: AWJ2

PC: Kelly  
VTSR: 02/22/16

Inquiry Number: NONE  
Analysis Requested: 02/22/16  
Contact: Thimsen, Crystal  
Client: AMEC Environment & Infrastructure  
Logged by: TR  
Sample Set Used: Yes-481  
Validatable Package: No  
Deliverables:

Project #:   
Project: Boeing Apron A  
Sample Site:   
SDG No:   
Analytical Protocol: In-house

LOGNUM	ARI ID	CLIENT ID	CR	WAD	RH3	COD	FOG	MET	PHEN	PHOS	TKN	NO23	TCC	S2	TPHD	Fe2+	DMET DOC	FLT	FLT	PARAMETER	ADJUSTED TC	LCT NUMBER	AMOUNT ADDED	DATE/BY
16-2801	AWJ2A	Apron-A-3-17-GK	>12	>12	<2	<2	<2	TOT	<2	<2	<2	<2	<2	>9	<2	<2								
16-2802	AWJ2B	Apron-A-B-16-GW						TOT																

Checked By TR Date 2-22-16

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-17-GW  
SAMPLE

Lab Sample ID: AWJ2A

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2801

Matrix: Water

Data Release Authorized: *MW*

Date Sampled: 02/20/16

Reported: 02/24/16

Date Received: 02/22/16

Instrument/Analyst: NT2/PKC

Sample Amount: 10.0 mL

Date Analyzed: 02/23/16 16:14

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	0.10	< 0.10	U	---
Reported in mg/L (ppm)					
<b>Volatile Surrogate Recovery</b>					
	d8-Toluene		94.8%		
	Bromofluorobenzene		91.2%		

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: Apron-A-B-16-GW  
SAMPLE

Lab Sample ID: AWJ2B

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Bicing Apron A

LIMS ID: 16-2802

Matrix: Water

Data Release Authorized: *MMW*

Date Sampled: 02/20/16

Reported: 02/24/16

Date Received: 02/22/16

Instrument/Analyst: NT2/PKC

Sample Amount: 10.0 mL

Date Analyzed: 02/23/16 16:36

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHC ID
86290-81-5	Gasoline Range Hydrocarbons	0.10	< 0.10	U	---
Reported in mg/L (ppm)					
<b>Volatile Surrogate Recovery</b>					
	d8-Toluene		94.4%		
	Bromofluorobenzene		92.8%		

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 11

Sample ID: MB-022316A

Lab Sample ID: MB-022316A

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2801

Matrix: Water

Date Sampled: NA

Data Release Authorized: *TW*

Date Received: NA

Reported: 02/24/16

Instrument/Analyst: NT2/PKC

Sample Amount: 10.0 mL

Date Analyzed: 02/23/16 12:55

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q	TPHG ID
86290-81-5	Gasoline Range Hydrocarbons	0.10	< 0.10	U	---

Reported in mg/L (ppm)

**Volatile Surrogate Recovery**

d8-Toluene	94.2%
Bromofluorobenzene	92.0%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-022316A	Method Blank	10	NA	94.2%	92.0%	NA	0
LCS-022316A	Lab Control	10	NA	98.6%	97.8%	NA	0
LCSD-022316A	Lab Control Dup	10	NA	99.4%	97.2%	NA	0
AWJ2A	Apron-A-B-17-GW	10	NA	94.8%	91.2%	NA	0
AWJ2B	Apron-A-B-16-GW	10	NA	94.4%	92.8%	NA	0

LCS/MB LIMITS

QC LIMITS

(DCE) = d4-1,2-Dichloroethane	(80-129)	(80-129)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B  
Log Number Range: 16-2801 to 16-2802

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C/NWTPHG  
Page 1 of 1

Sample ID: LCS-022316A  
LAB CONTROL SAMPLE

Lab Sample ID: LCS-022316A

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

LIMS ID: 16-2801

Matrix: Water

Date Sampled: NA

Data Release Authorized: *MMW*

Date Received: NA

Reported: 02/24/16

Instrument/Analyst LCS: NT2/PKC

Sample Amount LCS: 10.0 mL

LCS: NT2/PKC

LCS: 10.0 mL

Date Analyzed LCS: 02/23/16 12:12

Purge Volume LCS: 10.0 mL

LCS: 02/23/16 12:33

LCS: 10.0 mL

Analyte	Spike		LCS		Spike		RPD
	LCS	Added-LCS	Recovery	LCS	Added-LCS	Recovery	
Gasoline Range Hydrocarbons	0.91	1.00	91.0%	0.84	1.00	84.0%	8.0%

Reported in mg/L (ppm)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCS
d8-Toluene	98.6%	99.4%
Bromofluorobenzene	97.8%	97.2%

ORGANICS ANALYSIS DATA SHEET  
TOTAL DIESEL RANGE HYDROCARBONS  
NWTPHD by GC/FID  
Extraction Method: SW3510C  
Page 1 of 1

QC Report No: AWJ2-AMEC Environment & Infrac  
Project: Boeing Apron A

Matrix: Water

Date Received: 02/22/16

Data Release Authorized: *MW*  
Reported: 02/25/16

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DF	Range/Surrogate	RL	Result
MB-022216 16-2801	Method Blank HC ID: ---	02/22/16	02/24/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	0.10 0.20	< 0.10 U < 0.20 U 99.0%
AWJ2A 16-2801	Apron-A-B-17-GW HC ID: MOTOR OIL	02/22/16	02/24/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	0.10 0.20	< 0.10 U <b>0.26</b> 59.4%
AWJ2B 16-2802	Apron-A-B-16-GW HC ID: DIESEL	02/22/16	02/24/16 FID3B	1.00 1.0	Diesel Range Motor Oil Range o-Terphenyl	0.10 0.20	<b>0.14</b> < 0.20 U 60.2%

Reported in mg/L (ppm)

EFV-Effective Final Volume in mL.  
DL-Dilution of extract prior to analysis.  
RL-Reporting limit.

Diesel range quantitation on total peaks in the range from C12 to C24.  
Motor Oil range quantitation on total peaks in the range from C24 to C38.  
HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

**TPHD SURROGATE RECOVERY SUMMARY**

Matrix: Water

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
MB-022216	99.0%	0
LCS-022216	99.3%	0
Apron-A-B-17-GW	59.4%	0
Apron-A-B-16-GW	60.2%	0

<u>LCS/MB LIMITS</u>	<u>QC LIMITS</u>
(50-150)	(50-150)

(OTER) = o-Terphenyl

Prep Method: SW3510C  
Log Number Range: 16-2801 to 16-2802



ORGANICS ANALYSIS DATA SHEET  
 NWTPHD by GC/FID  
 Page 1 of 1

Sample ID: LCS-022216  
 LAB CONTROL

Lab Sample ID: LCS-022216  
 LIMS ID: 16-2801  
 Matrix: Water  
 Data Release Authorized: *MMW*  
 Reported: 02/25/16

QC Report No: AWJ2-AMEC Environment & Infrastructure  
 Project: Boeing Apron A

Date Sampled: NA  
 Date Received: NA

Date Extracted: 02/22/16  
 Date Analyzed: 02/24/16 14:17  
 Instrument/Analyst: FID3B/ML

Sample Amount: 500 mL  
 Final Extract Volume: 1.0 mL  
 Dilution Factor: 1.00

Range	Lab Control	Spike Added	Recovery
Diesel	2.57	3.00	85.7%

TPHD Surrogate Recovery

o-Terphenyl	99.3%
-------------	-------

Results reported in mg/L

**TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT**

Matrix: Water

ARI Job: AWJ2

Date Received: 02/22/16

Project: Boeing Apron A

ARI ID	Client ID	Samp Amt	Final Vol	Prep Date
16-2801-022216MB1	Method Blank	500 mL	1.00 mL	02/22/16
16-2801-022216LCS1	Lab Control	500 mL	1.00 mL	02/22/16
16-2801-AWJ2A	Apron-A-B-17-GW	500 mL	1.00 mL	02/22/16
16-2802-AWJ2B	Apron-A-B-16-GW	500 mL	1.00 mL	02/22/16

**INORGANICS ANALYSIS DATA SHEET**

TOTAL METALS


Page 1 of 1

Sample ID: Apron-A-B-17-GW  
SAMPLE

Lab Sample ID: AWJZA

LIMS ID: 16-2801

Matrix: Water

Data Release Authorized: 

Reported: 02/25/16

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16

Date Received: 02/22/16

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
3010A	02/23/16	6010C	02/24/16	7429-90-5	Aluminum	0.05	147	
3010A	02/23/16	6010C	02/24/16	7440-38-2	Arsenic	0.05	0.06	
3010A	02/23/16	6010C	02/24/16	7440-39-3	Barium	0.003	0.738	
3010A	02/23/16	6010C	02/24/16	7440-43-9	Cadmium	0.002	0.002	U
3010A	02/23/16	6010C	02/24/16	7440-70-2	Calcium	0.05	50.2	
3010A	02/23/16	6010C	02/24/16	7440-47-3	Chromium	0.005	0.303	
3010A	02/23/16	6010C	02/24/16	7440-48-4	Cobalt	0.003	0.079	
3010A	02/23/16	6010C	02/24/16	7440-50-8	Copper	0.002	0.276	
3010A	02/23/16	6010C	02/24/16	7439-89-6	Iron	0.05	188	
3010A	02/23/16	6010C	02/24/16	7439-92-1	Lead	0.02	0.04	
3010A	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	0.05	50.3	
3010A	02/23/16	6010C	02/24/16	7439-98-7	Molybdenum	0.005	0.018	
3010A	02/23/16	6010C	02/24/16	7440-02-0	Nickel	0.01	0.29	
3010A	02/23/16	6010C	02/24/16	7440-22-4	Silver	0.003	0.003	U
3010A	02/23/16	6010C	02/24/16	7440-66-6	Zinc	0.01	0.48	

U-Analyte undetected at given LOQ  
LOQ-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: Apron-A-B-16-GW  
SAMPLE

Lab Sample ID: AWJ2B

LIMS ID: 16-2802

Matrix: Water

Data Release Authorized: *EF*

Reported: 02/25/16

QC Report No: AWJ2-AMEC Environment & Infrastructure  
Project: Boeing Apron A

Date Sampled: 02/20/16

Date Received: 02/22/16

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
3010A	02/23/16	6010C	02/24/16	7429-90-5	Aluminum	0.05	41.2	
3010A	02/23/16	6010C	02/24/16	7440-38-2	Arsenic	0.05	0.05	U
3010A	02/23/16	6010C	02/24/16	7440-39-3	Barium	0.003	0.242	
3010A	02/23/16	6010C	02/24/16	7440-43-9	Cadmium	0.002	0.002	U
3010A	02/23/16	6010C	02/24/16	7440-70-2	Calcium	0.05	50.8	
3010A	02/23/16	6010C	02/24/16	7440-47-3	Chromium	0.005	0.078	
3010A	02/23/16	6010C	02/24/16	7440-48-4	Cobalt	0.003	0.023	
3010A	02/23/16	6010C	02/24/16	7440-50-8	Copper	0.002	0.077	
3010A	02/23/16	6010C	02/24/16	7439-89-6	Iron	0.05	56.1	
3010A	02/23/16	6010C	02/24/16	7439-92-1	Lead	0.02	0.02	U
3010A	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	0.05	20.6	
3010A	02/23/16	6010C	02/24/16	7439-98-7	Molybdenum	0.005	0.009	
3010A	02/23/16	6010C	02/24/16	7440-02-0	Nickel	0.01	0.08	
3010A	02/23/16	6010C	02/24/16	7440-22-4	Silver	0.003	0.003	U
3010A	02/23/16	6010C	02/24/16	7440-66-6	Zinc	0.01	0.11	

U-Analyte undetected at given LOQ  
LOQ-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**

Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: AWJ2MB

LIMS ID: 16-2802

Matrix: Water

Data Release Authorized: *[Signature]*

Reported: 02/25/16

QC Report No: AWJ2-AMEC Environment & Infrastructure

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	LOQ	mg/L	Q
3010A	02/23/16	6010C	02/24/16	7429-90-5	Aluminum	0.05	0.05	U
3010A	02/23/16	6010C	02/24/16	7440-38-2	Arsenic	0.05	0.05	U
3010A	02/23/16	6010C	02/24/16	7440-39-3	Barium	0.003	0.003	U
3010A	02/23/16	6010C	02/24/16	7440-43-9	Cadmium	0.002	0.002	U
3010A	02/23/16	6010C	02/24/16	7440-70-2	Calcium	0.05	0.05	U
3010A	02/23/16	6010C	02/24/16	7440-47-3	Chromium	0.005	0.005	U
3010A	02/23/16	6010C	02/24/16	7440-48-4	Cobalt	0.003	0.003	U
3010A	02/23/16	6010C	02/24/16	7440-50-8	Copper	0.002	0.002	U
3010A	02/23/16	6010C	02/24/16	7439-89-6	Iron	0.05	0.05	U
3010A	02/23/16	6010C	02/24/16	7439-92-1	Lead	0.02	0.02	U
3010A	02/23/16	6010C	02/24/16	7439-95-4	Magnesium	0.05	0.05	U
3010A	02/23/16	6010C	02/24/16	7439-98-7	Molybdenum	0.005	0.005	U
3010A	02/23/16	6010C	02/24/16	7440-02-0	Nickel	0.01	0.01	U
3010A	02/23/16	6010C	02/24/16	7440-22-4	Silver	0.003	0.003	U
3010A	02/23/16	6010C	02/24/16	7440-66-6	Zinc	0.01	0.01	U

U-Analyte undetected at given LOQ  
LOQ-Reporting Limit

**INORGANICS ANALYSIS DATA SHEET**

**TOTAL METALS**


Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: AWJ2LCS

LIMS ID: 16-2802

Matrix: Water

Data Release Authorized: 

Reported: 02/25/16

QC Report No: AWJ2-AMEC Environment & Infrastructure

Project: Boeing Apron A

Date Sampled: NA

Date Received: NA

**BLANK SPIKE QUALITY CONTROL REPORT**

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2.01	2.00	100%	
Arsenic	6010C	2.01	2.00	100%	
Barium	6010C	2.01	2.00	100%	
Cadmium	6010C	0.498	0.500	99.6%	
Calcium	6010C	9.75	10.0	97.5%	
Chromium	6010C	0.500	0.500	100%	
Cobalt	6010C	0.487	0.500	97.4%	
Copper	6010C	0.489	0.500	97.8%	
Iron	6010C	2.00	2.00	100%	
Lead	6010C	2.05	2.00	102%	
Magnesium	6010C	10.4	10.0	104%	
Molybdenum	6010C	0.518	0.500	104%	
Nickel	6010C	0.52	0.50	104%	
Silver	6010C	0.533	0.500	107%	
Zinc	6010C	0.50	0.50	100%	

Reported in mg/L

N-Control limit not met

Control Limits: 80-120%





## Analytical Resources, Incorporated

Analytical Chemists and Consultants

April 22, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101

**RE: Project: Boeing Apron A**  
**ARI Job: AZG9**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted nine soil samples and a trip blank in good condition on April 15, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for VOCs and TOCs, as requested on the COC.

The VOCs trip blank surrogate DCE is out of control high.

The VOCS 4/19/16 LCSD is out of control high for trichlorofluoromethane.

The VOCs 4/19/16 CCAL is out of control high for all associated FORM III "Q" flagged analytes. All associated samples that contain analyte have been flagged with a "Q" qualifier.

The VOCs 4/20/16 CCAL is out of control high for all associated FORM III "Q" flagged analytes with the exception of bromomethane and iodomethane which are out of control low. All associated samples that contain analyte have been flagged with a "Q" qualifier.

The VOCs 4/20/16 LCS and/or LCSD are out of control high for several analytes.

The VOCs matrix spike and/or matrix spike duplicate are out of control low and/or high for several analytes.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

Kelly Bottem  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request

Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com



Page: 1 of 1  
 Date: 4/15/14  
 No. of Coolers: 1  
 Cooler Temps: 1.7  
 Ice Present?  
 Cooler Temps:

ARI Assigned Number: A269  
 Turn-around Requested: 7 Day TAT  
 Stopped  
 Phone: 781724-1019  
 Client Company: AMEC Foster Wheeler  
 Client Contact: Crystal Thimsen

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					YAC	2PA	2B	2C	
SB-GW264-00070	4/14/16	9:30	SO	4	X	X	X	X	
SB-GW264-00150	4/14/16	9:35	SO	4	X	X	X	X	
SB-GW263-00080	4/14/16	11:15	SO	4	X	X	X	X	
SB-GW262-00150	4/14/16	11:25	SO	4	X	X	X	X	
SB-GW265-00085	4/14/16	13:20	SO	4	X	X	X	X	
SB-GW265-10085	4/14/16	13:25	SO	4	X	X	X	X	
SB-GW265-00150	4/14/16	13:30	SO	4	X	X	X	X	
SB-GW263-00075	4/15/16	8:55	SO	8	X	X	X	X	
SB-GW263-00150	4/15/16	9:05	SO	4	X	X	X	X	
Trip Blank-041516	4/15/16	-	Water	2	X	X	X	X	
Comments/Special Instructions Send results to Nancy Swenson 4/8/14	Relinquished by: (Signature) Jennifer Bellamy Printed Name: Jennifer Bellamy Company: AMEC Foster Wheeler Date & Time: 4/15/14 14:40 Received by: (Signature) Justina Mays Printed Name: Justina Mays Company: ARI Date & Time: 4/15/16 1440								

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

# Sample ID Cross Reference Report



ARI Job No: AZG9  
Client: AMEC Environment & Infrastructure  
Project Event: 88880100  
Project Name: BoeingApronAAdditionalInvestigation

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. SB-GW264-00070	AZG9A	16-6072	Soil	04/14/16 09:30	04/15/16 14:40
2. SB-GW264-00150	AZG9B	16-6073	Soil	04/14/16 09:35	04/15/16 14:40
3. SB-GW262-00080	AZG9C	16-6074	Soil	04/14/16 11:15	04/15/16 14:40
4. SB-GW262-000150	AZG9D	16-6075	Soil	04/14/16 11:25	04/15/16 14:40
5. SB-GW265-00085	AZG9E	16-6076	Soil	04/14/16 13:20	04/15/16 14:40
6. SB-GW265-100085	AZG9F	16-6077	Soil	04/14/16 13:25	04/15/16 14:40
7. SB-GW265-00150	AZG9G	16-6078	Soil	04/14/16 13:30	04/15/16 14:40
8. SB-GW263-00075	AZG9H	16-6079	Soil	04/15/16 08:55	04/15/16 14:40
9. SB-GW263-00150	AZG9I	16-6080	Soil	04/15/16 09:05	04/15/16 14:40
10. Trip Blank	AZG9J	16-6081	Soil	04/05/16	04/15/16 14:40



# Cooler Receipt Form

ARI Client: AMEC

Project Name: Boeing A Additional investigation

COC No(s): \_\_\_\_\_ NA

Delivered by: Fed-Ex UPS Courier Harid Delivered Other: \_\_\_\_\_

Assigned ARI Job No: AZG9

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES  NO

Were custody papers included with the cooler? ..... YES  NO

Were custody papers properly filled out (ink, signed, etc.) ..... YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)  
Time: 1.7

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005278

Cooler Accepted by: JM Date: 4/15/16 Time: 1440

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES  NO

What kind of packing material was used? ... Bubble Wrap  Wet Ice  Gel Packs  Baggies  Foam Block  Paper  Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? ..... NA  YES  NO

Were all bottles sealed in individual plastic bags? ..... YES  NO

Did all bottles arrive in good condition (unbroken)? ..... YES  NO

Were all bottle labels complete and legible? ..... YES  NO

Did the number of containers listed on COC match with the number of containers received? ..... YES  NO

Did all bottle labels and tags agree with custody papers? ..... YES  NO

Were all bottles used correct for the requested analyses? ..... YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA  YES  NO

Were all VOC vials free of air bubbles? ..... NA  YES  NO

Was sufficient amount of sample sent in each bottle? ..... YES  NO

Date VOC Trip Blank was made at ARI: 4-11-16

Was Sample Split by ARI :  NA  YES  Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: JM Date: 4/15/16 Time: 1630

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

**Additional Notes, Discrepancies, & Resolutions:**  
Sample (SB-GW265-00085) was not received (SB-GW265-00075) was received, but not listed on coe. Logged D0075 as 00085.

By: JM Date: 4/15/16

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)

ORGANICS ANALYSIS DATA SHEET  
 Volatiles by P&T GC/MS-Method SW8260C  
 Page 1 of 2



Sample ID: SB-GW264-00070  
 SAMPLE

Lab Sample ID: AZG9A  
 LIMS ID: 16-6072  
 Matrix: Soil  
 Data Release Authorized: *mw*  
 Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100  
 Date Sampled: 04/14/16  
 Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 04/19/16 19:14

Sample Amount: 3.36 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 30.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.5	< 1.5	U
74-83-9	Bromomethane	1.5	< 1.5	U
75-01-4	Vinyl Chloride	1.5	< 1.5	U
75-00-3	Chloroethane	1.5	< 1.5	U
75-09-2	Methylene Chloride	3.0	4.3	✓
67-64-1	Acetone	7.4	100	
75-15-0	Carbon Disulfide	1.5	3.4	✓
75-35-4	1,1-Dichloroethene	1.5	< 1.5	U
75-34-3	1,1-Dichloroethane	1.5	< 1.5	U
156-60-5	trans-1,2-Dichloroethene	1.5	< 1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	< 1.5	U
67-66-3	Chloroform	1.5	< 1.5	U
107-06-2	1,2-Dichloroethane	1.5	< 1.5	U
78-93-3	2-Butanone	7.4	19	
71-55-6	1,1,1-Trichloroethane	1.5	< 1.5	U
56-23-5	Carbon Tetrachloride	1.5	< 1.5	U
108-05-4	Vinyl Acetate	7.4	< 7.4	U
75-27-4	Bromodichloromethane	1.5	< 1.5	U
78-87-5	1,2-Dichloropropane	1.5	< 1.5	U
10061-01-5	cis-1,3-Dichloropropene	1.5	< 1.5	U
79-01-6	Trichloroethene	1.5	< 1.5	U
124-48-1	Dibromochloromethane	1.5	< 1.5	U
79-00-5	1,1,2-Trichloroethane	1.5	< 1.5	U
71-43-2	Benzene	1.5	< 1.5	U
10061-02-6	trans-1,3-Dichloropropene	1.5	< 1.5	U
110-75-8	2-Chloroethylvinylether	7.4	< 7.4	U
75-25-2	Bromoform	1.5	< 1.5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.4	< 7.4	U
591-78-6	2-Hexanone	7.4	< 7.4	U
127-18-4	Tetrachloroethene	1.5	< 1.5	U
79-34-5	1,1,2,2-Tetrachloroethane	1.5	< 1.5	U
108-88-3	Toluene	1.5	< 1.5	U
108-90-7	Chlorobenzene	1.5	< 1.5	U
100-41-4	Ethylbenzene	1.5	< 1.5	U
100-42-5	Styrene	1.5	< 1.5	U
75-69-4	Trichlorofluoromethane	1.5	< 1.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.0	< 3.0	U
179601-23-1	m,p-Xylene	1.5	< 1.5	U
95-47-6	o-Xylene	1.5	< 1.5	U
95-50-1	1,2-Dichlorobenzene	1.5	< 1.5	U
541-73-1	1,3-Dichlorobenzene	1.5	< 1.5	U
106-46-7	1,4-Dichlorobenzene	1.5	< 1.5	U
107-02-8	Acrolein	7.4	< 7.4	U
74-88-4	Iodomethane	1.5	< 1.5	U
74-96-4	Bromoethane	3.0	< 3.0	U
107-13-1	Acrylonitrile	7.4	< 7.4	U
563-58-6	1,1-Dichloropropene	1.5	< 1.5	U
74-95-3	Dibromomethane	1.5	< 1.5	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	< 1.5	U
96-12-8	1,2-Dibromo-3-chloropropane	7.4	< 7.4	U
96-18-4	1,2,3-Trichloropropane	3.0	< 3.0	U
110-57-6	trans-1,4-Dichloro-2-butene	7.4	< 7.4	U
108-67-8	1,3,5-Trimethylbenzene	1.5	< 1.5	U

*Q*  
*5/12/16*



Lab Sample ID: AZG9A  
 LIMS ID: 16-6072  
 Matrix: Soil  
 Date Analyzed: 04/19/16 19:14

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.5	< 1.5	U
87-68-3	Hexachlorobutadiene	7.4	< 7.4	U
106-93-4	1,2-Dibromoethane	1.5	< 1.5	U
74-97-5	Bromochloromethane	1.5	< 1.5	U
594-20-7	2,2-Dichloropropane	1.5	< 1.5	U
142-28-9	1,3-Dichloropropane	1.5	< 1.5	U
98-82-8	Isopropylbenzene	1.5	< 1.5	U
103-65-1	n-Propylbenzene	1.5	< 1.5	U
108-86-1	Bromobenzene	1.5	< 1.5	U
95-49-8	2-Chlorotoluene	1.5	< 1.5	U
106-43-4	4-Chlorotoluene	1.5	< 1.5	U
98-06-6	tert-Butylbenzene	1.5	< 1.5	U
135-98-8	sec-Butylbenzene	1.5	< 1.5	U
99-87-6	4-Isopropyltoluene	1.5	< 1.5	U
104-51-8	n-Butylbenzene	1.5	< 1.5	U
120-82-1	1,2,4-Trichlorobenzene	7.4	< 7.4	U
91-20-3	Naphthalene	7.4	< 7.4	U
87-61-6	1,2,3-Trichlorobenzene	7.4	< 7.4	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	138%
d8-Toluene	104%
Bromofluorobenzene	99.3%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**  
**Volatiles by P&T GC/MS-Method SW8260C**  
 Page 1 of 2

Sample ID: SB-GW264-00150  
 SAMPLE

Lab Sample ID: AZG9B  
 LIMS ID: 16-6073  
 Matrix: Soil  
 Data Release Authorized: *MW*  
 Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100  
 Date Sampled: 04/14/16  
 Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 04/19/16 19:36

Sample Amount: 1.08 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 68.1%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	4.6	< 4.6	U
74-83-9	Bromomethane	4.6	< 4.6	U
75-01-4	Vinyl Chloride	4.6	37	QM J
75-00-3	Chloroethane	4.6	< 4.6	U
75-09-2	Methylene Chloride	9.3	18	
67-64-1	Acetone	23	570	
75-15-0	Carbon Disulfide	4.6	6.7	Q J
75-35-4	1,1-Dichloroethene	4.6	< 4.6	U
75-34-3	1,1-Dichloroethane	4.6	< 4.6	U
156-60-5	trans-1,2-Dichloroethene	4.6	< 4.6	U
156-59-2	cis-1,2-Dichloroethene	4.6	< 4.6	U
67-66-3	Chloroform	4.6	< 4.6	U
107-06-2	1,2-Dichloroethane	4.6	< 4.6	U
78-93-3	2-Butanone	23	77	
71-55-6	1,1,1-Trichloroethane	4.6	< 4.6	U
56-23-5	Carbon Tetrachloride	4.6	< 4.6	U
108-05-4	Vinyl Acetate	23	< 23	U
75-27-4	Bromodichloromethane	4.6	< 4.6	U
78-87-5	1,2-Dichloropropane	4.6	< 4.6	U
10061-01-5	cis-1,3-Dichloropropene	4.6	< 4.6	U
79-01-6	Trichloroethene	4.6	< 4.6	U
124-48-1	Dibromochloromethane	4.6	< 4.6	U
79-00-5	1,1,2-Trichloroethane	4.6	< 4.6	U
71-43-2	Benzene	4.6	< 4.6	U
10061-02-6	trans-1,3-Dichloropropene	4.6	< 4.6	U
110-75-8	2-Chloroethylvinylether	23	< 23	U
75-25-2	Bromoform	4.6	< 4.6	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	23	< 23	U
591-78-6	2-Hexanone	23	< 23	U
127-18-4	Tetrachloroethene	4.6	< 4.6	U
79-34-5	1,1,2,2-Tetrachloroethane	4.6	< 4.6	U
108-88-3	Toluene	4.6	< 4.6	U
108-90-7	Chlorobenzene	4.6	< 4.6	U
100-41-4	Ethylbenzene	4.6	< 4.6	U
100-42-5	Styrene	4.6	< 4.6	U
75-69-4	Trichlorofluoromethane	4.6	< 4.6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	9.3	< 9.3	U
179601-23-1	m,p-Xylene	4.6	< 4.6	U
95-47-6	o-Xylene	4.6	< 4.6	U
95-50-1	1,2-Dichlorobenzene	4.6	< 4.6	U
541-73-1	1,3-Dichlorobenzene	4.6	< 4.6	U
106-46-7	1,4-Dichlorobenzene	4.6	< 4.6	U
107-02-8	Acrolein	23	< 23	U
74-88-4	Iodomethane	4.6	< 4.6	U
74-96-4	Bromoethane	9.3	< 9.3	U
107-13-1	Acrylonitrile	23	< 23	U
563-58-6	1,1-Dichloropropene	4.6	< 4.6	U
74-95-3	Dibromomethane	4.6	< 4.6	U
630-20-6	1,1,1,2-Tetrachloroethane	4.6	< 4.6	U
96-12-8	1,2-Dibromo-3-chloropropane	23	< 23	U
96-18-4	1,2,3-Trichloropropane	9.3	< 9.3	U
110-57-6	trans-1,4-Dichloro-2-butene	23	< 23	U
108-67-8	1,3,5-Trimethylbenzene	4.6	< 4.6	U

*Cl  
5/12/16*

Lab Sample ID: AZG9B  
LIMS ID: 16-6073  
Matrix: Soil  
Date Analyzed: 04/19/16 19:36

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	4.6	< 4.6	U
87-68-3	Hexachlorobutadiene	23	< 23	U
106-93-4	1,2-Dibromoethane	4.6	< 4.6	U
74-97-5	Bromochloromethane	4.6	< 4.6	U
594-20-7	2,2-Dichloropropane	4.6	< 4.6	U
142-28-9	1,3-Dichloropropane	4.6	< 4.6	U
98-82-8	Isopropylbenzene	4.6	< 4.6	U
103-65-1	n-Propylbenzene	4.6	< 4.6	U
108-86-1	Bromobenzene	4.6	< 4.6	U
95-49-8	2-Chlorotoluene	4.6	< 4.6	U
106-43-4	4-Chlorotoluene	4.6	< 4.6	U
98-06-6	tert-Butylbenzene	4.6	< 4.6	U
135-98-8	sec-Butylbenzene	4.6	< 4.6	U
99-87-6	4-Isopropyltoluene	4.6	< 4.6	U
104-51-8	n-Butylbenzene	4.6	< 4.6	U
120-82-1	1,2,4-Trichlorobenzene	23	< 23	U
91-20-3	Naphthalene	23	< 23	U
87-61-6	1,2,3-Trichlorobenzene	23	< 23	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	135%
d8-Toluene	104%
Bromofluorobenzene	94.9%
d4-1,2-Dichlorobenzene	99.5%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: SB-GW262-00080

SAMPLE

Lab Sample ID: AZG9C

LIMS ID: 16-6074

Matrix: Soil

Data Release Authorized: *MMW*

Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Date Sampled: 04/14/16

Date Received: 04/15/16

Instrument/Analyst: NT5/PAB

Date Analyzed: 04/19/16 19:59

Sample Amount: 3.19 g-dry-wt

Purge Volume: 5.0 mL

Moisture: 35.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.6	< 1.6	U
74-83-9	Bromomethane	1.6	< 1.6	U
75-01-4	Vinyl Chloride	1.6	< 1.6	U
75-00-3	Chloroethane	1.6	< 1.6	U
75-09-2	Methylene Chloride	3.1	< 3.1	U
<b>67-64-1</b>	<b>Acetone</b>	<b>7.8</b>	<b>35</b>	
75-15-0	Carbon Disulfide	1.6	< 1.6	U
75-35-4	1,1-Dichloroethene	1.6	< 1.6	U
75-34-3	1,1-Dichloroethane	1.6	< 1.6	U
156-60-5	trans-1,2-Dichloroethene	1.6	< 1.6	U
156-59-2	cis-1,2-Dichloroethene	1.6	< 1.6	U
67-66-3	Chloroform	1.6	< 1.6	U
107-06-2	1,2-Dichloroethane	1.6	< 1.6	U
78-93-3	2-Butanone	7.8	< 7.8	U
71-55-6	1,1,1-Trichloroethane	1.6	< 1.6	U
56-23-5	Carbon Tetrachloride	1.6	< 1.6	U
108-05-4	Vinyl Acetate	7.8	< 7.8	U
75-27-4	Bromodichloromethane	1.6	< 1.6	U
78-87-5	1,2-Dichloropropane	1.6	< 1.6	U
10061-01-5	cis-1,3-Dichloropropene	1.6	< 1.6	U
79-01-6	Trichloroethene	1.6	< 1.6	U
124-48-1	Dibromochloromethane	1.6	< 1.6	U
79-00-5	1,1,2-Trichloroethane	1.6	< 1.6	U
71-43-2	Benzene	1.6	< 1.6	U
10061-02-6	trans-1,3-Dichloropropene	1.6	< 1.6	U
110-75-8	2-Chloroethylvinylether	7.8	< 7.8	U
75-25-2	Bromoform	1.6	< 1.6	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.8	< 7.8	U
591-78-6	2-Hexanone	7.8	< 7.8	U
127-18-4	Tetrachloroethene	1.6	< 1.6	U
79-34-5	1,1,2,2-Tetrachloroethane	1.6	< 1.6	U
108-88-3	Toluene	1.6	< 1.6	U
108-90-7	Chlorobenzene	1.6	< 1.6	U
100-41-4	Ethylbenzene	1.6	< 1.6	U
100-42-5	Styrene	1.6	< 1.6	U
75-69-4	Trichlorofluoromethane	1.6	< 1.6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3.1	< 3.1	U
179601-23-1	m,p-Xylene	1.6	< 1.6	U
95-47-6	o-Xylene	1.6	< 1.6	U
95-50-1	1,2-Dichlorobenzene	1.6	< 1.6	U
541-73-1	1,3-Dichlorobenzene	1.6	< 1.6	U
106-46-7	1,4-Dichlorobenzene	1.6	< 1.6	U
107-02-8	Acrolein	7.8	< 7.8	U
74-88-4	Iodomethane	1.6	< 1.6	U
74-96-4	Bromoethane	3.1	< 3.1	U
107-13-1	Acrylonitrile	7.8	< 7.8	U
563-58-6	1,1-Dichloropropene	1.6	< 1.6	U
74-95-3	Dibromomethane	1.6	< 1.6	U
630-20-6	1,1,1,2-Tetrachloroethane	1.6	< 1.6	U
96-12-8	1,2-Dibromo-3-chloropropane	7.8	< 7.8	U
96-18-4	1,2,3-Trichloropropane	3.1	< 3.1	U
110-57-6	trans-1,4-Dichloro-2-butene	7.8	< 7.8	U
108-67-8	1,3,5-Trimethylbenzene	1.6	< 1.6	U

Lab Sample ID: AZG9C  
 LIMS ID: 16-6074  
 Matrix: Soil  
 Date Analyzed: 04/19/16 19:59

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.6	< 1.6	U
87-68-3	Hexachlorobutadiene	7.8	< 7.8	U
106-93-4	1,2-Dibromoethane	1.6	< 1.6	U
74-97-5	Bromochloromethane	1.6	< 1.6	U
594-20-7	2,2-Dichloropropane	1.6	< 1.6	U
142-28-9	1,3-Dichloropropane	1.6	< 1.6	U
98-82-8	Isopropylbenzene	1.6	< 1.6	U
103-65-1	n-Propylbenzene	1.6	< 1.6	U
108-86-1	Bromobenzene	1.6	< 1.6	U
95-49-8	2-Chlorotoluene	1.6	< 1.6	U
106-43-4	4-Chlorotoluene	1.6	< 1.6	U
98-06-6	tert-Butylbenzene	1.6	< 1.6	U
135-98-8	sec-Butylbenzene	1.6	< 1.6	U
99-87-6	4-Isopropyltoluene	1.6	< 1.6	U
104-51-8	n-Butylbenzene	1.6	< 1.6	U
120-82-1	1,2,4-Trichlorobenzene	7.8	< 7.8	U
91-20-3	Naphthalene	7.8	< 7.8	U
87-61-6	1,2,3-Trichlorobenzene	7.8	< 7.8	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	139%
d8-Toluene	104%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	102%

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2



Sample ID: SB-GW262-000150

SAMPLE

Lab Sample ID: AZG9D

LIMS ID: 16-6075

Matrix: Soil

Data Release Authorized: *TNW*

Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Date Sampled: 04/14/16

Date Received: 04/15/16

Instrument/Analyst: NT5/PAB

Date Analyzed: 04/19/16 20:21

Sample Amount: 1.75 g-dry-wt

Purge Volume: 5.0 mL

Moisture: 49.6%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	2.9	< 2.9	U
74-83-9	Bromomethane	2.9	< 2.9	U
75-01-4	Vinyl Chloride	2.9	< 2.9	U
75-00-3	Chloroethane	2.9	< 2.9	U
75-09-2	<b>Methylene Chloride</b>	<b>5.7</b>	<b>10</b>	
67-64-1	<b>Acetone</b>	<b>14</b>	<b>330</b>	
75-15-0	<b>Carbon Disulfide</b>	<b>2.9</b>	<b>5.5</b>	<i>QJ</i>
75-35-4	1,1-Dichloroethene	2.9	< 2.9	U
75-34-3	1,1-Dichloroethane	2.9	< 2.9	U
156-60-5	trans-1,2-Dichloroethene	2.9	< 2.9	U
156-59-2	cis-1,2-Dichloroethene	2.9	< 2.9	U
67-66-3	Chloroform	2.9	< 2.9	U
107-06-2	1,2-Dichloroethane	2.9	< 2.9	U
78-93-3	<b>2-Butanone</b>	<b>14</b>	<b>41</b>	
71-55-6	1,1,1-Trichloroethane	2.9	< 2.9	U
56-23-5	Carbon Tetrachloride	2.9	< 2.9	U
108-05-4	Vinyl Acetate	14	< 14	U
75-27-4	Bromodichloromethane	2.9	< 2.9	U
78-87-5	1,2-Dichloropropane	2.9	< 2.9	U
10061-01-5	cis-1,3-Dichloropropene	2.9	< 2.9	U
79-01-6	Trichloroethene	2.9	< 2.9	U
124-48-1	Dibromochloromethane	2.9	< 2.9	U
79-00-5	1,1,2-Trichloroethane	2.9	< 2.9	U
71-43-2	Benzene	2.9	< 2.9	U
10061-02-6	trans-1,3-Dichloropropene	2.9	< 2.9	U
110-75-8	2-Chloroethylvinylether	14	< 14	U
75-25-2	Bromoform	2.9	< 2.9	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	14	< 14	U
591-78-6	2-Hexanone	14	< 14	U
127-18-4	Tetrachloroethene	2.9	< 2.9	U
79-34-5	1,1,2,2-Tetrachloroethane	2.9	< 2.9	U
108-88-3	Toluene	2.9	< 2.9	U
108-90-7	Chlorobenzene	2.9	< 2.9	U
100-41-4	Ethylbenzene	2.9	< 2.9	U
100-42-5	Styrene	2.9	< 2.9	U
75-69-4	Trichlorofluoromethane	2.9	< 2.9	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.7	< 5.7	U
179601-23-1	m,p-Xylene	2.9	< 2.9	U
95-47-6	o-Xylene	2.9	< 2.9	U
95-50-1	1,2-Dichlorobenzene	2.9	< 2.9	U
541-73-1	1,3-Dichlorobenzene	2.9	< 2.9	U
106-46-7	1,4-Dichlorobenzene	2.9	< 2.9	U
107-02-8	Acrolein	14	< 14	U
74-88-4	Iodomethane	2.9	< 2.9	U
74-96-4	Bromoethane	5.7	< 5.7	U
107-13-1	Acrylonitrile	14	< 14	U
563-58-6	1,1-Dichloropropene	2.9	< 2.9	U
74-95-3	Dibromomethane	2.9	< 2.9	U
630-20-6	1,1,1,2-Tetrachloroethane	2.9	< 2.9	U
96-12-8	1,2-Dibromo-3-chloropropane	14	< 14	U
96-18-4	1,2,3-Trichloropropane	5.7	< 5.7	U
110-57-6	trans-1,4-Dichloro-2-butene	14	< 14	U
108-67-8	1,3,5-Trimethylbenzene	2.9	< 2.9	U

*CI 5/12/14*



Lab Sample ID: AZG9D  
 LIMS ID: 16-6075  
 Matrix: Soil  
 Date Analyzed: 04/19/16 20:21

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	2.9	< 2.9	U
87-68-3	Hexachlorobutadiene	14	< 14	U
106-93-4	1,2-Dibromoethane	2.9	< 2.9	U
74-97-5	Bromochloromethane	2.9	< 2.9	U
594-20-7	2,2-Dichloropropane	2.9	< 2.9	U
142-28-9	1,3-Dichloropropane	2.9	< 2.9	U
98-82-8	Isopropylbenzene	2.9	< 2.9	U
103-65-1	n-Propylbenzene	2.9	< 2.9	U
108-86-1	Bromobenzene	2.9	< 2.9	U
95-49-8	2-Chlorotoluene	2.9	< 2.9	U
106-43-4	4-Chlorotoluene	2.9	< 2.9	U
98-06-6	tert-Butylbenzene	2.9	< 2.9	U
135-98-8	sec-Butylbenzene	2.9	< 2.9	U
99-87-6	4-Isopropyltoluene	2.9	< 2.9	U
104-51-8	n-Butylbenzene	2.9	< 2.9	U
120-82-1	1,2,4-Trichlorobenzene	14	< 14	U
91-20-3	Naphthalene	14	< 14	U
87-61-6	1,2,3-Trichlorobenzene	14	< 14	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	136%
d8-Toluene	103%
Bromofluorobenzene	99.1%
d4-1,2-Dichlorobenzene	98.7%

ORGANICS ANALYSIS DATA SHEET  
 Volatiles by P&T GC/MS-Method SW8260C  
 Page 1 of 2



Sample ID: SB-GW265-00085  
 SAMPLE

Lab Sample ID: AZG9E  
 LIMS ID: 16-6076  
 Matrix: Soil  
 Data Release Authorized: *mm*  
 Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100  
 Date Sampled: 04/14/16  
 Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 04/19/16 20:44

Sample Amount: 1.85 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 54.6%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	2.7	< 2.7	U
74-83-9	Bromomethane	2.7	< 2.7	U
75-01-4	Vinyl Chloride	2.7	< 2.7	U
75-00-3	Chloroethane	2.7	< 2.7	U
75-09-2	Methylene Chloride	5.4	< 5.4	U
<b>67-64-1</b>	<b>Acetone</b>	<b>14</b>	<b>190</b>	
75-15-0	Carbon Disulfide	2.7	< 2.7	U
75-35-4	1,1-Dichloroethene	2.7	< 2.7	U
75-34-3	1,1-Dichloroethane	2.7	< 2.7	U
156-60-5	trans-1,2-Dichloroethene	2.7	< 2.7	U
156-59-2	cis-1,2-Dichloroethene	2.7	< 2.7	U
67-66-3	Chloroform	2.7	< 2.7	U
107-06-2	1,2-Dichloroethane	2.7	< 2.7	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>14</b>	<b>28</b>	
71-55-6	1,1,1-Trichloroethane	2.7	< 2.7	U
56-23-5	Carbon Tetrachloride	2.7	< 2.7	U
108-05-4	Vinyl Acetate	14	< 14	U
75-27-4	Bromodichloromethane	2.7	< 2.7	U
78-87-5	1,2-Dichloropropane	2.7	< 2.7	U
10061-01-5	cis-1,3-Dichloropropene	2.7	< 2.7	U
79-01-6	Trichloroethene	2.7	< 2.7	U
124-48-1	Dibromochloromethane	2.7	< 2.7	U
79-00-5	1,1,2-Trichloroethane	2.7	< 2.7	U
71-43-2	Benzene	2.7	< 2.7	U
10061-02-6	trans-1,3-Dichloropropene	2.7	< 2.7	U
110-75-8	2-Chloroethylvinylether	14	< 14	U
75-25-2	Bromoform	2.7	< 2.7	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	14	< 14	U
591-78-6	2-Hexanone	14	< 14	U
127-18-4	Tetrachloroethene	2.7	< 2.7	U
79-34-5	1,1,2,2-Tetrachloroethane	2.7	< 2.7	U
108-88-3	Toluene	2.7	< 2.7	U
108-90-7	Chlorobenzene	2.7	< 2.7	U
100-41-4	Ethylbenzene	2.7	< 2.7	U
100-42-5	Styrene	2.7	< 2.7	U
75-69-4	Trichlorofluoromethane	2.7	< 2.7	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.4	< 5.4	U
179601-23-1	m,p-Xylene	2.7	< 2.7	U
95-47-6	o-Xylene	2.7	< 2.7	U
95-50-1	1,2-Dichlorobenzene	2.7	< 2.7	U
541-73-1	1,3-Dichlorobenzene	2.7	< 2.7	U
106-46-7	1,4-Dichlorobenzene	2.7	< 2.7	U
107-02-8	Acrolein	14	< 14	U
74-88-4	Iodomethane	2.7	< 2.7	U
74-96-4	Bromoethane	5.4	< 5.4	U
107-13-1	Acrylonitrile	14	< 14	U
563-58-6	1,1-Dichloropropene	2.7	< 2.7	U
74-95-3	Dibromomethane	2.7	< 2.7	U
630-20-6	1,1,1,2-Tetrachloroethane	2.7	< 2.7	U
96-12-8	1,2-Dibromo-3-chloropropane	14	< 14	U
96-18-4	1,2,3-Trichloropropane	5.4	< 5.4	U
110-57-6	trans-1,4-Dichloro-2-butene	14	< 14	U
108-67-8	1,3,5-Trimethylbenzene	2.7	< 2.7	U



Lab Sample ID: AZG9E  
 LIMS ID: 16-6076  
 Matrix: Soil  
 Date Analyzed: 04/19/16 20:44

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	2.7	< 2.7	U
87-68-3	Hexachlorobutadiene	14	< 14	U
106-93-4	1,2-Dibromoethane	2.7	< 2.7	U
74-97-5	Bromochloromethane	2.7	< 2.7	U
594-20-7	2,2-Dichloropropane	2.7	< 2.7	U
142-28-9	1,3-Dichloropropane	2.7	< 2.7	U
98-82-8	Isopropylbenzene	2.7	< 2.7	U
103-65-1	n-Propylbenzene	2.7	< 2.7	U
108-86-1	Bromobenzene	2.7	< 2.7	U
95-49-8	2-Chlorotoluene	2.7	< 2.7	U
106-43-4	4-Chlorotoluene	2.7	< 2.7	U
98-06-6	tert-Butylbenzene	2.7	< 2.7	U
135-98-8	sec-Butylbenzene	2.7	< 2.7	U
99-87-6	4-Isopropyltoluene	2.7	< 2.7	U
104-51-8	n-Butylbenzene	2.7	< 2.7	U
120-82-1	1,2,4-Trichlorobenzene	14	< 14	U
91-20-3	Naphthalene	14	< 14	U
87-61-6	1,2,3-Trichlorobenzene	14	< 14	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	138%
d8-Toluene	105%
Bromofluorobenzene	99.8%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**  
**Volatiles by P&T GC/MS-Method SW8260C**  
 Page 1 of 2

Sample ID: SB-GW265-100085  
 SAMPLE

Lab Sample ID: AZG9F  
 LIMS ID: 16-6077  
 Matrix: Soil  
 Data Release Authorized: *mm*  
 Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100  
 Date Sampled: 04/14/16  
 Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
 Date Analyzed: 04/20/16 13:25

Sample Amount: 1.93 g-dry-wt  
 Purge Volume: 5.0 mL  
 Moisture: 48.5%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	2.6	< 2.6	U
74-83-9	Bromomethane	2.6	< 2.6	U
75-01-4	Vinyl Chloride	2.6	< 2.6	U
75-00-3	Chloroethane	2.6	< 2.6	U
75-09-2	Methylene Chloride	5.2	< 5.2	U
<b>67-64-1</b>	<b>Acetone</b>	<b>13</b>	<b>120</b>	
75-15-0	Carbon Disulfide	2.6	< 2.6	U
75-35-4	1,1-Dichloroethene	2.6	< 2.6	U
75-34-3	1,1-Dichloroethane	2.6	< 2.6	U
156-60-5	trans-1,2-Dichloroethene	2.6	< 2.6	U
156-59-2	cis-1,2-Dichloroethene	2.6	< 2.6	U
67-66-3	Chloroform	2.6	< 2.6	U
107-06-2	1,2-Dichloroethane	2.6	< 2.6	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>13</b>	<b>20</b>	
71-55-6	1,1,1-Trichloroethane	2.6	< 2.6	U
56-23-5	Carbon Tetrachloride	2.6	< 2.6	U
108-05-4	Vinyl Acetate	13	< 13	U
75-27-4	Bromodichloromethane	2.6	< 2.6	U
78-87-5	1,2-Dichloropropane	2.6	< 2.6	U
10061-01-5	cis-1,3-Dichloropropene	2.6	< 2.6	U
79-01-6	Trichloroethene	2.6	< 2.6	U
124-48-1	Dibromochloromethane	2.6	< 2.6	U
79-00-5	1,1,2-Trichloroethane	2.6	< 2.6	U
71-43-2	Benzene	2.6	< 2.6	U
10061-02-6	trans-1,3-Dichloropropene	2.6	< 2.6	U
110-75-8	2-Chloroethylvinylether	13	< 13	U
75-25-2	Bromoform	2.6	< 2.6	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	13	< 13	U
591-78-6	2-Hexanone	13	< 13	U
127-18-4	Tetrachloroethene	2.6	< 2.6	U
79-34-5	1,1,2,2-Tetrachloroethane	2.6	< 2.6	U
108-88-3	Toluene	2.6	< 2.6	U
108-90-7	Chlorobenzene	2.6	< 2.6	U
100-41-4	Ethylbenzene	2.6	< 2.6	U
100-42-5	Styrene	2.6	< 2.6	U
75-69-4	Trichlorofluoromethane	2.6	< 2.6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.2	< 5.2	U
179601-23-1	m, p-Xylene	2.6	< 2.6	U
95-47-6	o-Xylene	2.6	< 2.6	U
95-50-1	1,2-Dichlorobenzene	2.6	< 2.6	U
541-73-1	1,3-Dichlorobenzene	2.6	< 2.6	U
106-46-7	1,4-Dichlorobenzene	2.6	< 2.6	U
107-02-8	Acrolein	13	< 13	U
74-88-4	Iodomethane	2.6	< 2.6	U
74-96-4	Bromoethane	5.2	< 5.2	U
107-13-1	Acrylonitrile	13	< 13	U
563-58-6	1,1-Dichloropropene	2.6	< 2.6	U
74-95-3	Dibromomethane	2.6	< 2.6	U
630-20-6	1,1,1,2-Tetrachloroethane	2.6	< 2.6	U
96-12-8	1,2-Dibromo-3-chloropropane	13	< 13	U
96-18-4	1,2,3-Trichloropropane	5.2	< 5.2	U
110-57-6	trans-1,4-Dichloro-2-butene	13	< 13	U
108-67-8	1,3,5-Trimethylbenzene	2.6	< 2.6	U

*6/5/2016*

Sample ID: SB-GW265-100085  
 SAMPLE

Lab Sample ID: AZG9F  
 LIMS ID: 16-6077  
 Matrix: Soil  
 Date Analyzed: 04/20/16 13:25

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	2.6	< 2.6	U
87-68-3	Hexachlorobutadiene	13	< 13	U
106-93-4	1,2-Dibromoethane	2.6	< 2.6	U
74-97-5	Bromochloromethane	2.6	< 2.6	U
594-20-7	2,2-Dichloropropane	2.6	< 2.6	U
142-28-9	1,3-Dichloropropane	2.6	< 2.6	U
98-82-8	Isopropylbenzene	2.6	< 2.6	U
103-65-1	n-Propylbenzene	2.6	< 2.6	U
108-86-1	Bromobenzene	2.6	< 2.6	U
95-49-8	2-Chlorotoluene	2.6	< 2.6	U
106-43-4	4-Chlorotoluene	2.6	< 2.6	U
98-06-6	tert-Butylbenzene	2.6	< 2.6	U
135-98-8	sec-Butylbenzene	2.6	< 2.6	U
99-87-6	4-Isopropyltoluene	2.6	< 2.6	U
104-51-8	n-Butylbenzene	2.6	< 2.6	U
120-82-1	1,2,4-Trichlorobenzene	13	< 13	U
91-20-3	Naphthalene	13	< 13	U
87-61-6	1,2,3-Trichlorobenzene	13	< 13	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	131%	Q
d8-Toluene	103%	
Bromofluorobenzene	95.7%	
d4-1,2-Dichlorobenzene	98.7%	

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: SB-GW265-00150

SAMPLE

Lab Sample ID: AZG9G

LIMS ID: 16-6078

Matrix: Soil

Data Release Authorized: *MW*

Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Date Sampled: 04/14/16

Date Received: 04/15/16

Instrument/Analyst: NT5/PAB

Date Analyzed: 04/20/16 13:47

Sample Amount: 4.27 g-dry-wt

Purge Volume: 5.0 mL

Moisture: 17.0%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.2	< 1.2	U
74-83-9	Bromomethane	1.2	< 1.2	U <i>J</i>
75-01-4	Vinyl Chloride	1.2	< 1.2	U
75-00-3	Chloroethane	1.2	< 1.2	U
75-09-2	Methylene Chloride	2.3	< 2.3	U
67-64-1	Acetone	5.9	21	
75-15-0	Carbon Disulfide	1.2	1.8	<i>JP</i>
75-35-4	1,1-Dichloroethene	1.2	< 1.2	U
75-34-3	1,1-Dichloroethane	1.2	< 1.2	U
156-60-5	trans-1,2-Dichloroethene	1.2	< 1.2	U
156-59-2	cis-1,2-Dichloroethene	1.2	< 1.2	U
67-66-3	Chloroform	1.2	< 1.2	U
107-06-2	1,2-Dichloroethane	1.2	< 1.2	U
78-93-3	2-Butanone	5.9	< 5.9	U
71-55-6	1,1,1-Trichloroethane	1.2	< 1.2	U
56-23-5	Carbon Tetrachloride	1.2	< 1.2	U
108-05-4	Vinyl Acetate	5.9	< 5.9	U
75-27-4	Bromodichloromethane	1.2	< 1.2	U
78-87-5	1,2-Dichloropropane	1.2	< 1.2	U
10061-01-5	cis-1,3-Dichloropropene	1.2	< 1.2	U
79-01-6	Trichloroethene	1.2	< 1.2	U
124-48-1	Dibromochloromethane	1.2	< 1.2	U
79-00-5	1,1,2-Trichloroethane	1.2	< 1.2	U
71-43-2	Benzene	1.2	< 1.2	U
10061-02-6	trans-1,3-Dichloropropene	1.2	< 1.2	U
110-75-8	2-Chloroethylvinylether	5.9	< 5.9	U
75-25-2	Bromoform	1.2	< 1.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.9	< 5.9	U
591-78-6	2-Hexanone	5.9	< 5.9	U
127-18-4	Tetrachloroethene	1.2	< 1.2	U
79-34-5	1,1,2,2-Tetrachloroethane	1.2	< 1.2	U
108-88-3	Toluene	1.2	< 1.2	U
108-90-7	Chlorobenzene	1.2	< 1.2	U
100-41-4	Ethylbenzene	1.2	< 1.2	U
100-42-5	Styrene	1.2	< 1.2	U
75-69-4	Trichlorofluoromethane	1.2	< 1.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.3	< 2.3	U
179601-23-1	m,p-Xylene	1.2	< 1.2	U
95-47-6	o-Xylene	1.2	< 1.2	U
95-50-1	1,2-Dichlorobenzene	1.2	< 1.2	U
541-73-1	1,3-Dichlorobenzene	1.2	< 1.2	U
106-46-7	1,4-Dichlorobenzene	1.2	< 1.2	U
107-02-8	Acrolein	5.9	< 5.9	U
74-88-4	Iodomethane	1.2	< 1.2	U <i>J</i>
74-96-4	Bromoethane	2.3	< 2.3	U
107-13-1	Acrylonitrile	5.9	< 5.9	U
563-58-6	1,1-Dichloropropene	1.2	< 1.2	U
74-95-3	Dibromomethane	1.2	< 1.2	U
630-20-6	1,1,1,2-Tetrachloroethane	1.2	< 1.2	U
96-12-8	1,2-Dibromo-3-chloropropane	5.9	< 5.9	U
96-18-4	1,2,3-Trichloropropane	2.3	< 2.3	U
110-57-6	trans-1,4-Dichloro-2-butene	5.9	< 5.9	U
108-67-8	1,3,5-Trimethylbenzene	1.2	< 1.2	U

*GI 5/2/16*

Lab Sample ID: AZG9G  
 LIMS ID: 16-6078  
 Matrix: Soil  
 Date Analyzed: 04/20/16 13:47

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.2	< 1.2	U
87-68-3	Hexachlorobutadiene	5.9	< 5.9	U
106-93-4	1,2-Dibromoethane	1.2	< 1.2	U
74-97-5	Bromochloromethane	1.2	< 1.2	U
594-20-7	2,2-Dichloropropane	1.2	< 1.2	U
142-28-9	1,3-Dichloropropane	1.2	< 1.2	U
98-82-8	Isopropylbenzene	1.2	< 1.2	U
103-65-1	n-Propylbenzene	1.2	< 1.2	U
108-86-1	Bromobenzene	1.2	< 1.2	U
95-49-8	2-Chlorotoluene	1.2	< 1.2	U
106-43-4	4-Chlorotoluene	1.2	< 1.2	U
98-06-6	tert-Butylbenzene	1.2	< 1.2	U
135-98-8	sec-Butylbenzene	1.2	< 1.2	U
99-87-6	4-Isopropyltoluene	1.2	< 1.2	U
104-51-8	n-Butylbenzene	1.2	< 1.2	U
120-82-1	1,2,4-Trichlorobenzene	5.9	< 5.9	U
91-20-3	Naphthalene	5.9	< 5.9	U
87-61-6	1,2,3-Trichlorobenzene	5.9	< 5.9	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	146% Q
d8-Toluene	105%
Bromofluorobenzene	103%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: SB-GW263-00075  
SAMPLE

Lab Sample ID: AZG9H  
LIMS ID: 16-6079  
Matrix: Soil  
Data Release Authorized: *MW*  
Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100  
Date Sampled: 04/15/16  
Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 04/20/16 14:10

Sample Amount: 3.40 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 24.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.5	< 1.5	U
74-83-9	Bromomethane	1.5	< 1.5	U
75-01-4	Vinyl Chloride	1.5	< 1.5	U
75-00-3	Chloroethane	1.5	< 1.5	U
75-09-2	Methylene Chloride	2.9	< 2.9	U
<b>67-64-1</b>	<b>Acetone</b>	<b>7.4</b>	<b>44</b>	
75-15-0	Carbon Disulfide	1.5	< 1.5	U
75-35-4	1,1-Dichloroethane	1.5	< 1.5	U
75-34-3	1,1-Dichloroethane	1.5	< 1.5	U
156-60-5	trans-1,2-Dichloroethene	1.5	< 1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	< 1.5	U
67-66-3	Chloroform	1.5	< 1.5	U
107-06-2	1,2-Dichloroethane	1.5	< 1.5	U
78-93-3	2-Butanone	7.4	< 7.4	U
71-55-6	1,1,1-Trichloroethane	1.5	< 1.5	U
56-23-5	Carbon Tetrachloride	1.5	< 1.5	U
108-05-4	Vinyl Acetate	7.4	< 7.4	U
75-27-4	Bromodichloromethane	1.5	< 1.5	U
78-87-5	1,2-Dichloropropane	1.5	< 1.5	U
10061-01-5	cis-1,3-Dichloropropene	1.5	< 1.5	U
79-01-6	Trichloroethene	1.5	< 1.5	U
124-48-1	Dibromochloromethane	1.5	< 1.5	U
79-00-5	1,1,2-Trichloroethane	1.5	< 1.5	U
71-43-2	Benzene	1.5	< 1.5	U
10061-02-6	trans-1,3-Dichloropropene	1.5	< 1.5	U
110-75-8	2-Chloroethylvinylether	7.4	< 7.4	U
75-25-2	Bromoform	1.5	< 1.5	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.4	< 7.4	U
591-78-6	2-Hexanone	7.4	< 7.4	U
127-18-4	Tetrachloroethene	1.5	< 1.5	U
79-34-5	1,1,2,2-Tetrachloroethane	1.5	< 1.5	U
108-88-3	Toluene	1.5	< 1.5	U
108-90-7	Chlorobenzene	1.5	< 1.5	U
100-41-4	Ethylbenzene	1.5	< 1.5	U
100-42-5	Styrene	1.5	< 1.5	U
75-69-4	Trichlorofluoromethane	1.5	< 1.5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.9	< 2.9	U
179601-23-1	m,p-Xylene	1.5	< 1.5	U
95-47-6	o-Xylene	1.5	< 1.5	U
95-50-1	1,2-Dichlorobenzene	1.5	< 1.5	U
541-73-1	1,3-Dichlorobenzene	1.5	< 1.5	U
106-46-7	1,4-Dichlorobenzene	1.5	< 1.5	U
107-02-8	Acrolein	7.4	< 7.4	U
74-88-4	Iodomethane	1.5	< 1.5	U
74-96-4	Bromoethane	2.9	< 2.9	U
107-13-1	Acrylonitrile	7.4	< 7.4	U
563-58-6	1,1-Dichloropropene	1.5	< 1.5	U
74-95-3	Dibromomethane	1.5	< 1.5	U
630-20-6	1,1,1,2-Tetrachloroethane	1.5	< 1.5	U
96-12-8	1,2-Dibromo-3-chloropropane	7.4	< 7.4	U
96-18-4	1,2,3-Trichloropropane	2.9	< 2.9	U
110-57-6	trans-1,4-Dichloro-2-butene	7.4	< 7.4	U
108-67-8	1,3,5-Trimethylbenzene	1.5	< 1.5	U

*cf  
5/12/16*

Sample ID: SB-GW263-00075  
 SAMPLE

Lab Sample ID: AZG9H  
 LIMS ID: 16-6079  
 Matrix: Soil  
 Date Analyzed: 04/20/16 14:10

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.5	< 1.5	U
87-68-3	Hexachlorobutadiene	7.4	< 7.4	U
106-93-4	1,2-Dibromoethane	1.5	< 1.5	U
74-97-5	Bromochloromethane	1.5	< 1.5	U
594-20-7	2,2-Dichloropropane	1.5	< 1.5	U
142-28-9	1,3-Dichloropropane	1.5	< 1.5	U
98-82-8	Isopropylbenzene	1.5	< 1.5	U
103-65-1	n-Propylbenzene	1.5	< 1.5	U
108-86-1	Bromobenzene	1.5	< 1.5	U
95-49-8	2-Chlorotoluene	1.5	< 1.5	U
106-43-4	4-Chlorotoluene	1.5	< 1.5	U
98-06-6	tert-Butylbenzene	1.5	< 1.5	U
135-98-8	sec-Butylbenzene	1.5	< 1.5	U
99-87-6	4-Isopropyltoluene	1.5	< 1.5	U
104-51-8	n-Butylbenzene	1.5	< 1.5	U
120-82-1	1,2,4-Trichlorobenzene	7.4	< 7.4	U
91-20-3	Naphthalene	7.4	< 7.4	U
87-61-6	1,2,3-Trichlorobenzene	7.4	< 7.4	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	127%	Q
d8-Toluene	105%	
Bromofluorobenzene	95.7%	
d4-1,2-Dichlorobenzene	102%	

cf  
5/12/16

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2



Sample ID: SB-GW263-00075

MATRIX SPIKE

Lab Sample ID: AZG9H

LIMS ID: 16-6079

Matrix: Soil

Data Release Authorized: *MW*

Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Date Sampled: 04/15/16

Date Received: 04/15/16

Instrument/Analyst: NT5/PAB

Date Analyzed: 04/20/16 15:16

Sample Amount: 3.81 g-dry-wt

Purge Volume: 5.0 mL

Moisture: 24.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.3	---	
74-83-9	Bromomethane	1.3	---	
75-01-4	Vinyl Chloride	1.3	---	
75-00-3	Chloroethane	1.3	---	
75-09-2	Methylene Chloride	2.6	---	
67-64-1	Acetone	6.6	---	
75-15-0	Carbon Disulfide	1.3	---	
75-35-4	1,1-Dichloroethene	1.3	---	
75-34-3	1,1-Dichloroethane	1.3	---	
156-60-5	trans-1,2-Dichloroethene	1.3	---	
156-59-2	cis-1,2-Dichloroethene	1.3	---	
67-66-3	Chloroform	1.3	---	
107-06-2	1,2-Dichloroethane	1.3	---	
78-93-3	2-Butanone	6.6	---	
71-55-6	1,1,1-Trichloroethane	1.3	---	
56-23-5	Carbon Tetrachloride	1.3	---	
108-05-4	Vinyl Acetate	6.6	---	
75-27-4	Bromodichloromethane	1.3	---	
78-87-5	1,2-Dichloropropane	1.3	---	
10061-01-5	cis-1,3-Dichloropropene	1.3	---	
79-01-6	Trichloroethene	1.3	---	
124-48-1	Dibromochloromethane	1.3	---	
79-00-5	1,1,2-Trichloroethane	1.3	---	
71-43-2	Benzene	1.3	---	
10061-02-6	trans-1,3-Dichloropropene	1.3	---	
110-75-8	2-Chloroethylvinylether	6.6	---	
75-25-2	Bromoform	1.3	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	6.6	---	
591-78-6	2-Hexanone	6.6	---	
127-18-4	Tetrachloroethene	1.3	---	
79-34-5	1,1,2,2-Tetrachloroethane	1.3	---	
108-88-3	Toluene	1.3	---	
108-90-7	Chlorobenzene	1.3	---	
100-41-4	Ethylbenzene	1.3	---	
100-42-5	Styrene	1.3	---	
75-69-4	Trichlorofluoromethane	1.3	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.6	---	
179601-23-1	m,p-Xylene	1.3	---	
95-47-6	o-Xylene	1.3	---	
95-50-1	1,2-Dichlorobenzene	1.3	---	
541-73-1	1,3-Dichlorobenzene	1.3	---	
106-46-7	1,4-Dichlorobenzene	1.3	---	
107-02-8	Acrolein	6.6	---	
74-88-4	Iodomethane	1.3	---	
74-96-4	Bromoethane	2.6	---	
107-13-1	Acrylonitrile	6.6	---	
563-58-6	1,1-Dichloropropene	1.3	---	
74-95-3	Dibromomethane	1.3	---	
630-20-6	1,1,1,2-Tetrachloroethane	1.3	---	
96-12-8	1,2-Dibromo-3-chloropropane	6.6	---	
96-18-4	1,2,3-Trichloropropane	2.6	---	
110-57-6	trans-1,4-Dichloro-2-butene	6.6	---	
108-67-8	1,3,5-Trimethylbenzene	1.3	---	

Sample ID: SB-GW263-00075  
 MATRIX SPIKE

Lab Sample ID: AZG9H  
 LIMS ID: 16-6079  
 Matrix: Soil  
 Date Analyzed: 04/20/16 15:16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.3	---	
87-68-3	Hexachlorobutadiene	6.6	---	
106-93-4	1,2-Dibromoethane	1.3	---	
74-97-5	Bromochloromethane	1.3	---	
594-20-7	2,2-Dichloropropane	1.3	---	
142-28-9	1,3-Dichloropropane	1.3	---	
98-82-8	Isopropylbenzene	1.3	---	
103-65-1	n-Propylbenzene	1.3	---	
108-86-1	Bromobenzene	1.3	---	
95-49-8	2-Chlorotoluene	1.3	---	
106-43-4	4-Chlorotoluene	1.3	---	
98-06-6	tert-Butylbenzene	1.3	---	
135-98-8	sec-Butylbenzene	1.3	---	
99-87-6	4-Isopropyltoluene	1.3	---	
104-51-8	n-Butylbenzene	1.3	---	
120-82-1	1,2,4-Trichlorobenzene	6.6	---	
91-20-3	Naphthalene	6.6	---	
87-61-6	1,2,3-Trichlorobenzene	6.6	---	

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	136% Q
d8-Toluene	103%
Bromofluorobenzene	98.0%
d4-1,2-Dichlorobenzene	101%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: SB-GW263-00075  
MATRIX SPIKE DUP

Lab Sample ID: AZG9H  
LIMS ID: 16-6079  
Matrix: Soil  
Data Release Authorized: *MW*  
Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100  
Date Sampled: 04/15/16  
Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 04/20/16 15:39

Sample Amount: 3.59 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 24.2%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.4	---	
74-83-9	Bromomethane	1.4	---	
75-01-4	Vinyl Chloride	1.4	---	
75-00-3	Chloroethane	1.4	---	
75-09-2	Methylene Chloride	2.8	---	
67-64-1	Acetone	7.0	---	
75-15-0	Carbon Disulfide	1.4	---	
75-35-4	1,1-Dichloroethene	1.4	---	
75-34-3	1,1-Dichloroethane	1.4	---	
156-60-5	trans-1,2-Dichloroethene	1.4	---	
156-59-2	cis-1,2-Dichloroethene	1.4	---	
67-66-3	Chloroform	1.4	---	
107-06-2	1,2-Dichloroethane	1.4	---	
78-93-3	2-Butanone	7.0	---	
71-55-6	1,1,1-Trichloroethane	1.4	---	
56-23-5	Carbon Tetrachloride	1.4	---	
108-05-4	Vinyl Acetate	7.0	---	
75-27-4	Bromodichloromethane	1.4	---	
78-87-5	1,2-Dichloropropane	1.4	---	
10061-01-5	cis-1,3-Dichloropropene	1.4	---	
79-01-6	Trichloroethene	1.4	---	
124-48-1	Dibromochloromethane	1.4	---	
79-00-5	1,1,2-Trichloroethane	1.4	---	
71-43-2	Benzene	1.4	---	
10061-02-6	trans-1,3-Dichloropropene	1.4	---	
110-75-8	2-Chloroethylvinylether	7.0	---	
75-25-2	Bromoform	1.4	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	7.0	---	
591-78-6	2-Hexanone	7.0	---	
127-18-4	Tetrachloroethene	1.4	---	
79-34-5	1,1,2,2-Tetrachloroethane	1.4	---	
108-88-3	Toluene	1.4	---	
108-90-7	Chlorobenzene	1.4	---	
100-41-4	Ethylbenzene	1.4	---	
100-42-5	Styrene	1.4	---	
75-69-4	Trichlorofluoromethane	1.4	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.8	---	
179601-23-1	m,p-Xylene	1.4	---	
95-47-6	o-Xylene	1.4	---	
95-50-1	1,2-Dichlorobenzene	1.4	---	
541-73-1	1,3-Dichlorobenzene	1.4	---	
106-46-7	1,4-Dichlorobenzene	1.4	---	
107-02-8	Acrolein	7.0	---	
74-88-4	Iodomethane	1.4	---	
74-96-4	Bromoethane	2.8	---	
107-13-1	Acrylonitrile	7.0	---	
563-58-6	1,1-Dichloropropene	1.4	---	
74-95-3	Dibromomethane	1.4	---	
630-20-6	1,1,1,2-Tetrachloroethane	1.4	---	
96-12-8	1,2-Dibromo-3-chloropropane	7.0	---	
96-18-4	1,2,3-Trichloropropane	2.8	---	
110-57-6	trans-1,4-Dichloro-2-butene	7.0	---	
108-67-8	1,3,5-Trimethylbenzene	1.4	---	

Sample ID: SB-GW263-00075  
 MATRIX SPIKE DUP

Lab Sample ID: AZG9H  
 LIMS ID: 16-6079  
 Matrix: Soil  
 Date Analyzed: 04/20/16 15:39

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.4	---	
87-68-3	Hexachlorobutadiene	7.0	---	
106-93-4	1,2-Dibromoethane	1.4	---	
74-97-5	Bromochloromethane	1.4	---	
594-20-7	2,2-Dichloropropane	1.4	---	
142-28-9	1,3-Dichloropropane	1.4	---	
98-82-8	Isopropylbenzene	1.4	---	
103-65-1	n-Propylbenzene	1.4	---	
108-86-1	Bromobenzene	1.4	---	
95-49-8	2-Chlorotoluene	1.4	---	
106-43-4	4-Chlorotoluene	1.4	---	
98-06-6	tert-Butylbenzene	1.4	---	
135-98-8	sec-Butylbenzene	1.4	---	
99-87-6	4-Isopropyltoluene	1.4	---	
104-51-8	n-Butylbenzene	1.4	---	
120-82-1	1,2,4-Trichlorobenzene	7.0	---	
91-20-3	Naphthalene	7.0	---	
87-61-6	1,2,3-Trichlorobenzene	7.0	---	

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	142% Q
d8-Toluene	104%
Bromofluorobenzene	102%
d4-1,2-Dichlorobenzene	103%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: SB-GW263-00150  
SAMPLE

Lab Sample ID: AZG9I  
LIMS ID: 16-6080  
Matrix: Soil  
Data Release Authorized: *MMW*  
Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100  
Date Sampled: 04/15/16  
Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 04/20/16 14:32

Sample Amount: 1.61 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: 57.8%

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	3.1	< 3.1	U
74-83-9	Bromomethane	3.1	< 3.1	UJ
75-01-4	<b>Vinyl Chloride</b>	<b>3.1</b>	<b>6.5</b>	
75-00-3	Chloroethane	3.1	< 3.1	U
75-09-2	Methylene Chloride	6.2	< 6.2	U
67-64-1	<b>Acetone</b>	<b>16</b>	<b>250</b>	
75-15-0	Carbon Disulfide	3.1	< 3.1	U
75-35-4	1,1-Dichloroethene	3.1	< 3.1	U
75-34-3	1,1-Dichloroethane	3.1	< 3.1	U
156-60-5	trans-1,2-Dichloroethene	3.1	< 3.1	U
156-59-2	cis-1,2-Dichloroethene	3.1	< 3.1	U
67-66-3	Chloroform	3.1	< 3.1	U
107-06-2	1,2-Dichloroethane	3.1	< 3.1	U
78-93-3	<b>2-Butanone</b>	<b>16</b>	<b>41</b>	
71-55-6	1,1,1-Trichloroethane	3.1	< 3.1	U
56-23-5	Carbon Tetrachloride	3.1	< 3.1	U
108-05-4	Vinyl Acetate	16	< 16	U
75-27-4	Bromodichloromethane	3.1	< 3.1	U
78-87-5	1,2-Dichloropropane	3.1	< 3.1	U
10061-01-5	cis-1,3-Dichloropropene	3.1	< 3.1	U
79-01-6	Trichloroethene	3.1	< 3.1	U
124-48-1	Dibromochloromethane	3.1	< 3.1	U
79-00-5	1,1,2-Trichloroethane	3.1	< 3.1	U
71-43-2	Benzene	3.1	< 3.1	U
10061-02-6	trans-1,3-Dichloropropene	3.1	< 3.1	U
110-75-8	2-Chloroethylvinylether	16	< 16	U
75-25-2	Bromoform	3.1	< 3.1	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	16	< 16	U
591-78-6	2-Hexanone	16	< 16	U
127-18-4	Tetrachloroethene	3.1	< 3.1	U
79-34-5	1,1,2,2-Tetrachloroethane	3.1	< 3.1	U
108-88-3	Toluene	3.1	< 3.1	U
108-90-7	Chlorobenzene	3.1	< 3.1	U
100-41-4	Ethylbenzene	3.1	< 3.1	U
100-42-5	Styrene	3.1	< 3.1	U
75-69-4	Trichlorofluoromethane	3.1	< 3.1	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.2	< 6.2	U
179601-23-1	m,p-Xylene	3.1	< 3.1	U
95-47-6	o-Xylene	3.1	< 3.1	U
95-50-1	1,2-Dichlorobenzene	3.1	< 3.1	U
541-73-1	1,3-Dichlorobenzene	3.1	< 3.1	U
106-46-7	1,4-Dichlorobenzene	3.1	< 3.1	U
107-02-8	Acrolein	16	< 16	U
74-88-4	Iodomethane	3.1	< 3.1	UJ
74-96-4	Bromoethane	6.2	< 6.2	U
107-13-1	Acrylonitrile	16	< 16	U
563-58-6	1,1-Dichloropropene	3.1	< 3.1	U
74-95-3	Dibromomethane	3.1	< 3.1	U
630-20-6	1,1,1,2-Tetrachloroethane	3.1	< 3.1	U
96-12-8	1,2-Dibromo-3-chloropropane	16	< 16	U
96-18-4	1,2,3-Trichloropropane	6.2	< 6.2	U
110-57-6	trans-1,4-Dichloro-2-butene	16	< 16	U
108-67-8	1,3,5-Trimethylbenzene	3.1	< 3.1	U

*OK  
5/12/16*



Lab Sample ID: AZG9I  
 LIMS ID: 16-6080  
 Matrix: Soil  
 Date Analyzed: 04/20/16 14:32

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	3.1	< 3.1	U
87-68-3	Hexachlorobutadiene	16	< 16	U
106-93-4	1,2-Dibromoethane	3.1	< 3.1	U
74-97-5	Bromochloromethane	3.1	< 3.1	U
594-20-7	2,2-Dichloropropane	3.1	< 3.1	U
142-28-9	1,3-Dichloropropane	3.1	< 3.1	U
98-82-8	Isopropylbenzene	3.1	< 3.1	U
103-65-1	n-Propylbenzene	3.1	< 3.1	U
108-86-1	Bromobenzene	3.1	< 3.1	U
95-49-8	2-Chlorotoluene	3.1	< 3.1	U
106-43-4	4-Chlorotoluene	3.1	< 3.1	U
98-06-6	tert-Butylbenzene	3.1	< 3.1	U
135-98-8	sec-Butylbenzene	3.1	< 3.1	U
99-87-6	4-Isopropyltoluene	3.1	< 3.1	U
104-51-8	n-Butylbenzene	3.1	< 3.1	U
120-82-1	1,2,4-Trichlorobenzene	16	< 16	U
91-20-3	Naphthalene	16	< 16	U
87-61-6	1,2,3-Trichlorobenzene	16	< 16	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	140% Q
d8-Toluene	104%
Bromofluorobenzene	95.6%
d4-1,2-Dichlorobenzene	98.9%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: Trip Blank  
SAMPLE

Lab Sample ID: AZG9J  
LIMS ID: 16-6081  
Matrix: Water  
Data Release Authorized: *MW*  
Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100  
Date Sampled: 04/05/16  
Date Received: 04/15/16

Instrument/Analyst: NT5/PAB  
Date Analyzed: 04/19/16 18:51

Sample Amount: 5.00 mL  
Purge Volume: 5.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	<b>Methylene Chloride</b>	<b>2.0</b>	<b>3.1</b>	<b>Q</b>
67-64-1	Acetone	10	< 10	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	2.0	< 2.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U

*Cl  
still*

Lab Sample ID: AZG9J  
 LIMS ID: 16-6081  
 Matrix: Water  
 Date Analyzed: 04/19/16 18:51

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	10	< 10	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	5.0	< 5.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	126%
d8-Toluene	103%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	102%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: MB-041916A

METHOD BLANK

Lab Sample ID: MB-041916A

LIMS ID: 16-6072

Matrix: Soil

Data Release Authorized: *MW*

Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Date Sampled: NA

Date Received: NA

Instrument/Analyst: NT5/PAB

Date Analyzed: 04/19/16 12:12

Sample Amount: 5.00 g-dry-wt

Purge Volume: 5.0 mL

Moisture: NA

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

Lab Sample ID: MB-041916A  
LIMS ID: 16-6072  
Matrix: Soil  
Date Analyzed: 04/19/16 12:12

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	107%
d8-Toluene	102%
Bromofluorobenzene	99.1%
d4-1,2-Dichlorobenzene	99.7%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: MB-042016A  
METHOD BLANK

Lab Sample ID: MB-042016A  
LIMS ID: 16-6077  
Matrix: Soil  
Data Release Authorized: *MW*  
Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100  
Date Sampled: NA  
Date Received: NA

Instrument/Analyst: NT5/PAB  
Date Analyzed: 04/20/16 12:27

Sample Amount: 5.00 g-dry-wt  
Purge Volume: 5.0 mL  
Moisture: NA

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	1.0	< 1.0	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-00-3	Chloroethane	1.0	< 1.0	U
75-09-2	Methylene Chloride	2.0	< 2.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	1.0	< 1.0	U
75-35-4	1,1-Dichloroethene	1.0	< 1.0	U
75-34-3	1,1-Dichloroethane	1.0	< 1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	< 1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	< 1.0	U
67-66-3	Chloroform	1.0	< 1.0	U
107-06-2	1,2-Dichloroethane	1.0	< 1.0	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	1.0	< 1.0	U
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
108-05-4	Vinyl Acetate	5.0	< 5.0	U
75-27-4	Bromodichloromethane	1.0	< 1.0	U
78-87-5	1,2-Dichloropropane	1.0	< 1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
124-48-1	Dibromochloromethane	1.0	< 1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	< 1.0	U
110-75-8	2-Chloroethylvinylether	5.0	< 5.0	U
75-25-2	Bromoform	1.0	< 1.0	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
79-34-5	1,1,2,2-Tetrachloroethane	1.0	< 1.0	U
108-88-3	Toluene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
100-41-4	Ethylbenzene	1.0	< 1.0	U
100-42-5	Styrene	1.0	< 1.0	U
75-69-4	Trichlorofluoromethane	1.0	< 1.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	2.0	< 2.0	U
179601-23-1	m,p-Xylene	1.0	< 1.0	U
95-47-6	o-Xylene	1.0	< 1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	< 1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	2.0	< 2.0	U
107-13-1	Acrylonitrile	5.0	< 5.0	U
563-58-6	1,1-Dichloropropene	1.0	< 1.0	U
74-95-3	Dibromomethane	1.0	< 1.0	U
630-20-6	1,1,1,2-Tetrachloroethane	1.0	< 1.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	< 5.0	U
96-18-4	1,2,3-Trichloropropane	2.0	< 2.0	U
110-57-6	trans-1,4-Dichloro-2-butene	5.0	< 5.0	U
108-67-8	1,3,5-Trimethylbenzene	1.0	< 1.0	U

Lab Sample ID: MB-042016A  
LIMS ID: 16-6077  
Matrix: Soil  
Date Analyzed: 04/20/16 12:27

QC Report No: AZG9-AMEC Environment & Infrastructure  
Project: BoeingApronAAdditionalInvestigation  
88880100

CAS Number	Analyte	LOQ	Result	Q
95-63-6	1,2,4-Trimethylbenzene	1.0	< 1.0	U
87-68-3	Hexachlorobutadiene	5.0	< 5.0	U
106-93-4	1,2-Dibromoethane	1.0	< 1.0	U
74-97-5	Bromochloromethane	1.0	< 1.0	U
594-20-7	2,2-Dichloropropane	1.0	< 1.0	U
142-28-9	1,3-Dichloropropane	1.0	< 1.0	U
98-82-8	Isopropylbenzene	1.0	< 1.0	U
103-65-1	n-Propylbenzene	1.0	< 1.0	U
108-86-1	Bromobenzene	1.0	< 1.0	U
95-49-8	2-Chlorotoluene	1.0	< 1.0	U
106-43-4	4-Chlorotoluene	1.0	< 1.0	U
98-06-6	tert-Butylbenzene	1.0	< 1.0	U
135-98-8	sec-Butylbenzene	1.0	< 1.0	U
99-87-6	4-Isopropyltoluene	1.0	< 1.0	U
104-51-8	n-Butylbenzene	1.0	< 1.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	< 5.0	U
91-20-3	Naphthalene	5.0	< 5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	< 5.0	U

Reported in µg/kg (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	125%
d8-Toluene	103%
Bromofluorobenzene	99.8%
d4-1,2-Dichlorobenzene	99.5%

VOA SURROGATE RECOVERY SUMMARY



Matrix: Soil

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

ARI ID	Client ID	Level	DCE	TOL	BFB	DCB	TOT OUT
MB-041916A	Method Blank	Low	107%	102%	99.1%	99.7%	0
LCS-041916A	Lab Control	Low	113%	103%	97.6%	99.8%	0
LCSD-041916A	Lab Control Dup	Low	115%	103%	99.7%	101%	0
AZG9A	SB-GW264-00070	Low	138%	104%	99.3%	101%	0
AZG9B	SB-GW264-00150	Low	135%	104%	94.9%	99.5%	0
AZG9C	SB-GW262-00080	Low	139%	104%	103%	102%	0
AZG9D	SB-GW262-000150	Low	136%	103%	99.1%	98.7%	0
AZG9E	SB-GW265-00085	Low	138%	105%	99.8%	101%	0
MB-042016A	Method Blank	Low	125%	103%	99.8%	99.5%	0
LCS-042016A	Lab Control	Low	123% Q	103%	101%	100%	0
LCSD-042016A	Lab Control Dup	Low	128% Q	104%	99.9%	99.6%	0
AZG9F	SB-GW265-100085	Low	131% Q	103%	95.7%	98.7%	0
AZG9G	SB-GW265-00150	Low	146% Q	105%	103%	101%	0
AZG9H	SB-GW263-00075	Low	127% Q	105%	95.7%	102%	0
AZG9HMS	SB-GW263-00075	Low	136% Q	103%	98.0%	101%	0
AZG9HMSD	SB-GW263-00075	Low	142% Q	104%	102%	103%	0
AZG9I	SB-GW263-00150	Low	140% Q	104%	95.6%	98.9%	0

LCS/MB LIMITS

QC LIMITS

SW8260C	LCS/MB LIMITS		QC LIMITS	
	Low	Med	Low	Med
(DCE) = d4-1,2-Dichloroethane	80-149	80-124	78-151	80-124
(TOL) = d8-Toluene	77-120	80-120	80-120	80-120
(BFB) = Bromofluorobenzene	80-120	80-120	75-124	80-120
(DCB) = d4-1,2-Dichlorobenzene	80-120	80-120	80-120	80-120

Log Number Range: 16-6072 to 16-6080

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
AZG9J	Trip Blank	5	126%*	103%	101%	102%	1

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane  
 (TOL) = d8-Toluene  
 (BFB) = Bromofluorobenzene  
 (DCB) = d4-1,2-Dichlorobenzene

80-149  
 77-120  
 80-120  
 80-120

80-125  
 80-120  
 80-120  
 80-120

Prep Method: SW5030B  
 Log Number Range: 16-6081 to 16-6081

**ORGANICS ANALYSIS DATA SHEET**  
**Volatiles by P&T GC/MS-Method SW8260C**  
 Page 1 of 2

**Sample ID: LCS-041916A**  
**LAB CONTROL SAMPLE**

Lab Sample ID: LCS-041916A  
 LIMS ID: 16-6072  
 Matrix: Soil  
 Data Release Authorized: *MW*  
 Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100  
 Date Sampled: NA  
 Date Received: NA

Instrument/Analyst LCS: NT5/PAB  
 LCSD: NT5/PAB  
 Date Analyzed LCS: 04/19/16 11:27  
 LCSD: 04/19/16 11:50

Sample Amount LCS: 5.00 g-dry-wt  
 LCSD: 5.00 g-dry-wt  
 Purge Volume LCS: 5.0 mL  
 LCSD: 5.0 mL  
 Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	50.6	50.0	101%	54.8	50.0	110%	8.0%
Bromomethane	49.8	50.0	99.6%	52.8	50.0	106%	5.8%
Vinyl Chloride	54.9 Q	50.0	110%	59.4 Q	50.0	119%	7.9%
Chloroethane	68.9 Q	50.0	138%	75.1 Q	50.0	150%	8.6%
Methylene Chloride	56.3	50.0	113%	60.8	50.0	122%	7.7%
Acetone	256	250	102%	276	250	110%	7.5%
Carbon Disulfide	59.2 Q	50.0	118%	64.5 Q	50.0	129%	8.6%
1,1-Dichloroethene	58.0 Q	50.0	116%	62.6 Q	50.0	125%	7.6%
1,1-Dichloroethane	55.6 Q	50.0	111%	61.5 Q	50.0	123%	10.1%
trans-1,2-Dichloroethene	56.7 Q	50.0	113%	61.8 Q	50.0	124%	8.6%
cis-1,2-Dichloroethene	51.5	50.0	103%	55.7	50.0	111%	7.8%
Chloroform	50.2	50.0	100%	56.0	50.0	112%	10.9%
1,2-Dichloroethane	44.6	50.0	89.2%	47.7	50.0	95.4%	6.7%
2-Butanone	230	250	92.0%	262	250	105%	13.0%
1,1,1-Trichloroethane	50.7	50.0	101%	56.3	50.0	113%	10.5%
Carbon Tetrachloride	46.3	50.0	92.6%	49.7	50.0	99.4%	7.1%
Vinyl Acetate	51.8	50.0	104%	56.5	50.0	113%	8.7%
Bromodichloromethane	47.2	50.0	94.4%	50.6	50.0	101%	7.0%
1,2-Dichloropropane	44.9	50.0	89.8%	48.7	50.0	97.4%	8.1%
cis-1,3-Dichloropropene	46.4	50.0	92.8%	49.8	50.0	99.6%	7.1%
Trichloroethene	45.7	50.0	91.4%	48.8	50.0	97.6%	6.6%
Dibromochloromethane	44.3	50.0	88.6%	47.1	50.0	94.2%	6.1%
1,1,2-Trichloroethane	45.3	50.0	90.6%	47.6	50.0	95.2%	5.0%
Benzene	46.3	50.0	92.6%	49.5	50.0	99.0%	6.7%
trans-1,3-Dichloropropene	46.4	50.0	92.8%	48.8	50.0	97.6%	5.0%
2-Chloroethylvinylether	42.9	50.0	85.8%	44.8	50.0	89.6%	4.3%
Bromoform	41.7	50.0	83.4%	45.0	50.0	90.0%	7.6%
4-Methyl-2-Pentanone (MIBK)	217	250	86.8%	233	250	93.2%	7.1%
2-Hexanone	227	250	90.8%	245	250	98.0%	7.6%
Tetrachloroethene	43.3	50.0	86.6%	46.4	50.0	92.8%	6.9%
1,1,2,2-Tetrachloroethane	44.9	50.0	89.8%	48.2	50.0	96.4%	7.1%
Toluene	44.8	50.0	89.6%	47.4	50.0	94.8%	5.6%
Chlorobenzene	45.5	50.0	91.0%	48.7	50.0	97.4%	6.8%
Ethylbenzene	46.4	50.0	92.8%	50.5	50.0	101%	8.5%
Styrene	46.0	50.0	92.0%	49.4	50.0	98.8%	7.1%
Trichlorofluoromethane	77.8 Q	50.0	156%	83.0 Q	50.0	166%	6.5%
1,1,2-Trichloro-1,2,2-trifluoroetha	56.6 Q	50.0	113%	62.7 Q	50.0	125%	10.2%

Lab Sample ID: LCS-041916A  
 LIMS ID: 16-6072  
 Matrix: Soil

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

Analyte	LCS			LCSD			RPD
	LCS	Spike Added-LCS	Recovery	LCSD	Spike Added-LCSD	Recovery	
m,p-Xylene	91.5	100	91.5%	98.9	100	98.9%	7.8%
o-Xylene	44.2	50.0	88.4%	46.9	50.0	93.8%	5.9%
1,2-Dichlorobenzene	45.6	50.0	91.2%	48.7	50.0	97.4%	6.6%
1,3-Dichlorobenzene	47.3	50.0	94.6%	50.1	50.0	100%	5.7%
1,4-Dichlorobenzene	46.5	50.0	93.0%	49.6	50.0	99.2%	6.5%
Acrolein	267	250	107%	293	250	117%	9.3%
Iodomethane	45.8	50.0	91.6%	47.3	50.0	94.6%	3.2%
Bromoethane	55.7 Q	50.0	111%	60.4 Q	50.0	121%	8.1%
Acrylonitrile	49.2	50.0	98.4%	53.9	50.0	108%	9.1%
1,1-Dichloropropene	47.5	50.0	95.0%	51.1	50.0	102%	7.3%
Dibromomethane	45.2	50.0	90.4%	47.4	50.0	94.8%	4.8%
1,1,1,2-Tetrachloroethane	43.2	50.0	86.4%	46.6	50.0	93.2%	7.6%
1,2-Dibromo-3-chloropropane	43.0	50.0	86.0%	47.2	50.0	94.4%	9.3%
1,2,3-Trichloropropane	44.1	50.0	88.2%	46.4	50.0	92.8%	5.1%
trans-1,4-Dichloro-2-butene	45.6	50.0	91.2%	46.9	50.0	93.8%	2.8%
1,3,5-Trimethylbenzene	48.4	50.0	96.8%	51.7	50.0	103%	6.6%
1,2,4-Trimethylbenzene	48.4	50.0	96.8%	52.1	50.0	104%	7.4%
Hexachlorobutadiene	40.8	50.0	81.6%	45.8	50.0	91.6%	11.5%
1,2-Dibromoethane	44.1	50.0	88.2%	47.2	50.0	94.4%	6.8%
Bromochloromethane	50.3	50.0	101%	54.6	50.0	109%	8.2%
2,2-Dichloropropane	52.0	50.0	104%	56.9	50.0	114%	9.0%
1,3-Dichloropropane	45.1	50.0	90.2%	48.2	50.0	96.4%	6.6%
Isopropylbenzene	47.0	50.0	94.0%	51.5	50.0	103%	9.1%
n-Propylbenzene	50.2	50.0	100%	53.9	50.0	108%	7.1%
Bromobenzene	44.5	50.0	89.0%	47.8	50.0	95.6%	7.2%
2-Chlorotoluene	47.0	50.0	94.0%	51.7	50.0	103%	9.5%
4-Chlorotoluene	48.3	50.0	96.6%	52.1	50.0	104%	7.6%
tert-Butylbenzene	45.8	50.0	91.6%	50.3	50.0	101%	9.4%
sec-Butylbenzene	48.6	50.0	97.2%	53.1	50.0	106%	8.8%
4-Isopropyltoluene	49.1	50.0	98.2%	52.7	50.0	105%	7.1%
n-Butylbenzene	51.4 Q	50.0	103%	55.4 Q	50.0	111%	7.5%
1,2,4-Trichlorobenzene	47.4	50.0	94.8%	49.2	50.0	98.4%	3.7%
Naphthalene	46.3	50.0	92.6%	49.6	50.0	99.2%	6.9%
1,2,3-Trichlorobenzene	44.8	50.0	89.6%	48.9	50.0	97.8%	8.8%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d4-1,2-Dichloroethane	113%	115%
d8-Toluene	103%	103%
Bromofluorobenzene	97.6%	99.7%
d4-1,2-Dichlorobenzene	99.8%	101%

**ORGANICS ANALYSIS DATA SHEET**  
**Volatiles by P&T GC/MS-Method SW8260C**  
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Sample ID: LCS-042016A  
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-042016A  
 LIMS ID: 16-6077  
 Matrix: Soil  
 Data Release Authorized: *MW*  
 Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100  
 Date Sampled: NA  
 Date Received: NA

Instrument/Analyst LCS: NT5/PAB  
 LCSD: NT5/PAB  
 Date Analyzed LCS: 04/20/16 11:27  
 LCSD: 04/20/16 12:04

Sample Amount LCS: 5.00 g-dry-wt  
 LCSD: 5.00 g-dry-wt  
 Purge Volume LCS: 5.0 mL  
 LCSD: 5.0 mL  
 Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	54.7	50.0	109%	55.6	50.0	111%	1.6%
Bromomethane	44.6 Q	50.0	89.2%	45.3 Q	50.0	90.6%	1.6%
Vinyl Chloride	64.2	50.0	128%	62.2	50.0	124%	3.2%
Chloroethane	90.2 Q	50.0	180%	91.3 Q	50.0	183%	1.2%
Methylene Chloride	64.6	50.0	129%	71.4	50.0	143%	10.0%
Acetone	284	250	114%	283	250	113%	0.4%
Carbon Disulfide	72.5 Q	50.0	145%	68.7 Q	50.0	137%	5.4%
1,1-Dichloroethene	68.2 Q	50.0	136%	68.8 Q	50.0	138%	0.9%
1,1-Dichloroethane	64.3 Q	50.0	129%	65.9 Q	50.0	132%	2.5%
trans-1,2-Dichloroethene	65.8 Q	50.0	132%	65.9 Q	50.0	132%	0.2%
cis-1,2-Dichloroethene	54.9	50.0	110%	57.8	50.0	116%	5.1%
Chloroform	56.5	50.0	113%	58.9	50.0	118%	4.2%
1,2-Dichloroethane	46.1	50.0	92.2%	47.6	50.0	95.2%	3.2%
2-Butanone	252	250	101%	252	250	101%	0.0%
1,1,1-Trichloroethane	58.5	50.0	117%	59.3	50.0	119%	1.4%
Carbon Tetrachloride	49.9	50.0	99.8%	49.4	50.0	98.8%	1.0%
Vinyl Acetate	53.1	50.0	106%	54.9	50.0	110%	3.3%
Bromodichloromethane	48.9	50.0	97.8%	49.8	50.0	99.6%	1.8%
1,2-Dichloropropane	47.6	50.0	95.2%	48.6	50.0	97.2%	2.1%
cis-1,3-Dichloropropene	46.7	50.0	93.4%	48.6	50.0	97.2%	4.0%
Trichloroethene	49.3	50.0	98.6%	49.3	50.0	98.6%	0.0%
Dibromochloromethane	42.6	50.0	85.2%	44.4	50.0	88.8%	4.1%
1,1,2-Trichloroethane	43.0	50.0	86.0%	44.9	50.0	89.8%	4.3%
Benzene	49.4	50.0	98.8%	50.3	50.0	101%	1.8%
trans-1,3-Dichloropropene	46.0	50.0	92.0%	48.2	50.0	96.4%	4.7%
2-Chloroethylvinylether	42.7	50.0	85.4%	44.0	50.0	88.0%	3.0%
Bromoform	39.1	50.0	78.2%	40.5	50.0	81.0%	3.5%
4-Methyl-2-Pentanone (MIBK)	216	250	86.4%	219	250	87.6%	1.4%
2-Hexanone	230	250	92.0%	229	250	91.6%	0.4%
Tetrachloroethene	44.1	50.0	88.2%	44.7	50.0	89.4%	1.4%
1,1,2,2-Tetrachloroethane	45.4	50.0	90.8%	47.0	50.0	94.0%	3.5%
Toluene	47.0	50.0	94.0%	47.6	50.0	95.2%	1.3%
Chlorobenzene	47.3	50.0	94.6%	47.6	50.0	95.2%	0.6%
Ethylbenzene	50.2	50.0	100%	50.6	50.0	101%	0.8%
Styrene	47.4	50.0	94.8%	47.9	50.0	95.8%	1.0%
Trichlorofluoromethane	100 Q	50.0	200%	101 Q	50.0	202%	1.0%
1,1,2-Trichloro-1,2,2-trifluoroetha	68.5 Q	50.0	137%	69.2 Q	50.0	138%	1.0%

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: LCS-042016A

LAB CONTROL SAMPLE

Lab Sample ID: LCS-042016A

LIMS ID: 16-6077

Matrix: Soil

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
m,p-Xylene	97.8	100	97.8%	97.6	100	97.6%	0.2%
o-Xylene	45.2	50.0	90.4%	46.3	50.0	92.6%	2.4%
1,2-Dichlorobenzene	46.0	50.0	92.0%	45.9	50.0	91.8%	0.2%
1,3-Dichlorobenzene	48.0	50.0	96.0%	48.0	50.0	96.0%	0.0%
1,4-Dichlorobenzene	47.7	50.0	95.4%	48.4	50.0	96.8%	1.5%
Acrolein	290	250	116%	289	250	116%	0.3%
Iodomethane	37.1 Q	50.0	74.2%	39.6 Q	50.0	79.2%	6.5%
Bromoethane	64.2 Q	50.0	128%	63.0 Q	50.0	126%	1.9%
Acrylonitrile	54.0	50.0	108%	54.5	50.0	109%	0.9%
1,1-Dichloropropene	52.4	50.0	105%	52.6	50.0	105%	0.4%
Dibromomethane	45.6	50.0	91.2%	46.7	50.0	93.4%	2.4%
1,1,1,2-Tetrachloroethane	43.2	50.0	86.4%	44.5	50.0	89.0%	3.0%
1,2-Dibromo-3-chloropropane	44.7	50.0	89.4%	42.4	50.0	84.8%	5.3%
1,2,3-Trichloropropane	45.3	50.0	90.6%	44.4	50.0	88.8%	2.0%
trans-1,4-Dichloro-2-butene	46.4	50.0	92.8%	48.2	50.0	96.4%	3.8%
1,3,5-Trimethylbenzene	52.6	50.0	105%	53.2	50.0	106%	1.1%
1,2,4-Trimethylbenzene	52.4	50.0	105%	53.0	50.0	106%	1.1%
Hexachlorobutadiene	40.0	50.0	80.0%	41.1	50.0	82.2%	2.7%
1,2-Dibromoethane	42.1	50.0	84.2%	43.8	50.0	87.6%	4.0%
Bromochloromethane	50.3	50.0	101%	52.5	50.0	105%	4.3%
2,2-Dichloropropane	60.8	50.0	122%	61.2	50.0	122%	0.7%
1,3-Dichloropropane	45.7	50.0	91.4%	46.4	50.0	92.8%	1.5%
Isopropylbenzene	52.6	50.0	105%	52.6	50.0	105%	0.0%
n-Propylbenzene	56.5	50.0	113%	56.6	50.0	113%	0.2%
Bromobenzene	43.9	50.0	87.8%	44.6	50.0	89.2%	1.6%
2-Chlorotoluene	52.2	50.0	104%	53.0	50.0	106%	1.5%
4-Chlorotoluene	52.9	50.0	106%	53.6	50.0	107%	1.3%
tert-Butylbenzene	49.8	50.0	99.6%	50.6	50.0	101%	1.6%
sec-Butylbenzene	53.9	50.0	108%	54.3	50.0	109%	0.7%
4-Isopropyltoluene	53.2	50.0	106%	54.0	50.0	108%	1.5%
n-Butylbenzene	57.0	50.0	114%	58.6	50.0	117%	2.8%
1,2,4-Trichlorobenzene	44.1	50.0	88.2%	45.2	50.0	90.4%	2.5%
Naphthalene	44.6	50.0	89.2%	44.2	50.0	88.4%	0.9%
1,2,3-Trichlorobenzene	42.8	50.0	85.6%	42.6	50.0	85.2%	0.5%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	123% Q	128% Q
d8-Toluene	103%	104%
Bromofluorobenzene	101%	99.9%
d4-1,2-Dichlorobenzene	100%	99.6%

ORGANICS ANALYSIS DATA SHEET

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: SB-GW263-00075

MATRIX SPIKE

Lab Sample ID: AZG9H

LIMS ID: 16-6079

Matrix: Soil

Data Release Authorized: *MW*

Reported: 04/22/16

QC Report No: AZG9-AMEC Environment & Infrastructure

Project: BoeingApronAAdditionalInvestigation

88880100

Date Sampled: 04/15/16

Date Received: 04/15/16

Instrument/Analyst MS: NT5/PAB

MSD: NT5/PAB

Date Analyzed MS: 04/20/16 15:16

MSD: 04/20/16 15:39

Sample Amount MS: 3.81 g-dry-wt

MSD: 3.59 g-dry-wt

Purge Volume MS: 5.0 mL

MSD: 5.0 mL

Moisture: 24.2%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Chloromethane	< 1.5 U	64.1	65.6	97.7%	65.6	69.6	94.3%	2.3%
Bromomethane	< 1.5 U	53.1 Q	65.6	80.9%	51.6 Q	69.6	74.1%	2.9%
Vinyl Chloride	< 1.5 U	75.4	65.6	115%	70.9	69.6	102%	6.2%
Chloroethane	< 1.5 U	110 Q	65.6	168%	112 Q	69.6	161%	1.8%
Methylene Chloride	< 2.9 U	69.6	65.6	106%	68.4	69.6	98.3%	1.7%
Acetone	44	402	328	109%	396	348	101%	1.5%
Carbon Disulfide	< 1.5 U	83.7 U	65.6	128%	81.0 Q	69.6	116%	3.3%
1,1-Dichloroethene	< 1.5 U	84.0 Q	65.6	128%	81.6 Q	69.6	117%	2.9%
1,1-Dichloroethane	< 1.5 U	77.3 Q	65.6	118%	75.0 Q	69.6	108%	3.0%
trans-1,2-Dichloroethene	< 1.5 U	78.3 Q	65.6	119%	75.5 Q	69.6	108%	3.6%
cis-1,2-Dichloroethene	< 1.5 U	62.5	65.6	95.3%	59.9	69.6	86.1%	4.2%
Chloroform	< 1.5 U	66.3	65.6	101%	63.6	69.6	91.4%	4.2%
1,2-Dichloroethane	< 1.5 U	51.8	65.6	79.0%	47.6	69.6	68.4%	8.5%
2-Butanone	< 7.4 U	331	328	101%	327	348	94.0%	1.2%
1,1,1-Trichloroethane	< 1.5 U	69.9	65.6	107%	67.7	69.6	97.3%	3.2%
Carbon Tetrachloride	< 1.5 U	58.7	65.6	89.5%	56.2	69.6	80.7%	4.4%
Vinyl Acetate	< 7.4 U	61.3	65.6	93.4%	58.5	69.6	84.1%	4.7%
Bromodichloromethane	< 1.5 U	53.1	65.6	80.9%	48.3	69.6	69.4%	9.5%
1,2-Dichloropropane	< 1.5 U	53.0	65.6	80.8%	49.8	69.6	71.6%	6.2%
cis-1,3-Dichloropropene	< 1.5 U	50.5	65.6	77.0%	46.3	69.6	66.5%	8.7%
Trichloroethene	< 1.5 U	55.7	65.6	84.9%	51.9	69.6	74.6%	7.1%
Dibromochloromethane	< 1.5 U	46.0	65.6	70.1%	38.9	69.6	55.9%	16.7%
1,1,2-Trichloroethane	< 1.5 U	47.6	65.6	72.6%	42.3	69.6	60.8%	11.8%
Benzene	< 1.5 U	56.1	65.6	85.5%	53.3	69.6	76.6%	5.1%
trans-1,3-Dichloropropene	< 1.5 U	48.3	65.6	73.6%	42.3	69.6	60.8%	13.2%
2-Chloroethylvinylether	< 7.4 U	< 6.6 U	65.6	NA	< 7.0 U	69.6	NA	NA
Bromoform	< 1.5 U	46.5	65.6	70.9%	33.6	69.6	48.3%	32.2%
4-Methyl-2-Pentanone (MIBK)	< 7.4 U	261	328	79.6%	240	348	69.0%	8.4%
2-Hexanone	< 7.4 U	292	328	89.0%	252	348	72.4%	14.7%
Tetrachloroethene	< 1.5 U	48.7	65.6	74.2%	43.5	69.6	62.5%	11.3%
1,1,2,2-Tetrachloroethane	< 1.5 U	56.1	65.6	85.5%	40.6	69.6	58.3%	32.1%
Toluene	< 1.5 U	51.8	65.6	79.0%	48.5	69.6	69.7%	6.6%
Chlorobenzene	< 1.5 U	49.1	65.6	74.8%	41.7	69.6	59.9%	16.3%
Ethylbenzene	< 1.5 U	57.0	65.6	86.9%	49.1	69.6	70.5%	14.9%
Styrene	< 1.5 U	47.5	65.6	72.4%	36.5	69.6	52.4%	26.2%
Trichlorofluoromethane	< 1.5 U	129 Q	65.6	197%	131 Q	69.6	188%	1.5%
1,1,2-Trichloro-1,2,2-trifl	< 2.9 U	85.8 Q	65.6	131%	84.2 Q	69.6	121%	1.9%
m,p-Xylene	< 1.5 U	106	131	80.9%	89.8	139	64.6%	16.5%
o-Xylene	< 1.5 U	49.2	65.6	75.0%	40.4	69.6	58.0%	19.6%
1,2-Dichlorobenzene	< 1.5 U	41.4	65.6	63.1%	26.2	69.6	37.6%	45.0%
1,3-Dichlorobenzene	< 1.5 U	45.9	65.6	70.0%	29.7	69.6	42.7%	42.9%
1,4-Dichlorobenzene	< 1.5 U	44.2	65.6	67.4%	28.5	69.6	40.9%	43.2%

Lab Sample ID: AZG9H  
 LIMS ID: 16-6079  
 Matrix: Soil

QC Report No: AZG9-AMEC Environment & Infrastructure  
 Project: BoeingApronAAdditionalInvestigation  
 88880100

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Acrolein	< 7.4 U	328	328	100%	284	348	81.6%	14.4%
Iodomethane	< 1.5 U	32.3 Q	65.6	49.2%	35.2 Q	69.6	50.6%	8.6%
Bromoethane	< 2.9 U	74.9 Q	65.6	114%	72.0 Q	69.6	103%	3.9%
Acrylonitrile	< 7.4 U	63.9	65.6	97.4%	63.5	69.6	91.2%	0.6%
1,1-Dichloropropene	< 1.5 U	60.7	65.6	92.5%	57.8	69.6	83.0%	4.9%
Dibromomethane	< 1.5 U	47.7	65.6	72.7%	44.4	69.6	63.8%	7.2%
1,1,1,2-Tetrachloroethane	< 1.5 U	48.5	65.6	73.9%	40.1	69.6	57.6%	19.0%
1,2-Dibromo-3-chloropropane	< 7.4 U	52.7	65.6	80.3%	37.0	69.6	53.2%	35.0%
1,2,3-Trichloropropane	< 2.9 U	54.7	65.6	83.4%	40.5	69.6	58.2%	29.8%
trans-1,4-Dichloro-2-butene	< 7.4 U	55.9	65.6	85.2%	42.1	69.6	60.5%	28.2%
1,3,5-Trimethylbenzene	< 1.5 U	59.6	65.6	90.9%	42.8	69.6	61.5%	32.8%
1,2,4-Trimethylbenzene	< 1.5 U	56.4	65.6	86.0%	40.8	69.6	58.6%	32.1%
Hexachlorobutadiene	< 7.4 U	30.5	65.6	46.5%	22.9	69.6	32.9%	28.5%
1,2-Dibromoethane	< 1.5 U	44.6	65.6	68.0%	40.2	69.6	57.8%	10.4%
Bromochloromethane	< 1.5 U	54.6	65.6	83.2%	51.7	69.6	74.3%	5.5%
2,2-Dichloropropane	< 1.5 U	73.6	65.6	112%	71.0	69.6	102%	3.6%
1,3-Dichloropropane	< 1.5 U	50.6	65.6	77.1%	43.2	69.6	62.1%	15.8%
Isopropylbenzene	< 1.5 U	63.3	65.6	96.5%	48.6	69.6	69.8%	26.3%
n-Propylbenzene	< 1.5 U	64.8	65.6	98.8%	48.4	69.6	69.5%	29.0%
Bromobenzene	< 1.5 U	46.3	65.6	70.6%	32.6	69.6	46.8%	34.7%
2-Chlorotoluene	< 1.5 U	57.6	65.6	87.8%	41.6	69.6	59.8%	32.3%
4-Chlorotoluene	< 1.5 U	56.0	65.6	85.4%	40.3	69.6	57.9%	32.6%
tert-Butylbenzene	< 1.5 U	56.1	65.6	85.5%	41.6	69.6	59.8%	29.7%
sec-Butylbenzene	< 1.5 U	58.5	65.6	89.2%	42.9	69.6	61.6%	30.8%
4-Isopropyltoluene	< 1.5 U	56.0	65.6	85.4%	40.2	69.6	57.8%	32.8%
n-Butylbenzene	< 1.5 U	56.9	65.6	86.7%	40.6	69.6	58.3%	33.4%
1,2,4-Trichlorobenzene	< 7.4 U	29.6	65.6	45.1%	16.3	69.6	23.4%	58.0%
Naphthalene	< 7.4 U	30.6	65.6	46.6%	16.7	69.6	24.0%	58.8%
1,2,3-Trichlorobenzene	< 7.4 U	26.5	65.6	40.4%	13.3	69.6	19.1%	66.3%

Reported in µg/kg (ppb)

NA-No recovery due to high concentration of analyte in original sample, calculated negative recovery, or undetected spike.  
 RPD calculated using sample concentrations per SW846.

SAMPLE RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructur



Matrix: Soil  
Data Release Authorized: w  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: 04/14/16  
Date Received: 04/15/16

Client ID: SB-GW264-00150  
ARI ID: 16-6073 AZG9B

Analyte	Date	Method	Units	RL	Sample
Total Solids	04/18/16 041816#1	SM2540G	Percent	0.01	31.93
Total Organic Carbon	04/20/16 042016#1	Plumb,1981	Percent	0.020	5.94

RL Analytical reporting limit  
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: *U*  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: 04/14/16  
Date Received: 04/15/16

Client ID: SB-GW262-000150  
ARI ID: 16-6075 AZG9D

Analyte	Date	Method	Units	RL	Sample
Total Solids	04/18/16 041816#1	SM2540G	Percent	0.01	50.42
Total Organic Carbon	04/20/16 042016#1	Plumb,1981	Percent	0.020	4.30

RL Analytical reporting limit  
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: *W*  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: 04/14/16  
Date Received: 04/15/16

Client ID: SB-GW265-00150  
ARI ID: 16-6078 AZG9G

Analyte	Date	Method	Units	RL	Sample
Total Solids	04/18/16 041816#1	SM2540G	Percent	0.01	83.03
Total Organic Carbon	04/20/16 042016#1	Plumb,1981	Percent	0.020	0.174

RL Analytical reporting limit  
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: w  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: 04/15/16  
Date Received: 04/15/16

Client ID: SB-GW263-00150  
ARI ID: 16-6080 AZG9I

Analyte	Date	Method	Units	RL	Sample
Total Solids	04/18/16 041816#1	SM2540G	Percent	0.01	42.17
Total Organic Carbon	04/20/16 042016#1	Plumb,1981	Percent	0.020	4.70

RL Analytical reporting limit  
U Undetected at reported detection limit

METHOD BLANK RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: W  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: NA  
Date Received: NA

Analyte	Date	Units	Blank	QC ID
Total Solids	04/18/16	Percent	< 0.01 U	ICB
Total Organic Carbon	04/20/16	Percent	< 0.020 U	ICB

LAB CONTROL RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: *W*  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: NA  
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Total Organic Carbon Plumb, 1981	ICVL	04/20/16	Percent	0.101	0.100	101.0%

STANDARD REFERENCE RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: *w*  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: NA  
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
Total Organic Carbon NIST 1941B	04/20/16	Percent	2.92	2.99	97.7%

REPLICATE RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: *w*  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: 04/14/16  
Date Received: 04/15/16

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: AZG9B Client ID: SB-GW264-00150					
Total Solids	04/18/16	Percent	31.93	29.03 30.23	4.8%
Total Organic Carbon	04/20/16	Percent	5.94	4.88 7.21	19.4%

MS/MSD RESULTS-CONVENTIONALS  
AZG9-AMEC Environment & Infrastructure



Matrix: Soil  
Data Release Authorized: *W*  
Reported: 04/20/16

Project: BoeingApronAAdditionalInvest  
Event: 88880100  
Date Sampled: 04/14/16  
Date Received: 04/15/16

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
<b>ARI ID: AZG9B    Client ID: SB-GW264-00150</b>						
Total Organic Carbon	04/20/16	Percent	5.94	19.4	13.8	97.5%



**Analytical Resources, Incorporated**  
Analytical Chemists and Consultants

April 26, 2016

Crystal Neirby  
AMEC Environment & Infrastructure  
One Union Square  
600 University Street, Suite 600  
Seattle, WA 98101

**RE: Project: Boeing Apron A Additional Sampling**  
**ARI Job: AZK1**

Dear Crystal,

Please find enclosed the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted five water samples and a trip blank in good condition on April 19, 2016. Please see cooler receipt form for discrepancies.

The samples were analyzed for VOCs and SIM VOCs as requested on the COC.

The VOCS LCS is out of control low for Dibromochloromethane.

The VOCs CCAL is out of control low for all associated FORM III "Q" flagged analytes. All associated samples that contain analyte have been flagged with a "Q" qualifier.

The VOCs matrix spike and/or matrix spike duplicate are out of control low for Carbon Tetrachloride, Dibromochloromethane, Bromoform, and Trans-1,3-Dichloropropene.

The SIM VOCs matrix spike and/or matrix spike duplicate are out of control high for Vinyl Chloride, and 1,1-Dichloroethene.

There were no other anomalies associated with the samples.

Quality control analysis results are included for your review. An electronic copy of this report and all associated raw data will be kept on file at ARI. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,  
ANALYTICAL RESOURCES, INC.

  
Kelly Bottem  
Client Services Manager  
(206) 695-6211  
[kellyb@arilabs.com](mailto:kellyb@arilabs.com)



# Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated  
 Analytical Chemists and Consultants  
 4611 South 134th Place, Suite 100  
 Tukwila, WA 98168  
 206-695-6200 206-695-6201 (fax)  
 www.arilabs.com

ARI Assigned Number: **AZK1** Turn-around Requested: **7 Days**  
 Page: **1** of **1**  
 ARI Client Company: **AMEC Foster Wheeler** Phone: **781-724-1019**  
 Date: **4/19/16** Ice Present? **Yes**  
 Client Contact: **Cystal Thimsen** Cooler Temps: **5.3**  
 No. of Coolers: **1**

Client Project Name: **Boeing Apron A Additional Investigation**  
 Client Project #: **88880100**  
 Samplers: **S. Bellamy**

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					GC/MS	GC/MS/MS	GC/MS/MS	GC/MS/MS	
RGW265-041916	4/19/16	8:40	Water	3	X	X	X	X	ms/msd
RGW263-041916	↓	10:00	↓	6	X	X	X	X	
RGW26A-041916	↓	11:10	↓	3	X	X	X	X	
RGW26B-041916	↓	12:00	↓	3	X	X	X	X	
DUP-01-041916	↓	00:01	↓	3	X	X	X	X	
Tri-BLANK-041916	↓	-	↓	2	X	X	X	X	
<del>Jennifer Bellamy</del>									
Comments/Special Instructions <b>Gene results to Doris Turner</b>	Relinquished by: (Signature) <b>Jennifer Bellamy</b>	Received by: (Signature) <b>Jennifer Bellamy</b>	Relinquished by: (Signature)	Received by: (Signature)					
	Printed Name: <b>Jennifer Bellamy</b>	Printed Name: <b>Jennifer Bellamy</b>	Printed Name: <b>Jennifer Bellamy</b>	Printed Name: <b>Jennifer Bellamy</b>					
Company: <b>AMEC</b>		Company: <b>AMEC</b>		Company: <b>ARI</b>		Company: <b>ARI</b>		Company:	
Date & Time: <b>4/19/16 1320</b>		Date & Time: <b>4/19/16 1320</b>		Date & Time: <b>4-19-16 1320</b>		Date & Time:		Date & Time:	

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



# Cooler Receipt Form

ARI Client: Boeing  
 COC No(s): \_\_\_\_\_ NA  
 Assigned ARI Job No: AZK1

Project Name: Boeing Aeron A Additional Invest  
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
 Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO  
 Were custody papers included with the cooler? ..... YES NO  
 Were custody papers properly filled out (ink, signed, etc.) ..... YES NO  
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.3  
 Time: \_\_\_\_\_  
 If cooler temperature is out of compliance fill out form 00070F  
 Cooler Accepted by: TR Date: 4-19-16 Time: 1320 Temp Gun ID#: D005276

*Complete custody forms and attach all shipping documents*

**Log-In Phase:**

Was a temperature blank included in the cooler? ..... YES NO  
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_  
 Was sufficient ice used (if appropriate)? ..... NA YES NO  
 Were all bottles sealed in individual plastic bags? ..... YES NO  
 Did all bottles arrive in good condition (unbroken)? ..... YES NO  
 Were all bottle labels complete and legible? ..... YES NO  
 Did the number of containers listed on COC match with the number of containers received? ..... YES NO  
 Did all bottle labels and tags agree with custody papers? ..... YES NO  
 Were all bottles used correct for the requested analyses? ..... YES NO  
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO  
 Were all VOC vials free of air bubbles? ..... NA YES NO  
 Was sufficient amount of sample sent in each bottle? ..... SM YES NO  
 Date VOC Trip Blank was made at ARI: NA 4/11/16  
 Was Sample Split by ARI : NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_  
 Samples Logged by: JM Date: 4/19/16 Time: 1400

**\*\* Notify Project Manager of discrepancies or concerns \*\***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:  
peabubbles in 1 of 3 vials of sample (DUP-01-04-19-16)  
 By: JM Date: 4/19/16

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)

# Sample ID Cross Reference Report



ARI Job No: AZK1  
Client: AMEC Environment & Infrastructure  
Project Event: 88880100  
Project Name: Boeng Apron A Additional Sampling

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. RGW265-041916	AZK1A	16-6146	Water	04/19/16 08:40	04/19/16 13:20
2. RGW263-041916	AZK1B	16-6147	Water	04/19/16 10:00	04/19/16 13:20
3. RGW264-041916	AZK1C	16-6148	Water	04/19/16 11:10	04/19/16 13:20
4. RGW262-041916	AZK1D	16-6149	Water	04/19/16 12:00	04/19/16 13:20
5. Dup-01-041916	AZK1E	16-6150	Water	04/19/16 00:01	04/19/16 13:20
6. Trip Blanks	AZK1F	16-6151	Water	04/11/16	04/19/16 13:20

## RE: Apron A Groundwater Samples

Thimsen, Crystal <crystal.thimsen@amecfw.com>

Wed 4/20/2016 10:34 AM

To: Kelly Bottem <kellyb@arilabs.com>;

Cc: Long, John <john.long@amecfw.com>; Bellamy, Jennifer <jennifer.bellamy@amecfw.com>; Paul Campbell <paul@arilabs.com>; Patrick Basilio <patrickb@arilabs.com>; Lani Hertzog <lanih@arilabs.com>;

Thanks Kelly, extra volume requirements noted. If there are data that have to be sacrificed, SIM data takes priority.

Thanks,  
Crystal

---

**From:** Kelly Bottem [mailto:kellyb@arilabs.com]

**Sent:** Wednesday, April 20, 2016 10:32 AM

**To:** Thimsen, Crystal <crystal.thimsen@amec.com>

**Cc:** Long, John <John.Long@amec.com>; Bellamy, Jennifer <jennifer.bellamy@amec.com>; Paul Campbell <paul@arilabs.com>; Patrick Basilio <patrickb@arilabs.com>; Lani Hertzog <lanih@arilabs.com>

**Subject:** Re: Apron A Groundwater Samples

We will add them. Also note that she only collected three vials for VOCs and sim. We need 5 for two analysis. You may not get sim data if the runs have issues.

K

Kelly Frances Bottem, Client Services Manager

Analytical Resources, Inc.

4611 S. 134th Place, Suite 100

Tukwila, WA 98168-3240

Website: <http://www.arilabs.com>

Direct Phone: [206-695-6211](tel:206-695-6211)

E-Mail: [kellyb@arilabs.com](mailto:kellyb@arilabs.com)

Fax: [206-695-6201](tel:206-695-6201)

Cell: [206-228-1385](tel:206-228-1385)

"Never interrupt someone doing something you said couldn't be done" - Amelia Earhart

\*\*\*Before printing, think about ENVIRONMENTAL responsibility

## **Analytical Resources, Incorporated**

Analytical Chemists and Consultants

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[arilabs.com]ARI Labs, Inc.

**From:** Thimsen, Crystal <[crystal.thimsen@amecfw.com](mailto:crystal.thimsen@amecfw.com)>  
**Sent:** Wednesday, April 20, 2016 9:51 AM  
**To:** Kelly Bottem  
**Cc:** Long, John; Bellamy, Jennifer  
**Subject:** Apron A Groundwater Samples

Hi Kelly,

The following compounds need SIM for the Apron A samples that were submitted either yesterday or this morning:

1,1-dichloroethene

Cis-1,2-dichloroethene

Tetrachloroethene

Trichloroethene

Vinyl chloride

Thanks,  
Crystal

### Crystal Thimsen

Senior Scientist, Environment and Infrastructure, Amec Foster Wheeler

600 University Street, Suite 600, Seattle, WA 98101

T 206 342 1760 D 206 838 8469 M 781 724 1019

[crystal.thimsen@amecfw.com](mailto:crystal.thimsen@amecfw.com) amecfw.com



amec  
foster  
wheeler

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## Data Reporting Qualifiers

Effective 12/31/13

### Inorganic Data

- U Indicates that the target analyte was not detected at the reported concentration
- \* Duplicate RPD is not within established control limits
- B Reported value is less than the CRDL but  $\geq$  the Reporting Limit
- N Matrix Spike recovery not within established control limits
- NA Not Applicable, analyte not spiked
- H The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- L Analyte concentration is  $\leq 5$  times the Reporting Limit and the replicate control limit defaults to  $\pm 1$  RL instead of the normal 20% RPD

### Organic Data

- U Indicates that the target analyte was not detected at the reported concentration
- \* Flagged value is not within established control limits
- B Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
- J Estimated concentration when the value is less than ARI's established reporting limits
- D The spiked compound was not detected due to sample extract dilution
- E Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.



- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).
- S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
- NA The flagged analyte was not analyzed for
- NR Spiked compound recovery is not reported due to chromatographic interference
- NS The flagged analyte was not spiked into the sample
- M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
- N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
- Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
- EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
- C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
- P The analyte was detected on both chromatographic columns but the quantified values differ by  $\geq 40\%$  RPD with no obvious chromatographic interference
- X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
- Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**




## Geotechnical Data

- A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
- F Samples were frozen prior to particle size determination
- SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
- SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
- W Weight of sample in some pipette aliquots was below the level required for accurate weighting

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 1 of 2

Sample ID: RGW265-041916  
SAMPLE

Lab Sample ID: AZK1A  
LIMS ID: 16-6146  
Matrix: Water  
Data Release Authorized:   
Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure  
Project: Boeng Apron A Additional Sampling  
88880100  
Date Sampled: 04/19/16  
Date Received: 04/19/16

Instrument/Analyst: NT2/PKC  
Date Analyzed: 04/22/16 12:26

Sample Amount: 10.0 mL  
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
<b>75-01-4</b>	<b>Vinyl Chloride</b>	<b>0.20</b>	<b>0.38</b>	<b>R1</b>
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U R1
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
<b>156-59-2</b>	<b>cis-1,2-Dichloroethene</b>	<b>0.20</b>	<b>0.24</b>	<b>R1</b>
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U R1
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U R1
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

CF  
5/12/16

Lab Sample ID: AZK1A  
 LIMS ID: 16-6146  
 Matrix: Water  
 Date Analyzed: 04/22/16 12:26

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	99.8%
d8-Toluene	98.4%
Bromofluorobenzene	93.4%
d4-1,2-Dichlorobenzene	100%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: RGW263-041916

SAMPLE

Lab Sample ID: AZK1B

LIMS ID: 16-6147

Matrix: Water

Data Release Authorized: *AS*

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 12:48

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
<b>75-01-4</b>	<b>Vinyl Chloride</b>	<b>0.20</b>	<b>1.0</b>	<b>R1</b>
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
<b>67-64-1</b>	<b>Acetone</b>	<b>5.0</b>	<b>16</b>	
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	UR1
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	UR1
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	UR1
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	UR1
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
<b>108-88-3</b>	<b>Toluene</b>	<b>0.20</b>	<b>0.95</b>	
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

*CF  
5/12/16*

Lab Sample ID: AZK1B  
 LIMS ID: 16-6147  
 Matrix: Water  
 Date Analyzed: 04/22/16 12:48

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in ug/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	101%
d8-Toluene	100%
Bromofluorobenzene	97.2%
d4-1,2-Dichlorobenzene	99.4%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: RGW264-041916

SAMPLE

Lab Sample ID: AZK1C

LIMS ID: 16-6148

Matrix: Water

Data Release Authorized: *AB*

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 13:09

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
<b>75-01-4</b>	<b>Vinyl Chloride</b>	<b>0.20</b>	<b>6.8</b>	<b>R1</b>
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
<b>67-64-1</b>	<b>Acetone</b>	<b>5.0</b>	<b>23</b>	
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U R1
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U R1
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>5.0</b>	<b>5.6</b>	
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U R1
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U R1
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
<b>108-88-3</b>	<b>Toluene</b>	<b>0.20</b>	<b>0.46</b>	
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

*CL  
5/12/16*

Lab Sample ID: AZK1C  
 LIMS ID: 16-6148  
 Matrix: Water  
 Date Analyzed: 04/22/16 13:09

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	98.4%
d8-Toluene	99.8%
Bromofluorobenzene	93.0%
d4-1,2-Dichlorobenzene	102%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: RGW262-041916

SAMPLE

Lab Sample ID: AZK1D

LIMS ID: 16-6149

Matrix: Water

Data Release Authorized:

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 13:30

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
<b>75-01-4</b>	<b>Vinyl Chloride</b>	<b>0.20</b>	<b>1.5</b>	<b>RI</b>
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
<b>67-64-1</b>	<b>Acetone</b>	<b>5.0</b>	<b>25</b>	
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	UR
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	UR
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
<b>78-93-3</b>	<b>2-Butanone</b>	<b>5.0</b>	<b>5.5</b>	
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	UR
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	UR
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
<b>108-88-3</b>	<b>Toluene</b>	<b>0.20</b>	<b>1.4</b>	
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

GT  
5/12/16

Lab Sample ID: AZK1D  
 LIMS ID: 16-6149  
 Matrix: Water  
 Date Analyzed: 04/22/16 13:30

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	102%
d8-Toluene	97.8%
Bromofluorobenzene	95.0%
d4-1,2-Dichlorobenzene	101%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: Dup-01-041916

SAMPLE

Lab Sample ID: AZK1E

LIMS ID: 16-6150

Matrix: Water

Data Release Authorized: *AS*

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 13:52

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
<b>75-01-4</b>	<b>Vinyl Chloride</b>	<b>0.20</b>	<b>0.34</b>	<b>RI</b>
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	UR
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
<b>156-59-2</b>	<b>cis-1,2-Dichloroethene</b>	<b>0.20</b>	<b>0.22</b>	<b>RI</b>
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	UR
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	UR
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

*CA  
5/12/16*

Lab Sample ID: AZK1E  
 LIMS ID: 16-6150  
 Matrix: Water  
 Date Analyzed: 04/22/16 13:52

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	101%
d8-Toluene	99.6%
Bromofluorobenzene	92.6%
d4-1,2-Dichlorobenzene	96.8%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: Trip Blanks  
SAMPLE

Lab Sample ID: AZK1F

LIMS ID: 16-6151

Matrix: Water

Data Release Authorized:

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/11/16

Date Received: 04/19/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 12:05

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

Lab Sample ID: AZK1F  
 LIMS ID: 16-6151  
 Matrix: Water  
 Date Analyzed: 04/22/16 12:05

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	100%
d8-Toluene	101%
Bromofluorobenzene	93.8%
d4-1,2-Dichlorobenzene	103%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

VOA SURROGATE RECOVERY SUMMARY



Matrix: Water

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-042216A	Method Blank	10	100%	100%	92.8%	104%	0
LCS-042216A	Lab Control	10	96.2%	99.2%	97.4%	100%	0
LCSD-042216A	Lab Control Dup	10	95.0%	99.6%	101%	102%	0
AZK1A	RGW265-041916	10	99.8%	98.4%	93.4%	100%	0
AZK1B	RGW263-041916	10	101%	100%	97.2%	99.4%	0
AZK1BMS	RGW263-041916	10	101%	99.2%	101%	101%	0
AZK1BMSD	RGW263-041916	10	102%	99.8%	98.6%	99.4%	0
AZK1C	RGW264-041916	10	98.4%	99.8%	93.0%	102%	0
AZK1D	RGW262-041916	10	102%	97.8%	95.0%	101%	0
AZK1E	Dup-01-041916	10	101%	99.6%	92.6%	96.8%	0
AZK1F	Trip Blanks	10	100%	101%	93.8%	103%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

(DCE) = d4-1,2-Dichloroethane	(80-129)	(80-129)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B  
 Log Number Range: 16-6146 to 16-6151

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2


Sample ID: RGW263-041916

MATRIX SPIKE

Lab Sample ID: AZK1B

LIMS ID: 16-6147

Matrix: Water

Data Release Authorized: 

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst MS: NT2/PKC

MSD: NT2/PKC

Date Analyzed MS: 04/22/16 18:30

MSD: 04/22/16 18:51

Sample Amount MS: 10.0 mL

MSD: 10.0 mL

Purge Volume MS: 10.0 mL

MSD: 10.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Chloromethane	< 0.50 U	9.16	10.0	91.6%	9.52	10.0	95.2%	3.9%
Bromomethane	< 1.0 U	10.0	10.0	100%	10.2	10.0	102%	2.0%
Vinyl Chloride	1.0	10.2	10.0	92.0%	10.6	10.0	96.0%	3.8%
Chloroethane	< 0.20 U	10.5	10.0	105%	11.2	10.0	112%	6.5%
Methylene Chloride	< 1.0 U	8.93	10.0	89.3%	9.22	10.0	92.2%	3.2%
Acetone	16	59.8	50.0	87.6%	61.4	50.0	90.8%	2.6%
Carbon Disulfide	< 0.20 U	8.52	10.0	85.2%	8.80	10.0	88.0%	3.2%
1,1-Dichloroethene	< 0.20 U	8.88	10.0	88.8%	9.04	10.0	90.4%	1.8%
1,1-Dichloroethane	< 0.20 U	9.19	10.0	91.9%	9.41	10.0	94.1%	2.4%
trans-1,2-Dichloroethene	< 0.20 U	8.81	10.0	88.1%	9.08	10.0	90.8%	3.0%
cis-1,2-Dichloroethene	< 0.20 U	9.49	10.0	94.9%	9.75	10.0	97.5%	2.7%
Chloroform	< 0.20 U	9.35	10.0	93.5%	9.58	10.0	95.8%	2.4%
1,2-Dichloroethane	< 0.20 U	9.36	10.0	93.6%	9.80	10.0	98.0%	4.6%
2-Butanone	< 5.0 U	48.2	50.0	96.4%	50.3	50.0	101%	4.3%
1,1,1-Trichloroethane	< 0.20 U	8.75	10.0	87.5%	9.08	10.0	90.8%	3.7%
Carbon Tetrachloride	< 0.20 U	6.48	10.0	64.8%	7.00	10.0	70.0%	7.7%
Vinyl Acetate	< 0.20 U	7.33	10.0	73.3%	7.77	10.0	77.7%	5.8%
Bromodichloromethane	< 0.20 U	8.89	10.0	88.9%	9.36	10.0	93.6%	5.2%
1,2-Dichloropropane	< 0.20 U	9.21	10.0	92.1%	9.66	10.0	96.6%	4.8%
cis-1,3-Dichloropropene	< 0.20 U	9.04	10.0	90.4%	9.45	10.0	94.5%	4.4%
Trichloroethene	< 0.20 U	9.34	10.0	93.4%	9.47	10.0	94.7%	1.4%
Dibromochloromethane	< 0.20 U	6.48 Q	10.0	64.8%	6.85 Q	10.0	68.5%	5.6%
1,1,2-Trichloroethane	< 0.20 U	9.46	10.0	94.6%	9.99	10.0	99.9%	5.4%
Benzene	< 0.20 U	9.55	10.0	95.5%	9.81	10.0	98.1%	2.7%
trans-1,3-Dichloropropene	< 0.20 U	7.33	10.0	73.3%	7.86	10.0	78.6%	7.0%
2-Chloroethylvinylether	< 1.0 U	< 1.00 U	10.0	NA	< 1.00 U	10.0	NA	NA
Bromoform	< 0.20 U	5.56 Q	10.0	55.6%	5.89 Q	10.0	58.9%	5.8%
4-Methyl-2-Pentanone (MIBK)	< 5.0 U	46.9	50.0	93.8%	48.4	50.0	96.8%	3.1%
2-Hexanone	< 5.0 U	47.1	50.0	94.2%	47.9	50.0	95.8%	1.7%
Tetrachloroethene	< 0.20 U	9.15	10.0	91.5%	9.30	10.0	93.0%	1.6%
1,1,2,2-Tetrachloroethane	< 0.20 U	9.34	10.0	93.4%	9.49	10.0	94.9%	1.6%
Toluene	0.95	10.0	10.0	90.5%	10.3	10.0	93.5%	3.0%
Chlorobenzene	< 0.20 U	9.38	10.0	93.8%	9.51	10.0	95.1%	1.4%
Ethylbenzene	< 0.20 U	9.29	10.0	92.9%	9.36	10.0	93.6%	0.8%
Styrene	< 0.20 U	9.99	10.0	99.9%	10.1	10.0	101%	1.1%
Trichlorofluoromethane	< 0.20 U	9.02	10.0	90.2%	9.07	10.0	90.7%	0.6%
1,1,2-Trichloro-1,2,2-trifl	< 0.20 U	8.62	10.0	86.2%	8.55	10.0	85.5%	0.8%
m,p-Xylene	< 0.40 U	19.6	20.0	98.0%	19.9	20.0	99.5%	1.5%
o-Xylene	< 0.20 U	9.51	10.0	95.1%	9.69	10.0	96.9%	1.9%
1,2-Dichlorobenzene	< 0.20 U	9.44	10.0	94.4%	9.53	10.0	95.3%	0.9%
1,3-Dichlorobenzene	< 0.20 U	9.53	10.0	95.3%	9.59	10.0	95.9%	0.6%
1,4-Dichlorobenzene	< 0.20 U	8.95	10.0	89.5%	9.14	10.0	91.4%	2.1%
Acrolein	< 5.0 U	43.8	50.0	87.6%	44.9	50.0	89.8%	2.5%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: RGW263-041916

MATRIX SPIKE

Lab Sample ID: AZK1B

LIMS ID: 16-6147

Matrix: Water

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Iodomethane	< 1.0 U	8.69	10.0	86.9%	10.0	10.0	100%	14.0%
Bromoethane	< 0.20 U	9.05	10.0	90.5%	9.20	10.0	92.0%	1.6%
Acrylonitrile	< 1.0 U	9.25	10.0	92.5%	9.84	10.0	98.4%	6.2%
1,1-Dichloropropene	< 0.20 U	8.93	10.0	89.3%	9.25	10.0	92.5%	3.5%
Dibromomethane	< 0.20 U	9.47	10.0	94.7%	9.51	10.0	95.1%	0.4%
1,1,1,2-Tetrachloroethane	< 0.20 U	8.83	10.0	88.3%	9.18	10.0	91.8%	3.9%
1,2-Dibromo-3-chloropropane	< 0.50 U	6.71 Q	10.0	67.1%	6.96 Q	10.0	69.6%	3.7%
1,2,3-Trichloropropane	< 0.50 U	9.74	10.0	97.4%	10.0	10.0	100%	2.6%
trans-1,4-Dichloro-2-butene	< 1.0 U	8.88	10.0	88.8%	9.09	10.0	90.9%	2.3%
1,3,5-Trimethylbenzene	< 0.20 U	9.96	10.0	99.6%	9.99	10.0	99.9%	0.3%
1,2,4-Trimethylbenzene	< 0.20 U	9.99	10.0	99.9%	10.1	10.0	101%	1.1%
Hexachlorobutadiene	< 0.50 U	9.05	10.0	90.5%	9.13	10.0	91.3%	0.9%
1,2-Dibromoethane	< 0.20 U	9.66	10.0	96.6%	9.99	10.0	99.9%	3.4%
Bromochloromethane	< 0.20 U	9.62	10.0	96.2%	9.84	10.0	98.4%	2.3%
2,2-Dichloropropane	< 0.20 U	8.15	10.0	81.5%	8.56	10.0	85.6%	4.9%
1,3-Dichloropropane	< 0.20 U	9.46	10.0	94.6%	9.57	10.0	95.7%	1.2%
Isopropylbenzene	< 0.20 U	9.72	10.0	97.2%	9.73	10.0	97.3%	0.1%
n-Propylbenzene	< 0.20 U	9.85	10.0	98.5%	9.88	10.0	98.8%	0.3%
Bromobenzene	< 0.20 U	9.41	10.0	94.1%	9.59	10.0	95.9%	1.9%
2-Chlorotoluene	< 0.20 U	9.41	10.0	94.1%	9.45	10.0	94.5%	0.4%
4-Chlorotoluene	< 0.20 U	9.31	10.0	93.1%	9.40	10.0	94.0%	1.0%
tert-Butylbenzene	< 0.20 U	9.84	10.0	98.4%	9.79	10.0	97.9%	0.5%
sec-Butylbenzene	< 0.20 U	9.80	10.0	98.0%	9.95	10.0	99.5%	1.5%
4-Isopropyltoluene	< 0.20 U	10.0	10.0	100%	10.1	10.0	101%	1.0%
n-Butylbenzene	< 0.20 U	9.85	10.0	98.5%	9.94	10.0	99.4%	0.9%
1,2,4-Trichlorobenzene	< 0.50 U	9.53	10.0	95.3%	9.71	10.0	97.1%	1.9%
Naphthalene	< 0.50 U	10.0	10.0	100%	10.4	10.0	104%	3.9%
1,2,3-Trichlorobenzene	< 0.50 U	9.67	10.0	96.7%	9.76	10.0	97.6%	0.9%

Reported in µg/L (ppb)

NA-No recovery due to high concentration of analyte in original sample, calculated negative recovery, or undetected spike.

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
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Sample ID: RGW263-041916  
MATRIX SPIKE

Lab Sample ID: AZK1B  
LIMS ID: 16-6147  
Matrix: Water  
Data Release Authorized:  
Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure  
Project: Boeng Apron A Additional Sampling  
88880100  
Date Sampled: 04/19/16  
Date Received: 04/19/16

Instrument/Analyst: NT2/PKC  
Date Analyzed: 04/22/16 18:30

Sample Amount: 10.0 mL  
Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	---	
74-83-9	Bromomethane	1.0	---	
75-01-4	Vinyl Chloride	0.20	---	
75-00-3	Chloroethane	0.20	---	
75-09-2	Methylene Chloride	1.0	---	
67-64-1	Acetone	5.0	---	
75-15-0	Carbon Disulfide	0.20	---	
75-35-4	1,1-Dichloroethene	0.20	---	
75-34-3	1,1-Dichloroethane	0.20	---	
156-60-5	trans-1,2-Dichloroethene	0.20	---	
156-59-2	cis-1,2-Dichloroethene	0.20	---	
67-66-3	Chloroform	0.20	---	
107-06-2	1,2-Dichloroethane	0.20	---	
78-93-3	2-Butanone	5.0	---	
71-55-6	1,1,1-Trichloroethane	0.20	---	
56-23-5	Carbon Tetrachloride	0.20	---	
108-05-4	Vinyl Acetate	0.20	---	
75-27-4	Bromodichloromethane	0.20	---	
78-87-5	1,2-Dichloropropane	0.20	---	
10061-01-5	cis-1,3-Dichloropropene	0.20	---	
79-01-6	Trichloroethene	0.20	---	
124-48-1	Dibromochloromethane	0.20	---	
79-00-5	1,1,2-Trichloroethane	0.20	---	
71-43-2	Benzene	0.20	---	
10061-02-6	trans-1,3-Dichloropropene	0.20	---	
110-75-8	2-Chloroethylvinylether	1.0	---	
75-25-2	Bromoform	0.20	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	---	
591-78-6	2-Hexanone	5.0	---	
127-18-4	Tetrachloroethene	0.20	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.20	---	
108-88-3	Toluene	0.20	---	
108-90-7	Chlorobenzene	0.20	---	
100-41-4	Ethylbenzene	0.20	---	
100-42-5	Styrene	0.20	---	
75-69-4	Trichlorofluoromethane	0.20	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	---	
179601-23-1	m,p-Xylene	0.40	---	
95-47-6	o-Xylene	0.20	---	
95-50-1	1,2-Dichlorobenzene	0.20	---	
541-73-1	1,3-Dichlorobenzene	0.20	---	
106-46-7	1,4-Dichlorobenzene	0.20	---	

Lab Sample ID: AZK1B  
LIMS ID: 16-6147  
Matrix: Water  
Date Analyzed: 04/22/16 18:30

QC Report No: AZK1-AMEC Environment & Infrastructure  
Project: Boeng Apron A Additional Sampling  
88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	---	
74-88-4	Iodomethane	1.0	---	
74-96-4	Bromoethane	0.20	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.20	---	
74-95-3	Dibromomethane	0.20	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.20	---	
96-12-8	1,2-Dibromo-3-chloropropane	0.50	---	
96-18-4	1,2,3-Trichloropropane	0.50	---	
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.20	---	
95-63-6	1,2,4-Trimethylbenzene	0.20	---	
87-68-3	Hexachlorobutadiene	0.50	---	
106-93-4	1,2-Dibromoethane	0.20	---	
74-97-5	Bromochloromethane	0.20	---	
594-20-7	2,2-Dichloropropane	0.20	---	
142-28-9	1,3-Dichloropropane	0.20	---	
98-82-8	Isopropylbenzene	0.20	---	
103-65-1	n-Propylbenzene	0.20	---	
108-86-1	Bromobenzene	0.20	---	
95-49-8	2-Chlorotoluene	0.20	---	
106-43-4	4-Chlorotoluene	0.20	---	
98-06-6	tert-Butylbenzene	0.20	---	
135-98-8	sec-Butylbenzene	0.20	---	
99-87-6	4-Isopropyltoluene	0.20	---	
104-51-8	n-Butylbenzene	0.20	---	
120-82-1	1,2,4-Trichlorobenzene	0.50	---	
91-20-3	Naphthalene	0.50	---	
87-61-6	1,2,3-Trichlorobenzene	0.50	---	

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	101%
d8-Toluene	99.2%
Bromofluorobenzene	101%
d4-1,2-Dichlorobenzene	101%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

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Sample ID: RGW263-041916

MATRIX SPIKE DUP

Lab Sample ID: AZK1B

LIMS ID: 16-6147

Matrix: Water

Data Release Authorized:

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 18:51

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	---	
74-83-9	Bromomethane	1.0	---	
75-01-4	Vinyl Chloride	0.20	---	
75-00-3	Chloroethane	0.20	---	
75-09-2	Methylene Chloride	1.0	---	
67-64-1	Acetone	5.0	---	
75-15-0	Carbon Disulfide	0.20	---	
75-35-4	1,1-Dichloroethene	0.20	---	
75-34-3	1,1-Dichloroethane	0.20	---	
156-60-5	trans-1,2-Dichloroethene	0.20	---	
156-59-2	cis-1,2-Dichloroethene	0.20	---	
67-66-3	Chloroform	0.20	---	
107-06-2	1,2-Dichloroethane	0.20	---	
78-93-3	2-Butanone	5.0	---	
71-55-6	1,1,1-Trichloroethane	0.20	---	
56-23-5	Carbon Tetrachloride	0.20	---	
108-05-4	Vinyl Acetate	0.20	---	
75-27-4	Bromodichloromethane	0.20	---	
78-87-5	1,2-Dichloropropane	0.20	---	
10061-01-5	cis-1,3-Dichloropropene	0.20	---	
79-01-6	Trichloroethene	0.20	---	
124-48-1	Dibromochloromethane	0.20	---	
79-00-5	1,1,2-Trichloroethane	0.20	---	
71-43-2	Benzene	0.20	---	
10061-02-6	trans-1,3-Dichloropropene	0.20	---	
110-75-8	2-Chloroethylvinylether	1.0	---	
75-25-2	Bromoform	0.20	---	
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	---	
591-78-6	2-Hexanone	5.0	---	
127-18-4	Tetrachloroethene	0.20	---	
79-34-5	1,1,2,2-Tetrachloroethane	0.20	---	
108-88-3	Toluene	0.20	---	
108-90-7	Chlorobenzene	0.20	---	
100-41-4	Ethylbenzene	0.20	---	
100-42-5	Styrene	0.20	---	
75-69-4	Trichlorofluoromethane	0.20	---	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	---	
179601-23-1	m,p-Xylene	0.40	---	
95-47-6	o-Xylene	0.20	---	
95-50-1	1,2-Dichlorobenzene	0.20	---	
541-73-1	1,3-Dichlorobenzene	0.20	---	
106-46-7	1,4-Dichlorobenzene	0.20	---	

Lab Sample ID: AZK1B  
 LIMS ID: 16-6147  
 Matrix: Water  
 Date Analyzed: 04/22/16 18:51

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	---	
74-88-4	Iodomethane	1.0	---	
74-96-4	Bromoethane	0.20	---	
107-13-1	Acrylonitrile	1.0	---	
563-58-6	1,1-Dichloropropene	0.20	---	
74-95-3	Dibromomethane	0.20	---	
630-20-6	1,1,1,2-Tetrachloroethane	0.20	---	
96-12-8	1,2-Dibromo-3-chloropropane	0.50	---	
96-18-4	1,2,3-Trichloropropane	0.50	---	
110-57-6	trans-1,4-Dichloro-2-butene	1.0	---	
108-67-8	1,3,5-Trimethylbenzene	0.20	---	
95-63-6	1,2,4-Trimethylbenzene	0.20	---	
87-68-3	Hexachlorobutadiene	0.50	---	
106-93-4	1,2-Dibromoethane	0.20	---	
74-97-5	Bromochloromethane	0.20	---	
594-20-7	2,2-Dichloropropane	0.20	---	
142-28-9	1,3-Dichloropropane	0.20	---	
98-82-8	Isopropylbenzene	0.20	---	
103-65-1	n-Propylbenzene	0.20	---	
108-86-1	Bromobenzene	0.20	---	
95-49-8	2-Chlorotoluene	0.20	---	
106-43-4	4-Chlorotoluene	0.20	---	
98-06-6	tert-Butylbenzene	0.20	---	
135-98-8	sec-Butylbenzene	0.20	---	
99-87-6	4-Isopropyltoluene	0.20	---	
104-51-8	n-Butylbenzene	0.20	---	
120-82-1	1,2,4-Trichlorobenzene	0.50	---	
91-20-3	Naphthalene	0.50	---	
87-61-6	1,2,3-Trichlorobenzene	0.50	---	

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	102%
d8-Toluene	99.8%
Bromofluorobenzene	98.6%
d4-1,2-Dichlorobenzene	99.4%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
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Sample ID: LCS-042216A  
LAB CONTROL SAMPLE

Lab Sample ID: LCS-042216A  
LIMS ID: 16-6146  
Matrix: Water  
Data Release Authorized:  
Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure  
Project: Boeng Apron A Additional Sampling  
88880100  
Date Sampled: NA  
Date Received: NA

Instrument/Analyst LCS: NT2/PKC  
LCSD: NT2/PKC  
Date Analyzed LCS: 04/22/16 09:35  
LCSD: 04/22/16 09:56

Sample Amount LCS: 10.0 mL  
LCSD: 10.0 mL  
Purge Volume LCS: 10.0 mL  
LCSD: 10.0 mL

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	9.58	10.0	95.8%	10.1	10.0	101%	5.3%
Bromomethane	10.2	10.0	102%	10.7	10.0	107%	4.8%
Vinyl Chloride	9.32	10.0	93.2%	9.74	10.0	97.4%	4.4%
Chloroethane	10.7	10.0	107%	11.5	10.0	115%	7.2%
Methylene Chloride	9.03	10.0	90.3%	9.64	10.0	96.4%	6.5%
Acetone	43.3	50.0	86.6%	47.5	50.0	95.0%	9.3%
Carbon Disulfide	8.86	10.0	88.6%	9.53	10.0	95.3%	7.3%
1,1-Dichloroethene	9.26	10.0	92.6%	9.76	10.0	97.6%	5.3%
1,1-Dichloroethane	9.63	10.0	96.3%	10.3	10.0	103%	6.7%
trans-1,2-Dichloroethene	9.01	10.0	90.1%	9.67	10.0	96.7%	7.1%
cis-1,2-Dichloroethene	9.67	10.0	96.7%	10.4	10.0	104%	7.3%
Chloroform	9.53	10.0	95.3%	10.3	10.0	103%	7.8%
1,2-Dichloroethane	9.50	10.0	95.0%	10.4	10.0	104%	9.0%
2-Butanone	45.1	50.0	90.2%	50.2	50.0	100%	10.7%
1,1,1-Trichloroethane	9.38	10.0	93.8%	10.2	10.0	102%	8.4%
Carbon Tetrachloride	7.12	10.0	71.2%	7.89	10.0	78.9%	10.3%
Vinyl Acetate	7.81	10.0	78.1%	8.63	10.0	86.3%	10.0%
Bromodichloromethane	9.50	10.0	95.0%	10.3	10.0	103%	8.1%
1,2-Dichloropropane	9.51	10.0	95.1%	10.5	10.0	105%	9.9%
cis-1,3-Dichloropropene	9.92	10.0	99.2%	10.7	10.0	107%	7.6%
Trichloroethene	9.81	10.0	98.1%	10.6	10.0	106%	7.7%
Dibromochloromethane	7.20 Q	10.0	72.0%	8.02 Q	10.0	80.2%	10.8%
1,1,2-Trichloroethane	9.95	10.0	99.5%	10.9	10.0	109%	9.1%
Benzene	9.91	10.0	99.1%	10.7	10.0	107%	7.7%
trans-1,3-Dichloropropene	7.79	10.0	77.9%	8.77	10.0	87.7%	11.8%
2-Chloroethylvinylether	9.65	10.0	96.5%	10.5	10.0	105%	8.4%
Bromoform	6.26 Q	10.0	62.6%	7.27 Q	10.0	72.7%	14.9%
4-Methyl-2-Pentanone (MIBK)	47.2	50.0	94.4%	52.6	50.0	105%	10.8%
2-Hexanone	46.6	50.0	93.2%	52.3	50.0	105%	11.5%
Tetrachloroethene	9.67	10.0	96.7%	10.6	10.0	106%	9.2%
1,1,2,2-Tetrachloroethane	9.68	10.0	96.8%	10.8	10.0	108%	10.9%
Toluene	9.63	10.0	96.3%	10.4	10.0	104%	7.7%
Chlorobenzene	9.82	10.0	98.2%	10.6	10.0	106%	7.6%
Ethylbenzene	9.69	10.0	96.9%	10.6	10.0	106%	9.0%
Styrene	10.5	10.0	105%	11.4	10.0	114%	8.2%
Trichlorofluoromethane	9.31	10.0	93.1%	9.93	10.0	99.3%	6.4%
1,1,2-Trichloro-1,2,2-trifluoroethane	8.94	10.0	89.4%	9.65	10.0	96.5%	7.6%
m,p-Xylene	20.4	20.0	102%	22.2	20.0	111%	8.5%

ORGANICS ANALYSIS DATA SHEET  
Volatiles by P&T GC/MS-Method SW8260C  
Page 2 of 2

Sample ID: LCS-042216A  
LAB CONTROL SAMPLE

Lab Sample ID: LCS-042216A  
LIMS ID: 16-6146  
Matrix: Water

QC Report No: AZK1-AMEC Environment & Infrastructure  
Project: Boeng Apron A Additional Sampling  
88880100

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	10.1	10.0	101%	11.0	10.0	110%	8.5%
1,2-Dichlorobenzene	9.84	10.0	98.4%	10.8	10.0	108%	9.3%
1,3-Dichlorobenzene	9.85	10.0	98.5%	10.8	10.0	108%	9.2%
1,4-Dichlorobenzene	9.31	10.0	93.1%	10.1	10.0	101%	8.1%
Acrolein	42.5	50.0	85.0%	46.9	50.0	93.8%	9.8%
Iodomethane	10.3	10.0	103%	11.5	10.0	115%	11.0%
Bromoethane	9.36	10.0	93.6%	9.69	10.0	96.9%	3.5%
Acrylonitrile	9.79	10.0	97.9%	10.5	10.0	105%	7.0%
1,1-Dichloropropene	9.79	10.0	97.9%	10.4	10.0	104%	6.0%
Dibromomethane	9.55	10.0	95.5%	10.5	10.0	105%	9.5%
1,1,1,2-Tetrachloroethane	9.66	10.0	96.6%	10.6	10.0	106%	9.3%
1,2-Dibromo-3-chloropropane	6.77 Q	10.0	67.7%	7.75 Q	10.0	77.5%	13.5%
1,2,3-Trichloropropane	9.99	10.0	99.9%	11.2	10.0	112%	11.4%
trans-1,4-Dichloro-2-butene	8.79	10.0	87.9%	10.0	10.0	100%	12.9%
1,3,5-Trimethylbenzene	10.4	10.0	104%	11.5	10.0	115%	10.0%
1,2,4-Trimethylbenzene	10.5	10.0	105%	11.4	10.0	114%	8.2%
Hexachlorobutadiene	9.17	10.0	91.7%	10.5	10.0	105%	13.5%
1,2-Dibromoethane	10.2	10.0	102%	11.0	10.0	110%	7.5%
Bromochloromethane	9.98	10.0	99.8%	10.8	10.0	108%	7.9%
2,2-Dichloropropane	9.34	10.0	93.4%	9.91	10.0	99.1%	5.9%
1,3-Dichloropropane	9.95	10.0	99.5%	10.8	10.0	108%	8.2%
Isopropylbenzene	10.3	10.0	103%	11.2	10.0	112%	8.4%
n-Propylbenzene	10.3	10.0	103%	11.2	10.0	112%	8.4%
Bromobenzene	9.88	10.0	98.8%	10.8	10.0	108%	8.9%
2-Chlorotoluene	9.88	10.0	98.8%	10.8	10.0	108%	8.9%
4-Chlorotoluene	9.83	10.0	98.3%	10.7	10.0	107%	8.5%
tert-Butylbenzene	10.4	10.0	104%	11.4	10.0	114%	9.2%
sec-Butylbenzene	10.4	10.0	104%	11.4	10.0	114%	9.2%
4-Isopropyltoluene	10.5	10.0	105%	11.6	10.0	116%	10.0%
n-Butylbenzene	10.1	10.0	101%	11.3	10.0	113%	11.2%
1,2,4-Trichlorobenzene	9.66	10.0	96.6%	10.7	10.0	107%	10.2%
Naphthalene	10.1	10.0	101%	11.3	10.0	113%	11.2%
1,2,3-Trichlorobenzene	9.88	10.0	98.8%	10.9	10.0	109%	9.8%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSD
d4-1,2-Dichloroethane	96.2%	95.0%
d8-Toluene	99.2%	99.6%
Bromofluorobenzene	97.4%	101%
d4-1,2-Dichlorobenzene	100%	102%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by P&T GC/MS-Method SW8260C

Page 1 of 2

Sample ID: MB-042216A

METHOD BLANK

Lab Sample ID: MB-042216A

LIMS ID: 16-6146

Matrix: Water

Data Release Authorized: *RB*

Reported: 04/25/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: NA

Date Received: NA

Instrument/Analyst: NT2/PKC

Date Analyzed: 04/22/16 10:39

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	LOQ	Result	Q
74-87-3	Chloromethane	0.50	< 0.50	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.20	< 0.20	U
75-00-3	Chloroethane	0.20	< 0.20	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.20	< 0.20	U
75-35-4	1,1-Dichloroethene	0.20	< 0.20	U
75-34-3	1,1-Dichloroethane	0.20	< 0.20	U
156-60-5	trans-1,2-Dichloroethene	0.20	< 0.20	U
156-59-2	cis-1,2-Dichloroethene	0.20	< 0.20	U
67-66-3	Chloroform	0.20	< 0.20	U
107-06-2	1,2-Dichloroethane	0.20	< 0.20	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.20	< 0.20	U
56-23-5	Carbon Tetrachloride	0.20	< 0.20	U
108-05-4	Vinyl Acetate	0.20	< 0.20	U
75-27-4	Bromodichloromethane	0.20	< 0.20	U
78-87-5	1,2-Dichloropropane	0.20	< 0.20	U
10061-01-5	cis-1,3-Dichloropropene	0.20	< 0.20	U
79-01-6	Trichloroethene	0.20	< 0.20	U
124-48-1	Dibromochloromethane	0.20	< 0.20	U
79-00-5	1,1,2-Trichloroethane	0.20	< 0.20	U
71-43-2	Benzene	0.20	< 0.20	U
10061-02-6	trans-1,3-Dichloropropene	0.20	< 0.20	U
110-75-8	2-Chloroethylvinylether	1.0	< 1.0	U
75-25-2	Bromoform	0.20	< 0.20	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	5.0	< 5.0	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.20	< 0.20	U
79-34-5	1,1,2,2-Tetrachloroethane	0.20	< 0.20	U
108-88-3	Toluene	0.20	< 0.20	U
108-90-7	Chlorobenzene	0.20	< 0.20	U
100-41-4	Ethylbenzene	0.20	< 0.20	U
100-42-5	Styrene	0.20	< 0.20	U
75-69-4	Trichlorofluoromethane	0.20	< 0.20	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.20	< 0.20	U
179601-23-1	m,p-Xylene	0.40	< 0.40	U
95-47-6	o-Xylene	0.20	< 0.20	U
95-50-1	1,2-Dichlorobenzene	0.20	< 0.20	U
541-73-1	1,3-Dichlorobenzene	0.20	< 0.20	U
106-46-7	1,4-Dichlorobenzene	0.20	< 0.20	U

Lab Sample ID: MB-042216A  
 LIMS ID: 16-6146  
 Matrix: Water  
 Date Analyzed: 04/22/16 10:39

QC Report No: AZK1-AMEC Environment & Infrastructure  
 Project: Boeng Apron A Additional Sampling  
 88880100

CAS Number	Analyte	LOQ	Result	Q
107-02-8	Acrolein	5.0	< 5.0	U
74-88-4	Iodomethane	1.0	< 1.0	U
74-96-4	Bromoethane	0.20	< 0.20	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.20	< 0.20	U
74-95-3	Dibromomethane	0.20	< 0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	0.20	< 0.20	U
96-12-8	1,2-Dibromo-3-chloropropane	0.50	< 0.50	U
96-18-4	1,2,3-Trichloropropane	0.50	< 0.50	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.20	< 0.20	U
95-63-6	1,2,4-Trimethylbenzene	0.20	< 0.20	U
87-68-3	Hexachlorobutadiene	0.50	< 0.50	U
106-93-4	1,2-Dibromoethane	0.20	< 0.20	U
74-97-5	Bromochloromethane	0.20	< 0.20	U
594-20-7	2,2-Dichloropropane	0.20	< 0.20	U
142-28-9	1,3-Dichloropropane	0.20	< 0.20	U
98-82-8	Isopropylbenzene	0.20	< 0.20	U
103-65-1	n-Propylbenzene	0.20	< 0.20	U
108-86-1	Bromobenzene	0.20	< 0.20	U
95-49-8	2-Chlorotoluene	0.20	< 0.20	U
106-43-4	4-Chlorotoluene	0.20	< 0.20	U
98-06-6	tert-Butylbenzene	0.20	< 0.20	U
135-98-8	sec-Butylbenzene	0.20	< 0.20	U
99-87-6	4-Isopropyltoluene	0.20	< 0.20	U
104-51-8	n-Butylbenzene	0.20	< 0.20	U
120-82-1	1,2,4-Trichlorobenzene	0.50	< 0.50	U
91-20-3	Naphthalene	0.50	< 0.50	U
87-61-6	1,2,3-Trichlorobenzene	0.50	< 0.50	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	100%
d8-Toluene	100%
Bromofluorobenzene	92.8%
d4-1,2-Dichlorobenzene	104%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW265-041916  
Page 1 of 1 SAMPLE

Lab Sample ID: AZK1A

QC Report No: AZK1-AMEC Environment & Infrastructure

LIMS ID: 16-6146

Project: Boeng Apron A Additional Sampling

Matrix: Water

88880100

Data Release Authorized:

Date Sampled: 04/19/16

Reported: 05/02/16

Date Received: 04/19/16

Instrument/Analyst: NT15/PAB

Sample Amount: 10.0 mL

Date Analyzed: 04/22/16 12:34

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	0.42	
75-35-4	1,1-Dichloroethene	0.020	< 0.020	U
156-59-2	cis-1,2-Dichloroethene	0.020	0.28	
79-01-6	Trichloroethene	0.020	< 0.020	U
127-18-4	Tetrachloroethene	0.020	< 0.020	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 103%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW263-041916  
Page 1 of 1 SAMPLE

Lab Sample ID: AZK1B

LIMS ID: 16-6147

Matrix: Water

Data Release Authorized:

Reported: 05/02/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT15/PAB

Date Analyzed: 04/22/16 12:59

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	1.3	
75-35-4	1,1-Dichloroethene	0.020	< 0.020	U
156-59-2	cis-1,2-Dichloroethene	0.020	0.19	
79-01-6	Trichloroethene	0.020	< 0.020	U
127-18-4	Tetrachloroethene	0.020	< 0.020	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 102%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW263-041916  
Page 1 of 1 MATRIX SPIKE

Lab Sample ID: AZK1B

LIMS ID: 16-6147

Matrix: Water

Data Release Authorized:

Reported: 05/02/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT15/PAB

Date Analyzed: 04/22/16 13:24

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	---	
75-35-4	1,1-Dichloroethene	0.020	---	
156-59-2	cis-1,2-Dichloroethene	0.020	---	
79-01-6	Trichloroethene	0.020	---	
127-18-4	Tetrachloroethene	0.020	---	

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 95.7%

**ORGANICS ANALYSIS DATA SHEET**

**Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW263-041916**  
 Page 1 of 1 **MATRIX SPIKE DUP**

Lab Sample ID: AZK1B	QC Report No: AZK1-AMEC Environment & Infrastructure
LIMS ID: 16-6147	Project: Boeng Apron A Additional Sampling
Matrix: Water	88880100
Data Release Authorized:	Date Sampled: 04/19/16
Reported: 05/02/16	Date Received: 04/19/16
Instrument/Analyst: NT15/PAB	Sample Amount: 10.0 mL
Date Analyzed: 04/22/16 13:50	Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	---	
75-35-4	1,1-Dichloroethene	0.020	---	
156-59-2	cis-1,2-Dichloroethene	0.020	---	
79-01-6	Trichloroethene	0.020	---	
127-18-4	Tetrachloroethene	0.020	---	

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane	105%
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**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW264-041916  
Page 1 of 1 SAMPLE

Lab Sample ID: AZK1C

QC Report No: AZK1-AMEC Environment & Infrastructure

LIMS ID: 16-6148

Project: Boeng Apron A Additional Sampling

Matrix: Water

88880100

Data Release Authorized:

Date Sampled: 04/19/16

Reported: 05/02/16

Date Received: 04/19/16

Instrument/Analyst: NT15/PAB

Sample Amount: 10.0 mL

Date Analyzed: 04/22/16 14:15

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	8.7	
75-35-4	1,1-Dichloroethene	0.020	< 0.020	U
156-59-2	cis-1,2-Dichloroethene	0.020	0.062	
79-01-6	Trichloroethene	0.020	< 0.020	U
127-18-4	Tetrachloroethene	0.020	< 0.020	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 105%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW262-041916  
Page 1 of 1 SAMPLE

Lab Sample ID: AZK1D

QC Report No: AZK1-AMEC Environment & Infrastructure

LIMS ID: 16-6149

Project: Boeng Apron A Additional Sampling

Matrix: Water

88880100

Data Release Authorized:

Date Sampled: 04/19/16

Reported: 05/02/16

Date Received: 04/19/16

Instrument/Analyst: NT15/PAB

Sample Amount: 10.0 mL

Date Analyzed: 04/22/16 14:40

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	1.7	
75-35-4	1,1-Dichloroethene	0.020	< 0.020	U
156-59-2	cis-1,2-Dichloroethene	0.020	0.044	
79-01-6	Trichloroethene	0.020	< 0.020	U
127-18-4	Tetrachloroethene	0.020	< 0.020	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 104%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: Dup-01-041916  
Page 1 of 1 SAMPLE

Lab Sample ID: AZK1E

LIMS ID: 16-6150

Matrix: Water

Data Release Authorized:

Reported: 05/02/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: 04/19/16

Date Received: 04/19/16

Instrument/Analyst: NT15/PAB

Date Analyzed: 04/22/16 15:05

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	0.44	
75-35-4	1,1-Dichloroethene	0.020	< 0.020	U
156-59-2	cis-1,2-Dichloroethene	0.020	0.31	
79-01-6	Trichloroethene	0.020	< 0.020	U
127-18-4	Tetrachloroethene	0.020	< 0.020	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 108%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: LCS-042216

Page 1 of 1

LAB CONTROL SAMPLE

Lab Sample ID: LCS-042216

QC Report No: AZK1-AMEC Environment & Infrastructure

LIMS ID: 16-6146

Project: Boeng Apron A Additional Sampling

Matrix: Water

88880100

Data Release Authorized:

Date Sampled: NA

Reported: 05/02/16

Date Received: NA

Instrument/Analyst LCS: NT15/PAB

Sample Amount LCS: 10.0 mL

LCSID: NT15/PAB

LCSID: 10.0 mL

Date Analyzed LCS: 04/22/16 11:06

Purge Volume LCS: 10.0 mL

LCSID: 04/22/16 11:32

LCSID: 10.0 mL

Analyte	LCS	Spike	LCS	LCSID	Spike	LCSID	RPD
		Added-LCS	Recovery		Added-LCSID	Recovery	
Vinyl Chloride	0.916	1.00	91.6%	1.02	1.00	102%	10.7%
1,1-Dichloroethene	0.841	1.00	84.1%	1.02	1.00	102%	19.2%
cis-1,2-Dichloroethene	0.961	1.00	96.1%	1.10	1.00	110%	13.5%
Trichloroethene	0.970	1.00	97.0%	1.08	1.00	108%	10.7%
Tetrachloroethene	1.03	1.00	103%	1.16	1.00	116%	11.9%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

**Volatile Surrogate Recovery**

	LCS	LCSID
d4-1,2-Dichloroethane	91.7%	96.6%

**ORGANICS ANALYSIS DATA SHEET**

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: RGW263-041916  
Page 1 of 1 MATRIX SPIKE

Lab Sample ID: AZK1B  
LIMS ID: 16-6147  
Matrix: Water  
Data Release Authorized:  
Reported: 05/02/16

QC Report No: AZK1-AMEC Environment & Infrastructure  
Project: Boeng Apron A Additional Sampling  
88880100  
Date Sampled: 04/19/16  
Date Received: 04/19/16

Instrument/Analyst MS: NT15/PAB  
MSD: NT15/PAB  
Date Analyzed MS: 04/22/16 13:24  
MSD: 04/22/16 13:50

Sample Amount MS: 10.0 mL  
MSD: 10.0 mL  
Purge Volume MS: 10.0 mL  
MSD: 10.0 mL

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Vinyl Chloride	1.33	2.42	1.00	109%	2.30	1.00	97.0%	5.1%
1,1-Dichloroethene	< 0.020 U	1.41	1.00	141%	1.39	1.00	139%	1.4%
cis-1,2-Dichloroethene	0.190	1.35	1.00	116%	1.33	1.00	114%	1.5%
Trichloroethene	< 0.020 U	1.08	1.00	108%	1.06	1.00	106%	1.9%
Tetrachloroethene	< 0.020 U	1.18	1.00	118%	1.14	1.00	114%	3.4%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET

Volatiles by Purge & Trap GC/MS-Method SW8260C-SIM Sample ID: MB-042216

Page 1 of 1

METHOD BLANK

Lab Sample ID: MB-042216

LIMS ID: 16-6146

Matrix: Water

Data Release Authorized:

Reported: 05/02/16

QC Report No: AZK1-AMEC Environment & Infrastructure

Project: Boeng Apron A Additional Sampling

88880100

Date Sampled: NA

Date Received: NA

Instrument/Analyst: NT15/PAB

Date Analyzed: 04/22/16 11:57

Sample Amount: 10.0 mL

Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	0.020	< 0.020	U
75-35-4	1,1-Dichloroethene	0.020	< 0.020	U
156-59-2	cis-1,2-Dichloroethene	0.020	< 0.020	U
79-01-6	Trichloroethene	0.020	< 0.020	U
127-18-4	Tetrachloroethene	0.020	< 0.020	U

Reported in µg/L (ppb)

**Volatile Surrogate Recovery**

d4-1,2-Dichloroethane 107%



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**APPENDIX C**

Groundwater Monitoring Well Boring Logs

PROJECT: Boeing Apron A Apron A at the Renton Municipal Airport		<b>Log of Well No. GW-262S</b>	
BORING LOCATION: Apron A		GROUND SURFACE ELEVATION AND DATUM: Ground Surface	
DRILLING CONTRACTOR: Cascade Drilling, Inc.		DATE STARTED: 4/14/16	DATE FINISHED: 4/14/16
DRILLING METHOD: Direct push		TOTAL DEPTH (ft.): 18.0	SCREEN INTERVAL (ft.): 8-18
DRILLING EQUIPMENT: Geoprobe 6600		DEPTH TO WATER: 8	FIRST COMPL. 6.90 CASING: 2" sched. 40 PVC
SAMPLING METHOD: Geoprobe macro-core sampler [2' x 1.5"]		LOGGED BY: J. Bellamy	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: J. Bellamy	REG. NO. 3003

DEPTH (feet)	SAMPLES				OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.  Surface Elevation:	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ Foot				
0						ASPHALT.	Traffic Box
1						POORLY-GRADED SAND with GRAVEL (SP): Vactored down to 8 feet bgs.	
2							Hydrated Bentonite Chips 2" Diameter Schedule 40 PVC
3							
4							3.75" Borehole Diameter
5							
6							Filter Sand Prepacked Well Screen
7							
8	SB-GW262-00080				0 ppm	SILT (ML): dark gray (10YR 4/1), wet, 100% fines, low plasticity, trace organic matter (roots).	
9							
10					0 ppm		
11							
12						SILT (ML): dark gray (10YR 4/1), moist, 100% fines, intermixed with very dark grayish brown SILT (ML) with organic matter (roots).	
13	SB-GW262-00150				0 ppm		
14							
15							
16						SILT (ML): very dark brown (10YR 2/2), moist, 100% fines, intermixed with dark yellowish brown PEAT and wood chips.	
17							
18						SILT (ML): dark gray (10YR 4/1), moist, 100% fines.	
19						Bottom of Boring at 18 feet bgs.	
20							

PROJECT: Boeing Apron A Apron A at the Renton Municipal Airport		<b>Log of Well No. GW-263S</b>	
BORING LOCATION: Apron A		GROUND SURFACE ELEVATION AND DATUM: Ground Surface	
DRILLING CONTRACTOR: Cascade Drilling, Inc.		DATE STARTED: 4/14/16	DATE FINISHED: 4/14/16
DRILLING METHOD: Direct push		TOTAL DEPTH (ft.): 18.0	SCREEN INTERVAL (ft.): 8-18
DRILLING EQUIPMENT: Geoprobe 6600		DEPTH TO FIRST WATER: 6	COMPL. 3.89
SAMPLING METHOD: Geoprobe macro-core sampler [2' x 1.5"]		LOGGED BY: J. Bellamy	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: J. Bellamy	REG. NO. 3003

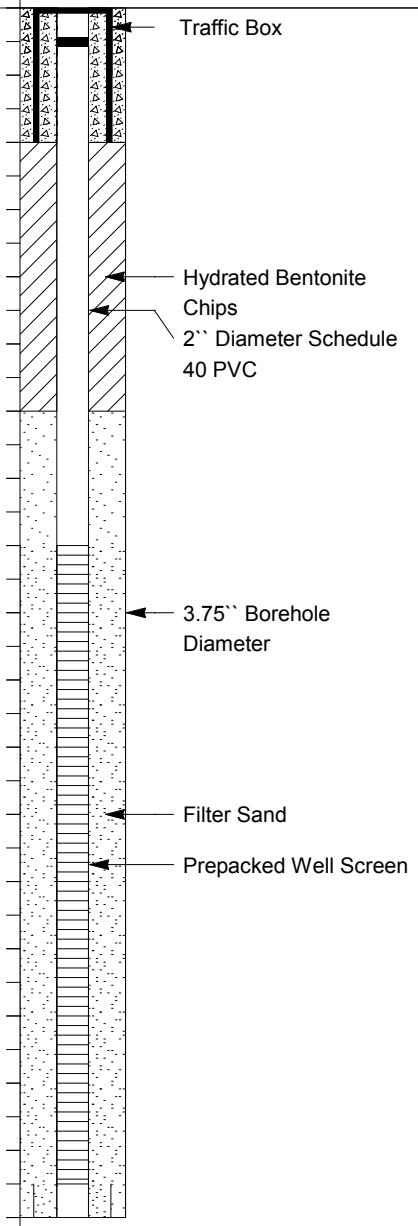
DEPTH (feet)	SAMPLES			OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ Foot			
0					CONCRETE.	
1						Traffic Box
2					POORLY-GRADED SAND with GRAVEL (SP): brown Vactored down to 6 feet bgs.	
3						
4						Hydrated Bentonite Chips
5						2" Diameter Schedule 40 PVC
6					SILT (ML): dark gray (10YR 4/1), wet, 100% fines, low plasticity. organic matter (roots).	
7						
8				0 ppm	SILTY SAND (SM): dark gray (10YR 4/1), wet, 60% fines, 40% medium to fine sands.	
9					SILT (ML): dark gray (10YR 4/1), wet, 100% fines, low plasticity, with organic matter.	3.75" Borehole Diameter
10						
11				0 ppm	POORLY-GRADED SAND (SP): black (10YR 2/1), wet, 100% medium sands.	
12					SILT (ML): dark gray (10YR 4/1), wet, 100% fines with organic matter.	Filter Sand
13						Prepacked Well Screen
14				0 ppm	SILT (ML): dark brown (10YR 3/3), wet, 100% fines with organic matter.	
15					POORLY-GRADED SAND (SM): lens SILT (ML): dark brown (10YR 3/3), wet, 100% fines with organic matter and red-brown PEAT.	
16					SILT (ML): dark gray (10YR 4/1), wet, 100% fines, with organic matter (grass,wood).	
17						
18					SAA with intermixed with PEAT Bottom of Boring at 18 feet bgs.	
19						
20						

PROJECT: Boeing Apron A Apron A at the Renton Municipal Airport		<b>Log of Well No. GW-264S</b>	
BORING LOCATION: Apron A		GROUND SURFACE ELEVATION AND DATUM: Ground Surface	
DRILLING CONTRACTOR: Cascade Drilling, Inc.		DATE STARTED: 4/14/16	DATE FINISHED: 4/14/16
DRILLING METHOD: Direct push		TOTAL DEPTH (ft.): 18.0	SCREEN INTERVAL (ft.): 8-18
DRILLING EQUIPMENT: Geoprobe 6600		DEPTH TO WATER: 6.1	COMPL. 3.99
SAMPLING METHOD: Geoprobe macro-core sampler [2' x 1.5"]		LOGGED BY: J. Bellamy	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: J. Bellamy	REG. NO. 3003

DEPTH (feet)	SAMPLES			OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ Foot			
0					CONCRETE.	
1					POORLY-GRADED SAND with SILT and GRAVEL (SP): brown Vactored down to 6.5 feet bgs.	
2						
3						
4						
5					SILT (ML): very dark brown moist, 100% fines, with organic matter	
6				0.7 ppm	SILT (ML): very dark gray (10YR 3/1), wet, 100% fines, low plasticity, organic matter (roots), organic odor.	
7				5.3 ppm		
8				19.8 ppm		
9						
10				0 ppm		
11						
12				0.6 ppm		
13					SILT (ML): very dark brown (10YR 2/2), wet, 95% fines and 5% fine sands, no plasticity, with trace sands and organic matter.	
14						
15				0 ppm	SILT (ML): very dark grayish brown (10YR 3/2), wet, 95% fines, 5% fine sands, no plasticity, with intermixed red-brown PEAT and wood debris.	
16					No Logging.	
17						
18					Bottom of Boring at 18 feet bgs.	
19						
20						

SB-GW264-00070

SB-GW264-00150



PROJECT: Boeing Apron A Apron A at the Renton Municipal Airport		<b>Log of Well No. GW-265S</b>	
BORING LOCATION: Apron A		GROUND SURFACE ELEVATION AND DATUM: Ground Surface	
DRILLING CONTRACTOR: Cascade Drilling, Inc.		DATE STARTED: 4/14/16	DATE FINISHED: 4/14/16
DRILLING METHOD: Direct push		TOTAL DEPTH (ft.): 18.0	SCREEN INTERVAL (ft.): 8-18
DRILLING EQUIPMENT: Geoprobe 6600		DEPTH TO FIRST WATER: 7	COMPL. 3.85
SAMPLING METHOD: Geoprobe macro-core sampler [2' x 1.5"]		LOGGED BY: J. Bellamy	
HAMMER WEIGHT: N/A	DROP: N/A	RESPONSIBLE PROFESSIONAL: J. Bellamy	REG. NO. 3003

DEPTH (feet)	SAMPLES				OVM Reading	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ Foot	Foot			
0						CONCRETE.	Traffic Box
1						POORLY-GRADED SAND with SILT and GRAVEL (SP): FILL, Vactored down to 7 feet bgs.	Hydrated Bentonite Chips 2" Diameter Schedule 40 PVC
2							
3						SILT (ML): dark gray (10YR 4/1), wet, 100% fines, low plasticity, intermixed with dark brown SILT and organic matter.	3.75" Borehole Diameter
4							
5					0 ppm	SILT (ML): very dark gray (10YR 3/1), wet, 100% fines, low plasticity, with organic matter.	Filter Sand
6							
7						POORLY-GRADED SAND (SP): black (10YR 2/1), wet, 100% medium sands.	Prepacked Well Screen
8							
9					0 ppm	SAA with mixed Red-Brown PEAT	
10							
11						SILT (ML): dark brown (10YR 3/3), wet, 95% fines, 5% fine sands, low plasticity, with organic matter intermixed with sand.	
12							
13						SAA but color changes to dark yellowish brown (10YR 3/6).	
14							
15					0 ppm	Bottom of Boring at 18 feet bgs.	
16							
17							
18							
19							
20							