

Memo

To: Byung Maeng, Ecology
Carl Bach, Boeing
Project: 0088880070.0010

From: Dave Haddock
cc: Ray Power, Boeing
Ryan Zulauf
Project File

Tel: (206) 342-1760

Fax: (206) 342-1761

Date: May 19, 2010

Subject: C-2 Transformer Characterization Results
Renton Municipal Airport
Renton, Washington

1.0 INTRODUCTION

This memorandum summarizes polychlorinated biphenyl (PCB) characterization work conducted at the C-2 transformer pad (see Figure 1) at the Renton Municipal Airport (Airport) in Renton, Washington. The Boeing Company (Boeing) is currently leasing a small parcel from the City of Renton. A small concrete pad housing three electrical transformers is located on this parcel. This transformer pad (the C-2 transformer pad) is located along the western margin of the airport. The PCB characterization work was completed in accordance with the C-2 Transformer Pad PCB Characterization Work Plan (AMEC, 2010). Analytical results from soil samples collected around the margin of this transformer pad in 2004 and 2005 indicate detectable concentrations of PCBs, but none of the detected concentrations exceeded regulatory cleanup levels. Boeing is planning to remove and dispose of the transformers and wooden platform, terminate the lease, and return the leased property to the City of Renton. The objective of the PCB characterization work was to determine potential impact to the soil, concrete pad, and wooden platform supporting the transformers, and to document conditions existing at the end of the lease. This was accomplished by collecting primary and composite samples for the four inference areas surrounding the C-2 transformer. Three media (soil, concrete, and wood) samples were collected from the sampling locations shown on Figure 2. The work plan was prepared and sampling activities were completed in accordance with the requirements of the Toxics Substances Control Act (TSCA), Code of Regulations (CFR) Title 40 (40 CFR) Part 261 concerning PCBs.

2.0 SITE BACKGROUND AND PREVIOUS INVESTIGATIONS

Soil samples were previously collected at the C-2 transformer pad area in June 2004 and July 2005. The analytical results for these samples are presented in Table 1 and were discussed in an earlier technical memorandum (Geomatrix, 2005). None of the previous soil samples collected from the C-2 transformer pad area exceeded 1 milligram per kilogram (mg/kg) of total PCBs. However, samples of the concrete pad or the wooden platform were not collected nor analyzed.

The objective of the characterization was to determine whether PCBs are present in the soil, concrete transformer pad, or wooden platform at concentrations greater than regulatory criteria.

3.0 SAMPLING AND ANALYSIS

This section describes the approach that was used to complete the sampling and analysis for characterization near the C-2 transformer pad. Figure 2 shows the area surrounding the C-2 transformer pad and the approximate sampling locations.

3.1 Cleanup Levels

As described in the work plan, 1 mg/kg is the total PCB cleanup level for the soil, concrete, and wood samples. These levels are in accordance with 40 CFR Part 761.61(4)(i); the PCB cleanup level for high-occupancy areas is 1 mg/kg as well as the Washington State Department of Ecology (Ecology) Model Toxics Control Act (MTCA) Method A unrestricted use soil cleanup level.

3.2 Sampling Approach and Methods

The sampling approach presented in the work plan was developed in accordance with TSCA guidance, and the area surrounding the C-2 transformer pad was subdivided into four separate inference areas: Inference Area 1 and Inference Area 2 comprise the area of soil surrounding the concrete pad; Inference Area 3 is the concrete pad; Inference Area 4 is the wooden platform. Each inference area is considered individually in evaluating the presence of PCBs.

The sampling design is based on a 3-meter grid around the transformer pad and a smaller 2.4-meter grid on the transformer pad, in order to achieve the minimum number of samples required. Samples were collected at the grid nodes as shown in Figure 2, and two samples were collected from each location. The grid spacing is based on the requirements of 40 CFR Parts 761.265, 761.283, and 761.286. One of the samples was archived and held for future analysis, pending initial analytical results. The other sample was added to a composite sample created from three to four individual samples (as specified in 40 CFR 261.289).

On April 7, 2010, AMEC Geomatrix, Inc. (AMEC), collected six shallow soil samples (C210-1-01 through C210-1-03, C210-1-04 through C210-1-06), four concrete samples (C210-3-07 through C210-3-10), and one wood sample (C210-4-11). Two composite soil samples (C210-1A-COMP, C210-2A-COMP), one composite concrete sample and duplicate concrete sample (C210-3A-COMP, C210-3-DUP) were collected from three inference areas. An additional wood sample (C210-4-12) was collected by AMEC on April 23, 2010, as requested by the analytical laboratory to provide additional sample mass/volume.

Soil samples were collected using a decontaminated hand auger to remove soil from the ground surface to a depth of 6 inches. The soil from the hole was placed in a 4-ounce wide mouth jar. The jar was labeled with the sample location and the date and time collected. Additional soil was placed in a second 4-ounce wide mouth jar. Soil aliquots from one of the two 4-ounce jars from each sample location within an inference area were homogenized in a decontaminated

stainless steel bowl to make a composite sample. A portion of the well-mixed composite was placed in a new clean, 4-ounce jar.

Concrete samples were collected by using an electrically driven rotohammer with a 1-inch-diameter decontaminated steel carbide drill bit to drill a hole approximately 3 inches deep into the concrete slab within 6 inches of the marked node locations. The pulverized concrete from the first sample location was collected using a decontaminated stainless steel spoon and placed into a 2-ounce sample jar. Additional pulverized concrete from the hole was placed in a second 2-ounce wide mouth jar as a portion of the composite sample. The composite concrete slab sample was created from the four concrete sample portions (C210-3-07 through C210-3-10) within the slab inference area. The composite sample portions were homogenized in a decontaminated stainless steel bowl. A portion of the well-mixed composite will be placed in a new clean, 2-ounce jar to make the composite sample.

Wood samples were collected using an electrically driven saw with a decontaminated, narrow blade to remove a small portion of the wooden platform. Sampling was targeted at stained locations on the wood platform to represent a conservative sample for disposal profiling. The wood piece cut from the platform was placed in an 8-ounce wide mouth jar. Due to the initial inadequate sample mass/volume, an additional wood sample was later collected.

Soil, concrete, and wood samples were collected in laboratory-supplied sample jars, labeled, and stored in an ice-cooled chest and transported to the laboratory following chain-of-custody procedures.

3.2 Field Procedures

Sample collection was conducted in accordance with work plan (AMEC, 2010), which detailed field methods for sample collection, sample designation, equipment decontamination, and documentation. These methods include porous medium (soil, concrete, and wood) sampling procedures in accordance with TSCA guidance.

3.3 Analytical Methods

The samples were analyzed by Analytical Resources, Inc., of Tukwila, Washington. Soil, concrete, and wood samples collected were analyzed for PCBs using U.S. Environmental Protection Agency (EPA) Method 8082.

For evaluating wood disposal options, wood samples were also analyzed for the following analytes:

- volatile organic compounds (VOCs) by the toxicity characteristic leaching procedure (TCLP) by EPA Method 8260C;
- total petroleum hydrocarbons – creosote by Ecology Method NWTPH-Dx;
- VOCs by the TCLP by EPA Method 8260C;

- semivolatile organic compounds (SVOCs) by EPA Method 8270D; and
- SVOCs by the TCLP by EPA Method 8270D.

3.4 Decision Criteria

Analytical results for the composite samples were compared with decision criteria presented in Table 2. The decision criteria are based on the 1 mg/kg total PCB cleanup level. The decision criteria in Table 2 are used as a screening tool to determine if concentrations of PCBs exceed the cleanup level in one or more individual samples that comprise the composite samples, while minimizing the chance for false positives. The method used to calculate the decision criteria is based on EPA guidance for PCB samples (EPA, 1985).

3.5 Quality Control

The quality assurance and quality control (QA/QC) procedures outlined in the Quality Assurance Project Plan (QAPP) presented in Section 6.0 of the approved RI Work Plan (Weston, 1998) were followed for sampling performed during this project.

3.6 Waste Management

Management of wastes generated during field activities followed the guidelines described in the approved RI Work Plan (Weston, 1998). Spent personal protective equipment and decontamination water were managed by Boeing.

4.0 RESULTS

Results of laboratory analysis for PCBs in soil, concrete and wood samples are presented in Table 2. Table 2 presents composite and primary sample results (where analyzed) together with associated decision criteria and cleanup goals. PCBs were not detected above the cleanup level of 1 mg/kg for any sample collected. Additionally, PCBs were not detected in any composite samples. Analytical results are presented in Attachment A.

4.1 Composite Soil Samples

PCBs were not detected in composite C210-1A-COMP and composite C210-2A-COMP above the laboratory reporting limits (0.13 mg/kg and 0.15 mg/kg, respectively). Based on these results, the results did not exceed the three-sample composite decision criteria of 0.47 mg/kg; therefore, the discrete primary samples that made up these two composite samples were not analyzed.

4.2 Composite Concrete Samples

No PCBs were detected above the laboratory reporting limit (0.14 mg/kg) in the composite concrete sample (C210-3A-COMP). Based on these results, the results did not exceed the four-sample composite decision criteria of 0.36 mg/kg; the discrete primary samples that made up this composite sample were not analyzed.

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Table 3 – Analytical Results for Detections in Wood at the C-2 Transformer Pad

Figure 1 –Transformer Location Map

Figure 2 – Sample Locations C-2 Transformer Pad

Attachment A – Analytical Data

TABLES

TABLE 1

**HISTORICAL ANALYTICAL RESULTS FOR PCBS IN SOIL
AT THE C-2 TRANSFORMER PAD^{1, 2}**

Renton Municipal Airport
Renton, Washington

concentrations in mg/kg

Sample ID	C2-1-E	C2-2W	C2-3D	C2-4-D	C2-5-S	C2-5-D
Sample Date	6/4/2004	6/4/2004	7/6/2005	7/6/2005	7/6/2005	7/6/2005
Matrix	Soil	Soil	Soil	Soil	Soil	Soil
Aroclor 1016	ND	ND	0.0098 U	0.0099 U	0.0098 U	0.0098 U
Aroclor 1248	0.059	0.49	0.7	0.0099 U	0.039 UJ	0.039 UJ
Aroclor 1254	ND	ND	0.0098 U	0.013	0.12	0.052
Aroclor 1260	0.13	0.13	0.059 UJ	0.0099 U	0.16	0.04
Total PCBs	0.189	0.62	0.7	0.013	0.28	0.092

Notes

1. Results in **bold** indicate a detected value.
2. Data qualifiers are as follows:
 U = analyte was not detected at the reported concentration.
 UJ = analyte was not detected at the level greater than or equal to reported adjusted reporting limit. However, the reported adjusted reporting limit is approximate and may be inaccurate or imprecise.

Abbreviations

mg/kg = milligrams per kilogram
 ND = not detected
 PCBs = polychlorinated biphenyls

TABLE 2

**ANALYTICAL RESULTS FOR PCBs AND CLEANUP LEVELS
AT THE C-2 TRANSFORMER PAD^{1, 2}**
Renton Municipal Airport
Renton, Washington

concentrations in mg/kg

Sample ID	C210-1A-COMP	C210-2A-COMP	C210-3A-COMP	C210-3-DUP	C210-4-11
	4/7/2010	4/7/2010	4/7/2010	4/7/2010	4/7/2010
Sample Date					
Matrix	Soil	Soil	Concrete	Concrete	Wood
Inference Unit	1	2	3	3	4
Number of Samples in Composite	3	3	4	4	--
Aroclor 1016	0.130 U	0.150 U	0.140 U	0.130 U	0.031 U
Aroclor 1242	0.130 U	0.150 U	0.140 U	0.130 U	0.031 U
Aroclor 1248	0.130 U	0.150 U	0.140 U	0.130 U	0.031 U
Aroclor 1254	0.130 U	0.150 U	0.140 U	0.130 U	0.031 U
Aroclor 1260	0.130 U	0.150 U	0.140 U	0.130 U	0.064
Aroclor 1221	0.130 U	0.150 U	0.140 U	0.130 U	0.031 U
Aroclor 1232	0.130 U	0.150 U	0.140 U	0.130 U	0.031 U
Total PCBs	0.130 U	0.150 U	0.140 U	0.130 U	0.064
Composite Sample Decision Criteria ⁴	0.47	0.47	0.36	0.36	--
Cleanup Level For Bulk PCB Remediation Waste ⁵	1.0				
MTCA Method A Soil Cleanup Levels for Unrestricted Properties ⁶	1.0				

Notes

- All samples were collected on April 7, 2010, and analyzed for PCBs by EPA Method 8082 at Analytical Resources Incorporated, in Tukwila, Washington.
- Results in **bold** indicate a detected value.
- Data qualifiers are as follows:
-- = not applicable; sample is not a composite.
U = analyte was not detected at the reported concentration.
- The Decision Criteria are calculated using the method described by the EPA (1985). The composite sample decision criteria are calculated by this formula:
$$(0.8) \cdot (1 \text{ mg/kg}) + (2.576) \cdot (0.3) \cdot (0.8) \cdot (1.0) = 1.42 \text{ mg/kg / number of subsamples in composite.}$$
- PCB cleanup levels for bulk remediation waste are established in the Toxic Substances Control Act (as based 40 CFR Part 761.61).
- Method A Soil Cleanup Levels for Unrestricted Properties from Table 740-1 from Washington State Department of Ecology, Toxic Cleanup Program, Model Toxic Control Act, Publication No. 94-06, Revised November 2007 or from Cleanup Levels and Risk Calculations website (<https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>).

Abbreviations

mg/kg = milligrams per kilogram
PCBs = polychlorinated biphenyls

TABLE 3

**ANALYTICAL RESULTS FOR DETECTIONS
IN WOOD AT THE C-2 TRANSFORMER PAD^{1,2}**

Renton Municipal Airport
Renton, Washington

Sample ID	C210-4-11	Units
Sample Date	4/23/2010	
Matrix	Wood	
SVOCs		
Bis (2-Ethylhexyl) phthalate	580	µg/kg
TPH		
TPH-D ³	12,000	mg/kg
Creosote ⁴	72,000	mg/kg

Notes

1. All samples were analyzed for Semi Volatiles and toxicity characteristic leaching procedure (TCLP) for Semi Volatiles using EPA Method 8270D; TCLP for Volatiles by EPA Method 8260C; NWTPHD for diesel, motor oil and creosote.
2. Only constituents detected in at least one sample are presented. A full list of analytes is presented in the analytical laboratory reports.
3. TPH-D = Total Petroleum Hydrocarbons - Diesel Range C12 through C24 using Washington State Department of Ecology NWTPH analytical methods.
4. Creosote = Total Petroleum Hydrocarbons - Creosote Range C12 through C22 using Washington State Department of Ecology NWTPH analytical methods.

Abbreviations

µg/kg = micrograms per kilogram
 mg/kg = milligrams per kilogram
 SVOCs = semivolatile organic compounds
 TPH = total petroleum hydrocarbons

FIGURES

LAKE WASHINGTON

BOEING
RENTON
FACILITY

TRANSFORMER
PAD C-2

RAINIER AVENUE

RENTON MUNICIPAL AIRPORT

CEDAR RIVER WATERWAY

RENTON
MEMORIAL
HS STADIUM

AIRPORT WAY S

LOGAN AVENUE

PARKING LOT 11 @ 2

PARK AVENUE

GARDEN AVENUE

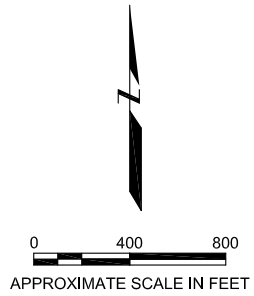
N 8TH ST

N 6TH ST

GARDEN AVENUE

EXPLANATION

--- BOEING RENTON
FACILITY BOUNDARY

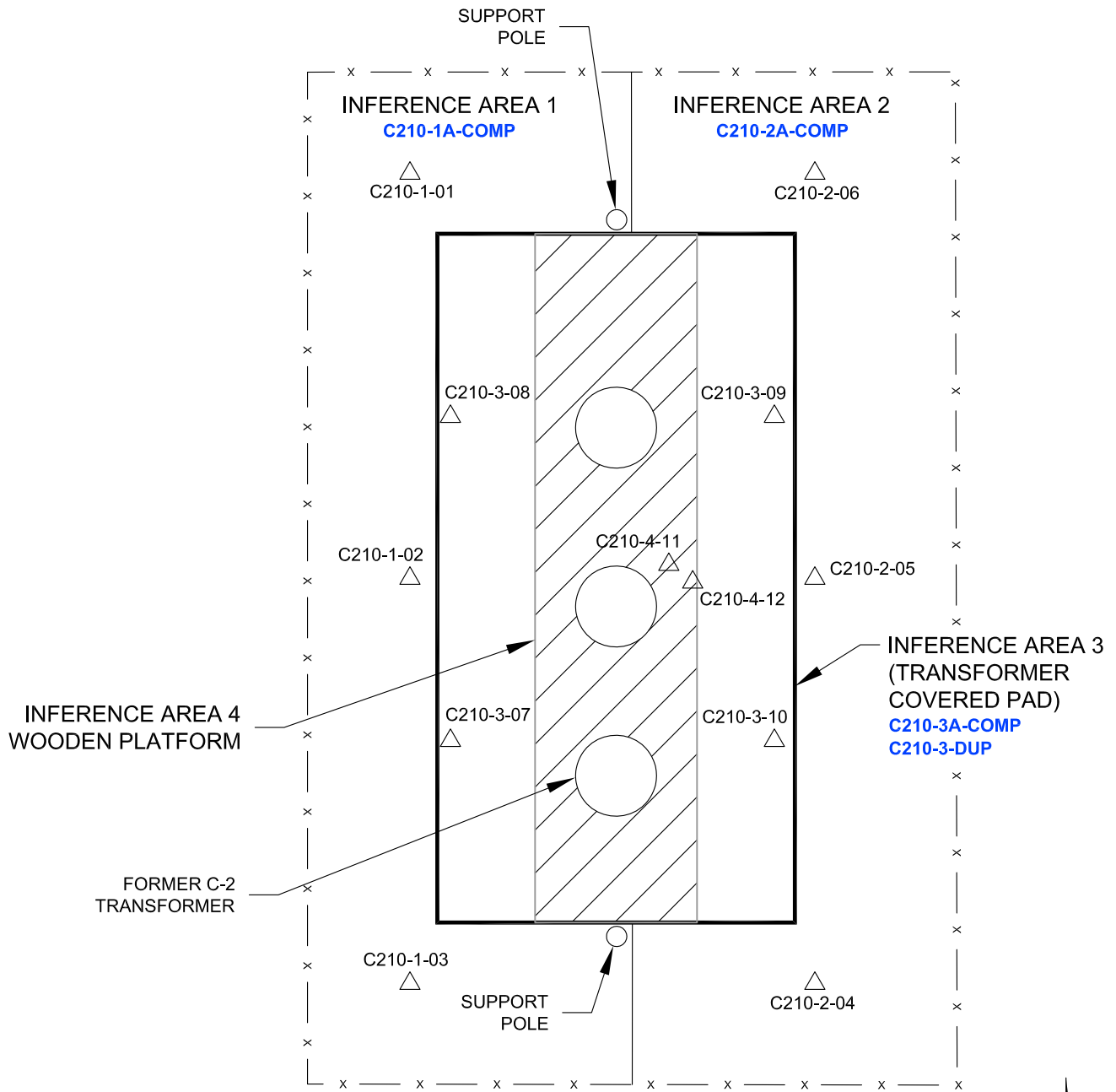


TRANSFORMER LOCATION MAP Renton Municipal Airport Renton, Washington			
By: APS	Date: 05/12/10	Project No.	8888
AMEC Geomatrix		Figure	1



Plot Date: 05/12/10 - 2:27pm. Plotted by: adam.stenberg
Drawing Path: S:\8888_2006\040_C-2_Transformer\CAD, Drawing Name: BoeingRenton_C-2_TransformerPad_032910.dwg

Plot Date: 05/13/10 - 1:51pm. Plotted by: adam.stenberg
 Drawing Path: S:\8888_2006\040_C-2_Transformer\CAD\ Drawing Name: BoeingRenton_C-2_TransformerPad_032910.dwg



EXPLANATION

- C210-3-10 PRIMARY SAMPLE LOCATION
- C210-3A-COMP** COMPOSITE SAMPLE ID



SAMPLE LOCATIONS C-2 TRANSFORMER PAD Renton Municipal Airport Renton, Washington			
By: APS	Date: 05/13/10	Project No.	8888
AMEC Geomatrix		Figure	2



ATTACHMENT A

Analytical Data



Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 15, 2010

Dave Haddock
AMEC GeoMatrix
One Union Square
600 University Street, Suite 1020
Seattle, WA 98101

RE: Project: Boeing Renton Airport
ARI Job: QR92

Dear Mr. Haddock,

Please find enclosed a copy of the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted several samples in good condition on April 7, 2010. There were no discrepancies between the COC and the sample container labels. The samples were logged on two different ARI SDGs based on turn around times. Please see final report QR84 for other associated sample data.

The sample was analyzed for PCBs, as requested on the COC.

There were no anomalies associated with the sample.

Quality control analysis results are included for your review. Copies of the reports 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
www.arilabs.com

Enclosures

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 5-Standard Turn-around Requested: 2 of 2
 ARI Client Company: AMEC Geomatrix Phone: 206-838-8475
 Client Contact: Charles Dowman
 Client Project Name: Boeing Renton Airport
 Client Project #: 8888-007 Samplers: C. Dowman

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



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments	
					PCBS by 80824 (defecation limit = 0.20 mg/kg)	NMTPH-DX for CREOSOTE range	Total SVOCs by 8270	TCF SVOCs		TCF VOCs
C210-3-07	4/7/10	1003	concrete	1-202	X					
C210-3-08		1015	concrete	1-202	X					
C210-3-09		1075	concrete	1-202	X					
EB01-C2-0710		1050	water	1-1L Amber	X					
C210-3-10		1057	concrete	1-202	X					
C210-3-DUP		1059	concrete	1-202	X					
C210-3A-Comp		1104	concrete	1-202	X					
C210-4-11		1140	wood	2-802	X					
C210-2-04		1210	soil	1-402	X					
C210-2-05		1220	soil	1-402	X					
Comments/Special Instructions	Relinquished by: <u>[Signature]</u> Printed Name: <u>Charles Dowman</u> Company: <u>AMEC Geomatrix</u> Date & Time: <u>4/7/10 1430</u>				Relinquished by: <u>[Signature]</u> Printed Name: <u>A. Volgardsen</u> Company: <u>ARI</u> Date & Time: <u>4/7/10 1440</u>				Received by: <u>[Signature]</u> Printed Name: _____ Company: _____ 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: AMEC Boeing
 COC No(s): _____ (NA)
 Assigned ARI Job No: QR84 QR92

Project Name: Boeing Renton Airport
 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)..... 21
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619
 Cooler Accepted by: AV Date: 4/7/10 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..... (NA)
 Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JP JW Date: 4/8/10 Time: 1115

**** 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"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: C210-4-11
SAMPLE

Lab Sample ID: QR92A
LIMS ID: 10-9073
Matrix: Wood
Data Release Authorized: *MB*
Reported: 04/15/10

QC Report No: QR92-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/13/10
Date Analyzed: 04/14/10 13:14
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisol Cleanup: No

Sample Amount: 3.22 g-as-rec
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00
Silica Gel: No
Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	31	< 31 U
53469-21-9	Aroclor 1242	31	< 31 U
12672-29-6	Aroclor 1248	31	< 31 U
11097-69-1	Aroclor 1254	31	< 31 U
11096-82-5	Aroclor 1260	31	64
11104-28-2	Aroclor 1221	31	< 31 U
11141-16-5	Aroclor 1232	31	< 31 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	63.5%
Tetrachlorometaxylene	48.8%

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-041310

METHOD BLANK

Lab Sample ID: MB-041310

LIMS ID: 10-9073

Matrix: Wood

Data Release Authorized: 

Reported: 04/15/10

QC Report No: QR92-The Boeing Company

Project: Boeing Renton Airport

8888.007

Date Sampled: NA

Date Received: NA

Date Extracted: 04/13/10

Date Analyzed: 04/14/10 12:10

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 3.00 g

Final Extract Volume: 1.0 mL

Dilution Factor: 1.00

Silica Gel: Yes

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	6.7	< 6.7 U
53469-21-9	Aroclor 1242	6.7	< 6.7 U
12672-29-6	Aroclor 1248	6.7	< 6.7 U
11097-69-1	Aroclor 1254	6.7	< 6.7 U
11096-82-5	Aroclor 1260	6.7	< 6.7 U
11104-28-2	Aroclor 1221	6.7	< 6.7 U
11141-16-5	Aroclor 1232	6.7	< 6.7 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	115%
Tetrachlorometaxylene	101%

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Wood


QC Report No: QR92-The Boeing Company
Project: Boeing Renton Airport
8888.007

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
MB-041310	115%	30-160	101%	30-160	0
LCS-041310	80.5%	30-160	66.8%	30-160	0
LCSD-041310	104%	30-160	86.2%	30-160	0
C210-4-11	63.5%	30-160	48.8%	30-160	0

Client Specified Control Limits
Prep Method: SW3550B
Log Number Range: 10-9073 to 10-9073

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-041310
LCS/LCSD

Lab Sample ID: LCS-041310
LIMS ID: 10-9073
Matrix: Wood
Data Release Authorized: 
Reported: 04/15/10

QC Report No: QR92-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 04/13/10

Sample Amount LCS: 3.00 g-as-rec
LCSD: 3.00 g-as-rec

Date Analyzed LCS: 04/14/10 12:32
LCSD: 04/14/10 12:53

Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

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

Silica Gel: Yes

Percent Moisture: NA

Analyte	Spike		LCS		Spike		LCSD		RPD
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	LCSD		
Aroclor 1016	135	167	81.0%	178	167	107%	27.5%	27.5%	
Aroclor 1260	105	167	63.0%	137	167	82.2%	26.4%	26.4%	

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	80.5%	104%
Tetrachlorometaxylene	66.8%	86.2%

Results reported in $\mu\text{g}/\text{kg}$ (ppb)
RPD calculated using sample concentrations per SW846.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 19, 2010

Dave Haddock
AMEC GeoMatrix
One Union Square
600 University Street, Suite 1020
Seattle, WA 98101

RE: Project: Boeing Renton Airport
ARI Job: QR84

Dear Mr. Haddock,

Please find enclosed a copy of the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted several samples in good condition on April 7, 2010. There were no discrepancies between the COC and the sample container labels. The samples were logged on two different ARI SDGs based on turn around times. Please see final report QR92 for other associated sample data. Several samples have been placed on hold pending further instructions.

The samples were analyzed for PCBs, as requested on the COC.

There were no anomalies associated with the samples.

Quality control analysis results are included for your review. Copies of the reports 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 that reads "Kelly Bottom".

Kelly Bottom
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

Enclosures

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 5-Standard Turn-around Requested: 5-Standard

ARI Client Company: AMEC Geomatrix Phone: 206-838-8475

Client Contact: Charles Dowman

Client Project Name: Boeing Renton Airport

Client Project #: 8888.007 Samplers: C. Dowman

Page: 1 of 2

Date: 5/7/10 Ice Present? Y

No. of Coolers: 1 Cooler Temps: 2.1

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



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					PCBs by 8082A (detected limit = 0.20 mg/kg)	NMTPH-DX for creosote range	Total SVOCs by 8270	TCF SVOCs	
C210-3-07	5/7/10	1003	concrete	1-202	X				HOLD All individual SAMPLES UNTIL PCR have been received. CALL prior to deployment.
C210-3-08		1015	concrete	1-202	X				
C210-3-09		1075	concrete	1-202	X				
EB01-C2-040710		1050	water	1-1L Amber	X				
C210-3-10		1057	concrete	1-202	X				
C210-3-DUP		1059	concrete	1-202	X				Note date is
C210-3A-CAMP		1104	concrete	1-202	X	X	X	X	040710 please see sample labels and correct.
C210-4-11		1140	wood	2-802	X	X	X	X	
C210-2-04		1210	soil	1-402	X				
C210-2-05		1220	soil	1-402	X				
Comments/Special Instructions	Relinquished by: (Signature) <u>[Signature]</u> Printed Name: <u>Charles Dowman</u> Company: <u>AMEC Geomatrix</u> Date & Time: <u>5/7/10 1430</u>				Received by: (Signature) <u>[Signature]</u> Printed Name: <u>A. Volgardsen</u> Company: <u>ARI</u> Date & Time: <u>4/7/10 1440</u>				Relinquished by: (Signature) _____ Printed Name: _____ Company: _____ 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 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: WPEY
 Turn-around Requested: Standard
 ARI Client Company: AMEC Geomatrix
 Phone: 206-838-8475
 Client Contact: Charles Dawman
 Client Project Name: 8888-007 Boeing Renton Airport
 Client Project #: ↓
 Samplers: C. Dawman

Page: 2 of 2
 Date: 5/7/10
 No. of Coolers: 1
 Ice Present? Y
 Cooler Temps: 2.1

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



Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested				Notes/Comments
					TCAP SVOCs	TCAP VOCs	TCAP SVOCs by 8270	TCAP VOCs	
C210-2-06	5/7/10	1228	Soil	1-402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C210-2A-COMP		1234	Soil	1-402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C210-1-03		1248	Soil	1-402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C210-1-02		1257	Soil	1-402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C210-1-01		1307	Soil	1-402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
C210-1A-COMP		1311	Soil	1-402	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<i>Chawman</i>									
Comments/Special Instructions	Relinquished by:								
	Received by:								
	(Signature)								
	Printed Name:								
	Company:								
	Date & Time:								
	Relinquished by:								
	(Signature)								
	Printed Name:								
	Company:								
	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: AMEC Boeing
 COC No(s): _____ (NA)
 Assigned ARI Job No: Q284

Project Name: Boeing Renton Airport
 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)..... 21 _____
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619
 Cooler Accepted by: AV Date: 4/7/10 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..... (NA) _____
 Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JP Date: 4/8/10 Time: 101400 1240
**** 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"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: C210-3-DUP
SAMPLE

Lab Sample ID: QR84E
LIMS ID: 10-9109
Matrix: Concrete
Data Release Authorized: 
Reported: 04/16/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/12/10
Date Analyzed: 04/14/10 15:22
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 3.03 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 5.00
Silica Gel: No
Percent Moisture: 3.8%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	130	< 130 U
53469-21-9	Aroclor 1242	130	< 130 U
12672-29-6	Aroclor 1248	130	< 130 U
11097-69-1	Aroclor 1254	130	< 130 U
11096-82-5	Aroclor 1260	130	< 130 U
11104-28-2	Aroclor 1221	130	< 130 U
11141-16-5	Aroclor 1232	130	< 130 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	84.6%
Tetrachlorometaxylene	75.1%

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: C210-3A-COMP
SAMPLE

Lab Sample ID: QR84F

LIMS ID: 10-9110

Matrix: Concrete

Data Release Authorized: *CP*

Reported: 04/16/10

QC Report No: QR84-The Boeing Company

Project: Boeing Renton Airport

8888.007

Date Sampled: 04/07/10

Date Received: 04/07/10

Date Extracted: 04/12/10

Date Analyzed: 04/14/10 15:44

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 2.89 g-dry-wt

Final Extract Volume: 4.0 mL

Dilution Factor: 5.00

Silica Gel: No

Percent Moisture: 4.6%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	140	< 140 U
53469-21-9	Aroclor 1242	140	< 140 U
12672-29-6	Aroclor 1248	140	< 140 U
11097-69-1	Aroclor 1254	140	< 140 U
11096-82-5	Aroclor 1260	140	< 140 U
11104-28-2	Aroclor 1221	140	< 140 U
11141-16-5	Aroclor 1232	140	< 140 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.4%
Tetrachlorometaxylene	75.1%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: C210-2A-COMP
SAMPLE

Lab Sample ID: QR84J
LIMS ID: 10-9114
Matrix: Soil
Data Release Authorized: *B*
Reported: 04/16/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/12/10
Date Analyzed: 04/14/10 16:05
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 2.73 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 5.00
Silica Gel: No
Percent Moisture: 12.5%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	150	< 150 U
53469-21-9	Aroclor 1242	150	< 150 U
12672-29-6	Aroclor 1248	150	< 150 U
11097-69-1	Aroclor 1254	150	< 150 U
11096-82-5	Aroclor 1260	150	< 150 U
11104-28-2	Aroclor 1221	150	< 150 U
11141-16-5	Aroclor 1232	150	< 150 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	96.4%
Tetrachlorometaxylene	81.8%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: C210-1A-COMP
SAMPLE

Lab Sample ID: QR84N
LIMS ID: 10-9118
Matrix: Soil
Data Release Authorized: *AB*
Reported: 04/16/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/12/10
Date Analyzed: 04/14/10 16:26
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 2.98 g-dry-wt
Final Extract Volume: 4.0 mL
Dilution Factor: 5.00
Silica Gel: No
Percent Moisture: 16.7%

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	130	< 130 U
53469-21-9	Aroclor 1242	130	< 130 U
12672-29-6	Aroclor 1248	130	< 130 U
11097-69-1	Aroclor 1254	130	< 130 U
11096-82-5	Aroclor 1260	130	< 130 U
11104-28-2	Aroclor 1221	130	< 130 U
11141-16-5	Aroclor 1232	130	< 130 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	91.8%
Tetrachlorometaxylene	83.4%

ORGANICS ANALYSIS DATA SHEET

PCB by GC/ECD Method SW8082

Page 1 of 1

Sample ID: MB-041210

METHOD BLANK

Lab Sample ID: MB-041210

LIMS ID: 10-9109

Matrix: Concrete

Data Release Authorized: *B*

Reported: 04/16/10

QC Report No: QR84-The Boeing Company

Project: Boeing Renton Airport

8888.007

Date Sampled: NA

Date Received: NA

Date Extracted: 04/12/10

Date Analyzed: 04/14/10 14:18

Instrument/Analyst: ECD5/JGR

GPC Cleanup: No

Sulfur Cleanup: Yes

Acid Cleanup: Yes

Florisil Cleanup: No

Sample Amount: 2.00 g

Final Extract Volume: 4.0 mL

Dilution Factor: 1.00

Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	40	< 40 U
53469-21-9	Aroclor 1242	40	< 40 U
12672-29-6	Aroclor 1248	40	< 40 U
11097-69-1	Aroclor 1254	40	< 40 U
11096-82-5	Aroclor 1260	40	< 40 U
11104-28-2	Aroclor 1221	40	< 40 U
11141-16-5	Aroclor 1232	40	< 40 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	77.8%
Tetrachlorometaxylene	76.8%

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Concrete

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007

<u>Client ID</u>	<u>DCBP % REC</u>	<u>DCBP LCL-UCL</u>	<u>TCMX % REC</u>	<u>TCMX LCL-UCL</u>	<u>TOT OUT</u>
MB-041210	77.8%	30-160	76.8%	30-160	0
LCS-041210	77.2%	30-160	81.2%	30-160	0
LCSD-041210	79.2%	30-160	78.5%	30-160	0
C210-3-DUP	84.6%	30-160	75.1%	30-160	0
C210-3A-COMP	83.4%	30-160	75.1%	30-160	0
C210-2A-COMP	96.4%	30-160	81.8%	30-160	0
C210-1A-COMP	91.8%	30-160	83.4%	30-160	0

Microwave (MARS) Control Limits
Prep Method: SW3546
Log Number Range: 10-9109 to 10-9118

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-041210
LCS/LCSD

Lab Sample ID: LCS-041210
LIMS ID: 10-9109
Matrix: Concrete
Data Release Authorized *AB*
Reported: 04/16/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 04/12/10

Sample Amount LCS: 2.00 g-dry-wt
LCSD: 2.00 g-dry-wt

Date Analyzed LCS: 04/14/10 14:40
LCSD: 04/14/10 15:01

Final Extract Volume LCS: 4.0 mL
LCSD: 4.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

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

Silica Gel: No
Percent Moisture: NA

Analyte	Spike		LCS		Spike		LCSD		RPD
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	LCSD		
Aroclor 1016	1080	1000	108%	1100	1000	110%	1.8%		
Aroclor 1260	769	1000	76.9%	793	1000	79.3%	3.1%		

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	77.2%	79.2%
Tetrachlorometaxylene	81.2%	78.5%

Results reported in $\mu\text{g}/\text{kg}$ (ppb)
RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: EB01-C2-040710
SAMPLE

Lab Sample ID: QR840
LIMS ID: 10-9119
Matrix: Water
Data Release Authorized: *AB*
Reported: 04/19/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/12/10
Date Analyzed: 04/14/10 04:01
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: No

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	1.0	< 1.0 U
53469-21-9	Aroclor 1242	1.0	< 1.0 U
12672-29-6	Aroclor 1248	1.0	< 1.0 U
11097-69-1	Aroclor 1254	1.0	< 1.0 U
11096-82-5	Aroclor 1260	1.0	< 1.0 U
11104-28-2	Aroclor 1221	1.0	< 1.0 U
11141-16-5	Aroclor 1232	1.0	< 1.0 U

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	46.2%
Tetrachlorometaxylene	67.2%

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: MB-041210
METHOD BLANK

Lab Sample ID: MB-041210
LIMS ID: 10-9119
Matrix: Water
Data Release Authorized: *AS*
Reported: 04/19/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: NA
Date Received: NA

Date Extracted: 04/12/10
Date Analyzed: 04/14/10 02:57
Instrument/Analyst: ECD5/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes

Sample Amount: 500 mL
Final Extract Volume: 5.0 mL
Dilution Factor: 1.00
Silica Gel: No
Acid Cleanup: No

CAS Number	Analyte	RL	Result
12674-11-2	Aroclor 1016	1.0	< 1.0 U
53469-21-9	Aroclor 1242	1.0	< 1.0 U
12672-29-6	Aroclor 1248	1.0	< 1.0 U
11097-69-1	Aroclor 1254	1.0	< 1.0 U
11096-82-5	Aroclor 1260	1.0	< 1.0 U
11104-28-2	Aroclor 1221	1.0	< 1.0 U
11141-16-5	Aroclor 1232	1.0	< 1.0 U

Reported in $\mu\text{g/L}$ (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	62.2%
Tetrachlorometaxylene	67.0%

SW8082/PCB WATER SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007

<u>Client ID</u>	<u>DCBP % REC</u>	<u>DCBP LCL-UCL</u>	<u>TCMX % REC</u>	<u>TCMX LCL-UCL</u>	<u>TOT OUT</u>
MB-041210	62.2%	41-111	67.0%	40-118	0
LCS-041210	59.8%	41-111	68.5%	40-118	0
LCSD-041210	62.2%	41-111	66.0%	40-118	0
EB01-C2-040710	46.2%	29-118	67.2%	38-118	0

Prep Method: SW3510C
Log Number Range: 10-9119 to 10-9119

ORGANICS ANALYSIS DATA SHEET
PCB by GC/ECD Method SW8082
Page 1 of 1

Sample ID: LCS-041210
LCS/LCSD

Lab Sample ID: LCS-041210
LIMS ID: 10-9119
Matrix: Water
Data Release Authorized: *[Signature]*
Reported: 04/19/10

QC Report No: QR84-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 04/12/10

Sample Amount LCS: 500 mL
LCSD: 500 mL

Date Analyzed LCS: 04/14/10 03:19
LCSD: 04/14/10 03:40

Final Extract Volume LCS: 5.0 mL
LCSD: 5.0 mL

Instrument/Analyst LCS: ECD5/JGR
LCSD: ECD5/JGR

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes

Silica Gel: No
Acid Cleanup: No

Analyte	Spike		LCS	LCSD	Spike		LCSD	RPD
	LCS	Added-LCS	Recovery		Added-LCSD	Recovery		
Aroclor 1016	5.16	5.00	103%	5.09	5.00	102%	1.4%	
Aroclor 1260	3.91	5.00	78.2%	3.86	5.00	77.2%	1.3%	

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	59.8%	62.2%
Tetrachlorometaxylene	68.5%	66.0%

Results reported in $\mu\text{g/L}$
RPD calculated using sample concentrations per SW846.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 23, 2010

Dave Haddock
AMEC GeoMatrix
One Union Square
600 University Street, Suite 1020
Seattle, WA 98101

RE: Project: Boeing Renton Airport
ARI Job: QT39

Dear Mr. Haddock,

Please find enclosed a copy of the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted several samples in good condition on April 7, 2010. There were no discrepancies between the COC and the sample container labels. The samples were logged on two different ARI SDGs based on turn around times. Please see final reports QR84 and QR92 for other associated sample data.

At the request of AMEC GeoMatrix, sample **C210-4-11** was removed from hold and analyzed for SVOCs, TCLP SVOCs and NWTPH-Dx, as requested.

The SVOCs LCS is out of control high for Nitrobenzene, Benzo (b) and Benzo (k) fluoranthene and the LCSD is out of control high for Nitrobenzene. No further corrective action was taken.

There were no other anomalies associated with the sample.

Quality control analysis results are included for your review. Copies of the reports 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 blue ink, appearing to read "Kelly Bottem".

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

Enclosures

Subject: RE: QR92 waste char sample for renton
From: "Dowman, Charles" <Charles.Dowman@amec.com>
Date: Tue, 20 Apr 2010 14:37:34 -0400
To: Kelly Bottem <kellyb@arilabs.com>, "Haddock, Dave" <Dave.Haddock@amec.com>, "Bach, Carl M" <carl.m.bach@boeing.com>

Hello Kelly,
As per Boeings request at the initial site walk, please run the additional analysis that were placed on hold pending the PCB analytical results for the wood sample.

These were NW TPH-dx for creosote range,
Total SVOCs
TCLP SVOCs

For the TCLP VOCs there is an additional sample volume that is necessary for this analysis. I will coordinate to collect this sample later this week.

Thanks for all your assistance,

Charles Dowman, P.G.
Hydrogeologist
206-838-8475-direct
415-515-2624-mobile

-----Original Message-----

From: Kelly Bottem [mailto:kellyb@arilabs.com]
Sent: Tuesday, April 20, 2010 9:26 AM
To: Haddock, Dave; Dowman, Charles; Bach, Carl M
Subject: QR92 waste char sample for renton

You have one day left of holding time for any follow up analyses on the wood sample. Please let me know what you would like to run ASAP. Should have your revised lower PCB data today for the comp samples.
Thanks,
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
E-Mail: kellyb@arilabs.com
Fax: 206-695-6201
Cell: 206-228-1385

"Never interrupt someone doing something you said couldn't be done" - Amelia Earhart

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Cooler Receipt Form

ARI Client: AMEC / Boeing
 COC No(s): _____ (NA)
 Assigned ARI Job No: QR94 QR92

Project Name: Boeing Renton Airport
 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)..... 21
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 909411619
 Cooler Accepted by: AV Date: 4/7/10 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: _____ (NA)
 Was Sample Split by ARI: (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JR JW Date: 4/8/10 Time: 1115

**** 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"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: C210-4-11
SAMPLE

Lab Sample ID: QT39C
LIMS ID: 10-9943
Matrix: Wood
Data Release Authorized: 
Reported: 04/21/10

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/20/10
Date Analyzed: 04/21/10 14:40
Instrument/Analyst: NT6/JZ
GPC Cleanup: No

Sample Amount: 7.53 g-as-rec
Final Extract Volume: 0.5 mL
Dilution Factor: 5.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	330	< 330 U
111-44-4	Bis-(2-Chloroethyl) Ether	330	< 330 U
95-57-8	2-Chlorophenol	330	< 330 U
541-73-1	1,3-Dichlorobenzene	330	< 330 U
106-46-7	1,4-Dichlorobenzene	330	< 330 U
100-51-6	Benzyl Alcohol	1,700	< 1,700 U
95-50-1	1,2-Dichlorobenzene	330	< 330 U
95-48-7	2-Methylphenol	330	< 330 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	330	< 330 U
106-44-5	4-Methylphenol	330	< 330 U
621-64-7	N-Nitroso-Di-N-Propylamine	1,700	< 1,700 U
67-72-1	Hexachloroethane	330	< 330 U
98-95-3	Nitrobenzene	330	< 330 U
78-59-1	Isophorone	330	< 330 U
88-75-5	2-Nitrophenol	330	< 330 U
105-67-9	2,4-Dimethylphenol	330	< 330 U
65-85-0	Benzoic Acid	3,300	< 3,300 U
111-91-1	bis(2-Chloroethoxy) Methane	330	< 330 U
120-83-2	2,4-Dichlorophenol	1,700	< 1,700 U
120-82-1	1,2,4-Trichlorobenzene	330	< 330 U
91-20-3	Naphthalene	330	< 330 U
106-47-8	4-Chloroaniline	1,700	< 1,700 U
87-68-3	Hexachlorobutadiene	330	< 330 U
59-50-7	4-Chloro-3-methylphenol	1,700	< 1,700 U
91-57-6	2-Methylnaphthalene	330	< 330 U
77-47-4	Hexachlorocyclopentadiene	1,700	< 1,700 U
88-06-2	2,4,6-Trichlorophenol	1,700	< 1,700 U
95-95-4	2,4,5-Trichlorophenol	1,700	< 1,700 U
91-58-7	2-Chloronaphthalene	330	< 330 U
88-74-4	2-Nitroaniline	1,700	< 1,700 U
131-11-3	Dimethylphthalate	330	< 330 U
208-96-8	Acenaphthylene	330	< 330 U
99-09-2	3-Nitroaniline	1,700	< 1,700 U
83-32-9	Acenaphthene	330	< 330 U
51-28-5	2,4-Dinitrophenol	3,300	< 3,300 U
100-02-7	4-Nitrophenol	1,700	< 1,700 U
132-64-9	Dibenzofuran	330	< 330 U
606-20-2	2,6-Dinitrotoluene	1,700	< 1,700 U
121-14-2	2,4-Dinitrotoluene	1,700	< 1,700 U
84-66-2	Diethylphthalate	330	< 330 U
7005-72-3	4-Chlorophenyl-phenylether	330	< 330 U
86-73-7	Fluorene	330	< 330 U
100-01-6	4-Nitroaniline	1,700	< 1,700 U
534-52-1	4,6-Dinitro-2-Methylphenol	3,300	< 3,300 U

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: C210-4-11
SAMPLE

Lab Sample ID: QT39C
LIMS ID: 10-9943
Matrix: Wood
Date Analyzed: 04/21/10 14:40


QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	330	< 330 U
101-55-3	4-Bromophenyl-phenylether	330	< 330 U
118-74-1	Hexachlorobenzene	330	< 330 U
87-86-5	Pentachlorophenol	1,700	< 1,700 U
85-01-8	Phenanthrene	330	< 330 U
86-74-8	Carbazole	330	< 330 U
120-12-7	Anthracene	330	< 330 U
84-74-2	Di-n-Butylphthalate	330	< 330 U
206-44-0	Fluoranthene	330	< 330 U
129-00-0	Pyrene	330	< 330 U
85-68-7	Butylbenzylphthalate	330	< 330 U
91-94-1	3,3'-Dichlorobenzidine	1,700	< 1,700 U
56-55-3	Benzo(a)anthracene	330	< 330 U
117-81-7	bis(2-Ethylhexyl)phthalate	330	580
218-01-9	Chrysene	330	< 330 U
117-84-0	Di-n-Octyl phthalate	330	< 330 U
205-99-2	Benzo(b)fluoranthene	330	< 330 U
207-08-9	Benzo(k)fluoranthene	330	< 330 U
50-32-8	Benzo(a)pyrene	330	< 330 U
193-39-5	Indeno(1,2,3-cd)pyrene	330	< 330 U
53-70-3	Dibenz(a,h)anthracene	330	< 330 U
191-24-2	Benzo(g,h,i)perylene	330	< 330 U
90-12-0	1-Methylnaphthalene	330	< 330 U

Reported in $\mu\text{g}/\text{kg}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	50.0%	2-Fluorobiphenyl	50.2%
d14-p-Terphenyl	62.0%	d4-1,2-Dichlorobenzene	46.4%
d5-Phenol	44.5%	2-Fluorophenol	45.6%
2,4,6-Tribromophenol	102%	d4-2-Chlorophenol	49.1%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2Sample ID: MB-042010
METHOD BLANKLab Sample ID: MB-042010
LIMS ID: 10-9943
Matrix: Wood
Data Release Authorized: 
Reported: 04/21/10QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: NA
Date Received: NADate Extracted: 04/20/10
Date Analyzed: 04/21/10 11:58
Instrument/Analyst: NT6/JZ
GPC Cleanup: NoSample Amount: 7.50 g-as-rec
Final Extract Volume: 0.5 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	RL	Result
108-95-2	Phenol	67	< 67 U
111-44-4	Bis-(2-Chloroethyl) Ether	67	< 67 U
95-57-8	2-Chlorophenol	67	< 67 U
541-73-1	1,3-Dichlorobenzene	67	< 67 U
106-46-7	1,4-Dichlorobenzene	67	< 67 U
100-51-6	Benzyl Alcohol	330	< 330 U
95-50-1	1,2-Dichlorobenzene	67	< 67 U
95-48-7	2-Methylphenol	67	< 67 U
108-60-1	2,2'-Oxybis(1-Chloropropane)	67	< 67 U
106-44-5	4-Methylphenol	67	< 67 U
621-64-7	N-Nitroso-Di-N-Propylamine	330	< 330 U
67-72-1	Hexachloroethane	67	< 67 U
98-95-3	Nitrobenzene	67	< 67 U
78-59-1	Isophorone	67	< 67 U
88-75-5	2-Nitrophenol	67	< 67 U
105-67-9	2,4-Dimethylphenol	67	< 67 U
65-85-0	Benzoic Acid	670	< 670 U
111-91-1	bis(2-Chloroethoxy) Methane	67	< 67 U
120-83-2	2,4-Dichlorophenol	330	< 330 U
120-82-1	1,2,4-Trichlorobenzene	67	< 67 U
91-20-3	Naphthalene	67	< 67 U
106-47-8	4-Chloroaniline	330	< 330 U
87-68-3	Hexachlorobutadiene	67	< 67 U
59-50-7	4-Chloro-3-methylphenol	330	< 330 U
91-57-6	2-Methylnaphthalene	67	< 67 U
77-47-4	Hexachlorocyclopentadiene	330	< 330 U
88-06-2	2,4,6-Trichlorophenol	330	< 330 U
95-95-4	2,4,5-Trichlorophenol	330	< 330 U
91-58-7	2-Chloronaphthalene	67	< 67 U
88-74-4	2-Nitroaniline	330	< 330 U
131-11-3	Dimethylphthalate	67	< 67 U
208-96-8	Acenaphthylene	67	< 67 U
99-09-2	3-Nitroaniline	330	< 330 U
83-32-9	Acenaphthene	67	< 67 U
51-28-5	2,4-Dinitrophenol	670	< 670 U
100-02-7	4-Nitrophenol	330	< 330 U
132-64-9	Dibenzofuran	67	< 67 U
606-20-2	2,6-Dinitrotoluene	330	< 330 U
121-14-2	2,4-Dinitrotoluene	330	< 330 U
84-66-2	Diethylphthalate	67	< 67 U
7005-72-3	4-Chlorophenyl-phenylether	67	< 67 U
86-73-7	Fluorene	67	< 67 U
100-01-6	4-Nitroaniline	330	< 330 U
534-52-1	4,6-Dinitro-2-Methylphenol	670	< 670 U

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: MB-042010
METHOD BLANK

Lab Sample ID: MB-042010
LIMS ID: 10-9943
Matrix: Wood
Date Analyzed: 04/21/10 11:58

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007

CAS Number	Analyte	RL	Result
86-30-6	N-Nitrosodiphenylamine	67	< 67 U
101-55-3	4-Bromophenyl-phenylether	67	< 67 U
118-74-1	Hexachlorobenzene	67	< 67 U
87-86-5	Pentachlorophenol	330	< 330 U
85-01-8	Phenanthrene	67	< 67 U
86-74-8	Carbazole	67	< 67 U
120-12-7	Anthracene	67	< 67 U
84-74-2	Di-n-Butylphthalate	67	< 67 U
206-44-0	Fluoranthene	67	< 67 U
129-00-0	Pyrene	67	< 67 U
85-68-7	Butylbenzylphthalate	67	< 67 U
91-94-1	3,3'-Dichlorobenzidine	330	< 330 U
56-55-3	Benzo(a)anthracene	67	< 67 U
117-81-7	bis(2-Ethylhexyl)phthalate	67	< 67 U
218-01-9	Chrysene	67	< 67 U
117-84-0	Di-n-Octyl phthalate	67	< 67 U
205-99-2	Benzo(b)fluoranthene	67	< 67 U
207-08-9	Benzo(k)fluoranthene	67	< 67 U
50-32-8	Benzo(a)pyrene	67	< 67 U
193-39-5	Indeno(1,2,3-cd)pyrene	67	< 67 U
53-70-3	Dibenz(a,h)anthracene	67	< 67 U
191-24-2	Benzo(g,h,i)perylene	67	< 67 U
90-12-0	1-Methylnaphthalene	67	< 67 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	70.8%	2-Fluorobiphenyl	74.0%
d14-p-Terphenyl	85.2%	d4-1,2-Dichlorobenzene	69.6%
d5-Phenol	72.5%	2-Fluorophenol	74.9%
2,4,6-Tribromophenol	87.7%	d4-2-Chlorophenol	76.3%

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Wood

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007


Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
MB-042010	70.8%	74.0%	85.2%	69.6%	72.5%	74.9%	87.7%	76.3%	0	
LCS-042010	78.0%	77.6%	84.4%	74.0%	79.7%	79.2%	90.4%	80.8%	0	
LCSD-042010	84.0%	82.4%	86.4%	82.4%	86.7%	88.3%	94.4%	86.7%	0	
C210-4-11	50.0%	50.2%	62.0%	46.4%	44.5%	45.6%	102%	49.1%	0	

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(46-102)	(32-106)
(FBP) = 2-Fluorobiphenyl	(51-105)	(39-107)
(TPH) = d14-p-Terphenyl	(55-124)	(31-130)
(DCB) = d4-1,2-Dichlorobenzene	(48-104)	(38-102)
(PHL) = d5-Phenol	(44-110)	(27-112)
(2FP) = 2-Fluorophenol	(38-112)	(22-108)
(TBP) = 2,4,6-Tribromophenol	(54-120)	(31-131)
(2CP) = d4-2-Chlorophenol	(50-103)	(36-104)

Prep Method: SW3546
Log Number Range: 10-9943 to 10-9943

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 1 of 2

Sample ID: LCS-042010
LCS/LCSD

Lab Sample ID: LCS-042010
LIMS ID: 10-9943
Matrix: Wood
Data Release Authorized: 
Reported: 04/21/10

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted LCS/LCSD: 04/20/10

Sample Amount LCS: 7.50 g
LCSD: 7.50 g

Date Analyzed LCS: 04/21/10 12:30
LCSD: 04/21/10 13:02

Final Extract Volume LCS: 0.5 mL
LCSD: 0.5 mL

Instrument/Analyst LCS: NT6/JZ
LCSD: NT6/JZ

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	1090	1670	65.3%	1200	1670	71.9%	9.6%
Bis-(2-Chloroethyl) Ether	1020	1670	61.1%	1240	1670	74.3%	19.5%
2-Chlorophenol	1080	1670	64.7%	1230	1670	73.7%	13.0%
1,3-Dichlorobenzene	1100	1670	65.9%	1250	1670	74.9%	12.8%
1,4-Dichlorobenzene	1130	1670	67.7%	1280	1670	76.6%	12.4%
Benzyl Alcohol	2830	3330	85.0%	3140	3330	94.3%	10.4%
1,2-Dichlorobenzene	1110	1670	66.5%	1270	1670	76.0%	13.4%
2-Methylphenol	1120	1670	67.1%	1270	1670	76.0%	12.6%
2,2'-Oxybis(1-Chloropropane)	1090	1670	65.3%	1220	1670	73.1%	11.3%
4-Methylphenol	2350	3330	70.6%	2620	3330	78.7%	10.9%
N-Nitroso-Di-N-Propylamine	1140	1670	68.3%	1280	1670	76.6%	11.6%
Hexachloroethane	1120	1670	67.1%	1260	1670	75.4%	11.8%
Nitrobenzene	1930	1670	116%	2110	1670	126%	8.9%
Isophorone	1210	1670	72.5%	1310	1670	78.4%	7.9%
2-Nitrophenol	1110	1670	66.5%	1220	1670	73.1%	9.4%
2,4-Dimethylphenol	1090	1670	65.3%	1200	1670	71.9%	9.6%
Benzoic Acid	3250	5000	65.0%	3400	5000	68.0%	4.5%
bis(2-Chloroethoxy) Methane	1150	1670	68.9%	1250	1670	74.9%	8.3%
2,4-Dichlorophenol	1180	1670	70.7%	1290	1670	77.2%	8.9%
1,2,4-Trichlorobenzene	1120	1670	67.1%	1240	1670	74.3%	10.2%
Naphthalene	1190	1670	71.3%	1300	1670	77.8%	8.8%
4-Chloroaniline	3480	4000	87.0%	3910	4000	97.8%	11.6%
Hexachlorobutadiene	1100	1670	65.9%	1220	1670	73.1%	10.3%
4-Chloro-3-methylphenol	1170	1670	70.1%	1250	1670	74.9%	6.6%
2-Methylnaphthalene	1090	1670	65.3%	1210	1670	72.5%	10.4%
Hexachlorocyclopentadiene	4570	5000	91.4%	5020	5000	100%	9.4%
2,4,6-Trichlorophenol	1170	1670	70.1%	1280	1670	76.6%	9.0%
2,4,5-Trichlorophenol	1210	1670	72.5%	1330	1670	79.6%	9.4%
2-Chloronaphthalene	1160	1670	69.5%	1290	1670	77.2%	10.6%
2-Nitroaniline	1350	1670	80.8%	1440	1670	86.2%	6.5%
Dimethylphthalate	1220	1670	73.1%	1330	1670	79.6%	8.6%
Acenaphthylene	1290	1670	77.2%	1410	1670	84.4%	8.9%
3-Nitroaniline	4030	4270	94.4%	4430	4270	104%	9.5%
Acenaphthene	1160	1670	69.5%	1260	1670	75.4%	8.3%

ORGANICS ANALYSIS DATA SHEET
Semivolatiles by SW8270D GC/MS
Page 2 of 2

Sample ID: LCSD-042010
LCS/LCSD

Lab Sample ID: LCS-042010
LIMS ID: 10-9943
Matrix: Wood
Date Analyzed LCS: 04/21/10 12:30
LCSD: 04/21/10 13:02

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007

Analyte	Spike		LCS		Spike		LCSD		RPD
	LCS	Added-LCS	Recovery	LCSD	Added-LCSD	Recovery	LCSD		
2,4-Dinitrophenol	4080	5000	81.6%	5200	5000	104%	24.1%		
4-Nitrophenol	1220	1670	73.1%	1280	1670	76.6%	4.8%		
Dibenzofuran	1190	1670	71.3%	1280	1670	76.6%	7.3%		
2,6-Dinitrotoluene	1300	1670	77.8%	1370	1670	82.0%	5.2%		
2,4-Dinitrotoluene	1330	1670	79.6%	1440	1670	86.2%	7.9%		
Diethylphthalate	1250	1670	74.9%	1340	1670	80.2%	6.9%		
4-Chlorophenyl-phenylether	1180	1670	70.7%	1280	1670	76.6%	8.1%		
Fluorene	1220	1670	73.1%	1340	1670	80.2%	9.4%		
4-Nitroaniline	1110	1670	66.5%	1210	1670	72.5%	8.6%		
4,6-Dinitro-2-Methylphenol	4250	5000	85.0%	4590	5000	91.8%	7.7%		
N-Nitrosodiphenylamine	1340	1670	80.2%	1410	1670	84.4%	5.1%		
4-Bromophenyl-phenylether	1210	1670	72.5%	1280	1670	76.6%	5.6%		
Hexachlorobenzene	1190	1670	71.3%	1300	1670	77.8%	8.8%		
Pentachlorophenol	797	1670	47.7%	777	1670	46.5%	2.5%		
Phenanthrene	1260	1670	75.4%	1340	1670	80.2%	6.2%		
Carbazole	1340	1670	80.2%	1400	1670	83.8%	4.4%		
Anthracene	1310	1670	78.4%	1390	1670	83.2%	5.9%		
Di-n-Butylphthalate	1320	1670	79.0%	1400	1670	83.8%	5.9%		
Fluoranthene	1320	1670	79.0%	1380	1670	82.6%	4.4%		
Pyrene	1340	1670	80.2%	1420	1670	85.0%	5.8%		
Butylbenzylphthalate	1290	1670	77.2%	1370	1670	82.0%	6.0%		
3,3'-Dichlorobenzidine	3760	4270	88.1%	4040	4270	94.6%	7.2%		
Benzo(a)anthracene	1330	1670	79.6%	1410	1670	84.4%	5.8%		
bis(2-Ethylhexyl)phthalate	1290	1670	77.2%	1350	1670	80.8%	4.5%		
Chrysene	1350	1670	80.8%	1440	1670	86.2%	6.5%		
Di-n-Octyl phthalate	1250	1670	74.9%	1320	1670	79.0%	5.4%		
Benzo(b)fluoranthene	1260	1670	75.4%	1330	1670	79.6%	5.4%		
Benzo(k)fluoranthene	1260	1670	75.4%	1150	1670	68.9%	9.1%		
Benzo(a)pyrene	1300	1670	77.8%	1380	1670	82.6%	6.0%		
Indeno(1,2,3-cd)pyrene	1220	1670	73.1%	1290	1670	77.2%	5.6%		
Dibenz(a,h)anthracene	1240	1670	74.3%	1310	1670	78.4%	5.5%		
Benzo(g,h,i)perylene	1160	1670	69.5%	1240	1670	74.3%	6.7%		
1-Methylnaphthalene	1220	1670	73.1%	1360	1670	81.4%	10.9%		


Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	78.0%	84.0%
2-Fluorobiphenyl	77.6%	82.4%
d14-p-Terphenyl	84.4%	86.4%
d4-1,2-Dichlorobenzene	74.0%	82.4%
d5-Phenol	79.7%	86.7%
2-Fluorophenol	79.2%	88.3%
2,4,6-Tribromophenol	90.4%	94.4%
d4-2-Chlorophenol	80.8%	86.7%

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

ORGANICS ANALYSIS DATA SHEET
TCLP Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: C210-4-11
SAMPLE

Lab Sample ID: QT39B
LIMS ID: 10-9942
Matrix: TCLP Extract
Data Release Authorized: 
Reported: 04/22/10

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: 04/07/10
Date Received: 04/07/10

Date Extracted: 04/21/10
Date Analyzed: 04/21/10 19:09
Instrument/Analyst: NT6/JZ

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	Phenol	10	< 10 U
95-48-7	2-Methylphenol	10	< 10 U
106-44-5	4-Methylphenol	10	< 10 U
67-72-1	Hexachloroethane	10	< 10 U
98-95-3	Nitrobenzene	10	< 10 U
87-68-3	Hexachlorobutadiene	10	< 10 U
88-06-2	2,4,6-Trichlorophenol	50	< 50 U
95-95-4	2,4,5-Trichlorophenol	50	< 50 U
121-14-2	2,4-Dinitrotoluene	50	< 50 U
118-74-1	Hexachlorobenzene	10	< 10 U
87-86-5	Pentachlorophenol	50	< 50 U
110-86-1	Pyridine	50	< 50 U

Reported in $\mu\text{g/L}$ (ppb)


Semivolatile Surrogate Recovery

d5-Nitrobenzene	84.0%	2-Fluorobiphenyl	82.8%
d14-p-Terphenyl	81.6%	d4-1,2-Dichlorobenzene	77.6%
d5-Phenol	74.1%	2-Fluorophenol	83.5%
2,4,6-Tribromophenol	111%	d4-2-Chlorophenol	88.8%

ORGANICS ANALYSIS DATA SHEET

TCLP Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-042110
METHOD BLANK

Lab Sample ID: MB-042110
LIMS ID: 10-9942
Matrix: TCLP Extract
Data Release Authorized: 
Reported: 04/22/10

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007
Date Sampled: NA
Date Received: NA

Date Extracted: 04/21/10
Date Analyzed: 04/21/10 17:33
Instrument/Analyst: NT6/JZ

Sample Amount: 100 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
108-95-2	Phenol	10	< 10 U
95-48-7	2-Methylphenol	10	< 10 U
106-44-5	4-Methylphenol	10	< 10 U
67-72-1	Hexachloroethane	10	< 10 U
98-95-3	Nitrobenzene	10	< 10 U
87-68-3	Hexachlorobutadiene	10	< 10 U
88-06-2	2,4,6-Trichlorophenol	50	< 50 U
95-95-4	2,4,5-Trichlorophenol	50	< 50 U
121-14-2	2,4-Dinitrotoluene	50	< 50 U
118-74-1	Hexachlorobenzene	10	< 10 U
87-86-5	Pentachlorophenol	50	< 50 U
110-86-1	Pyridine	50	< 50 U

Reported in $\mu\text{g/L}$ (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	86.8%	2-Fluorobiphenyl	86.0%
d14-p-Terphenyl	89.2%	d4-1,2-Dichlorobenzene	80.4%
d5-Phenol	77.6%	2-Fluorophenol	89.9%
2,4,6-Tribromophenol	114%	d4-2-Chlorophenol	92.8%

SW8270 SEMIVOLATILES WATER SURROGATE RECOVERY SUMMARY

Matrix: TCLP Extract

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT	OUT
MB-042110	86.8%	86.0%	89.2%	80.4%	77.6%	89.9%	114%	92.8%	0	
LCS-042110	87.6%	85.6%	84.4%	81.2%	78.9%	88.5%	108%	92.3%	0	
LCSD-042110	88.8%	86.8%	84.8%	80.8%	82.4%	87.7%	107%	89.3%	0	
C210-4-11	84.0%	82.8%	81.6%	77.6%	74.1%	83.5%	111%	88.8%	0	

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DCB) = d4-1,2-Dichlorobenzene	(30-160)	(30-160)
(PHL) = d5-Phenol	(30-160)	(30-160)
(2FP) = 2-Fluorophenol	(30-160)	(30-160)
(TBP) = 2,4,6-Tribromophenol	(30-160)	(30-160)
(2CP) = d4-2-Chlorophenol	(30-160)	(30-160)

Prep Method: SW3510C
Log Number Range: 10-9942 to 10-9942

ORGANICS ANALYSIS DATA SHEET

TCLP Semivolatiles by SW8270D GC/MS

Page 1 of 1

Sample ID: LCS-042110

LCS/LCSD

Lab Sample ID: LCS-042110

LIMS ID: 10-9942

Matrix: TCLP Extract

Data Release Authorized:

Reported: 04/22/10

QC Report No: QT39-The Boeing Company

Project: Boeing Renton Airport

8888.007

Date Sampled: 04/07/10

Date Received: 04/07/10

Date Extracted LCS/LCSD: 04/21/10

Sample Amount LCS: 100 mL

LCSD: 100 mL

Date Analyzed LCS: 04/21/10 18:05

Final Extract Volume LCS: 1.0 mL

LCSD: 04/21/10 18:37

LCSD: 1.0 mL

Instrument/Analyst LCS: NT6/JZ

Dilution Factor LCS: 1.00

LCSD: NT6/JZ

LCSD: 1.00

GPC Cleanup: NO

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	171	250	68.4%	172	250	68.8%	0.6%
2-Methylphenol	199	250	79.6%	201	250	80.4%	1.0%
4-Methylphenol	405	500	81.0%	406	500	81.2%	0.2%
Hexachloroethane	178	250	71.2%	176	250	70.4%	1.1%
Nitrobenzene	328	250	131%	335	250	134%	2.1%
Hexachlorobutadiene	172	250	68.8%	176	250	70.4%	2.3%
2,4,6-Trichlorophenol	211	250	84.4%	211	250	84.4%	0.0%
2,4,5-Trichlorophenol	218	250	87.2%	222	250	88.8%	1.8%
2,4-Dinitrotoluene	228	250	91.2%	233	250	93.2%	2.2%
Hexachlorobenzene	204	250	81.6%	206	250	82.4%	1.0%
Pentachlorophenol	190	250	76.0%	175	250	70.0%	8.2%
Pyridine	155	250	62.0%	188	250	75.2%	19.2%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	87.6%	88.8%
2-Fluorobiphenyl	85.6%	86.8%
d14-p-Terphenyl	84.4%	84.8%
d4-1,2-Dichlorobenzene	81.2%	80.8%
d5-Phenol	78.9%	82.4%
2-Fluorophenol	88.5%	87.7%
2,4,6-Tribromophenol	108%	107%
d4-2-Chlorophenol	92.3%	89.3%

Results reported in $\mu\text{g/L}$

RPD calculated using sample concentrations per SW846.

ORGANICS ANALYSIS DATA SHEET
 TOTAL DIESEL RANGE HYDROCARBONS
 NWTPHD by GC/FID
 Page 1 of 1
 Matrix: Wood



QC Report No: QT39-The Boeing Company
 Project: Boeing Renton Airport
 8888.007
 Date Received: 04/07/10

Data Release Authorized: *VTS*
 Reported: 04/23/10

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	RL	Result
MB-042010 10-9943	Method Blank HC ID: ---	04/20/10	04/22/10 FID4B	1.00 1.0	Diesel Motor Oil Creosote o-Terphenyl	5.0 10 10	< 5.0 U < 10 U < 10 U 76.7%
QT39C 10-9943	C210-4-11 HC ID: DIESEL	04/20/10	04/22/10 FID4B	1.00 50	Diesel Motor Oil Creosote o-Terphenyl	830 1,700 1,700	12,000 < 1,700 U 72,000 D

Reported in mg/kg (ppm)

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

Diesel quantitation on total peaks in the range from C12 to C24.
 Motor Oil quantitation on total peaks in the range from C24 to C38.
 Creosote quantitation on total peaks in the range from C12 to C22.
 HC ID: DRO/RRO indicates results of organics or additional hydrocarbons in ranges are not identifiable.

Analytical Resources Inc.
407S TPH Quantitation Report

mu/11

Data file: /chem3/fid4b.i/20100422.b/0422b010.d
Method: /chem3/fid4b.i/20100422.b/ftphfid4b.m
Instrument: fid4b.i
Operator: MS
Report Date: 04/22/2010
Macro: 20-APR-2010

ARI ID: QT39MBS1
Client ID: QT39MBS1
Injection: 22-APR-2010 16:36
Dilution Factor: 1

FID:4B RESULTS

Compound	RT	Shift	Height	Area	Range	Total Area	Conc
Toluene	2.566	-0.010	1113	2720	GAS (Tol-C12)	89085	8
C8	2.855	0.001	612	1425	DIESEL (C12-C24)	39370	3
C10	4.016	-0.015	497	810	M.OIL (C24-C38)	74274	8
C12	4.946	0.033	338	372	AK-102 (C10-C25)	61916	4
C14	5.627	-0.009	202	317	AK-103 (C25-C36)	55647	7
C16	6.276	-0.003	237	359	OR.DIES (C10-C28)	70671	7
C18	6.872	-0.013	742	773	OR.MOIL (C28-C40)	87027	10
C20	7.461	-0.008	190	276			
C22	8.007	-0.010	1016	883			
C24	8.532	0.003	57	67			
C25	8.792	0.014	57	29			
C26	9.017	-0.008	39	24			
C28	9.525	-0.005	2269	2512			
C32	10.553	-0.010	361	807			
C34	11.076	0.001	331	217	CREOSOT (C12-C22)	36757	18
Filter Peak	13.944	0.010	2865	3702	HYDRAUL (C24-C38)	74274	7
C36	11.578	0.006	437	705			
C38	12.065	0.009	664	1042			
C40	12.519	0.000	945	1138			
o-terph	7.054	-0.002	653934	591542	JET-A (C10-C18)	46809	5
Triacon Surr	10.058	-0.001	556333	611042			

Range Times: NW Diesel(4.913 - 8.529) AK102(4.03 - 8.78) Jet A(4.03 - 6.89)
NW M.Oil(8.53 - 12.06) AK103(8.78 - 11.57) OR Diesel(4.03 - 9.53)

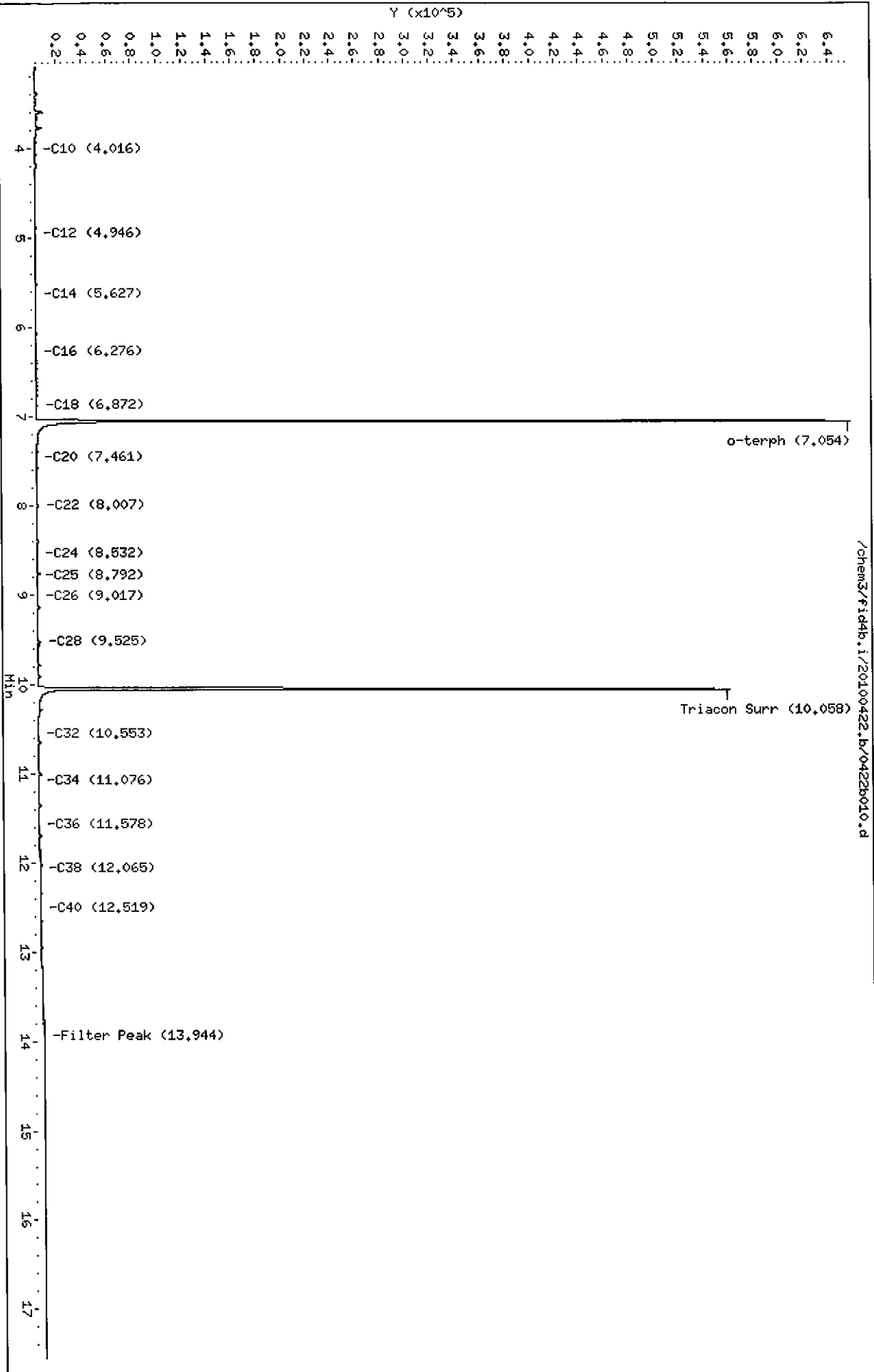
Surrogate	Area	Amount	%Rec
o-Terphenyl	591542	34.5	76.7
Triacontane	611042	42.0	93.3

Analyte	RF	Curve Date
o-Terph Surr	17144.6	20-APR-2010
Triacon Surr	14558.4	31-MAR-2010
Gas	11303.7	22-FEB-2010
Diesel	13782.0	20-APR-2010
Motor Oil	9323.0	30-MAR-2010
AK102	15339.0	20-APR-2010
AK103	8079.9	10-DEC-2009
JetA	8703.3	11-JAN-2010
OR Diesel	10525.0	
OR M.Oil	8574.0	
Creosote	2028.3	21-JAN-2009
Hydraulic	11288.8	11-JAN-2010

Data File: /chem3/fid4b.i/20100422.br/0422br010.d
Date: 22-APR-2010 16:36
Client ID: QT39MBS1
Sample Info: QT39MBS1

Column phase: RTX-1

Instrument: fid4b.i
Operator: MS
Column diameter: 0.25



TPHD SURROGATE RECOVERY SUMMARY

Matrix: Wood

QC Report No: QT39-The Boeing Company
Project: Boeing Renton Airport
8888.007

<u>Client ID</u>	<u>OTER</u>	<u>TOT OUT</u>
042010MBS	76.7%	0
042010LCS	79.7%	0
042010LCSD	81.4%	0
C210-4-11	D	0

	<u>LCS/MB LIMITS</u>	<u>QC LIMITS</u>
(OTER) = o-Terphenyl	(58-121)	(53-118)

Prep Method: SW3546
Log Number Range: 10-9943 to 10-9943

ORGANICS ANALYSIS DATA SHEET

NWTPHD by GC/FID

Sample ID: LCS-042010

Page 1 of 1

LCS/LCSD

Lab Sample ID: LCS-042010

QC Report No: QT39-The Boeing Company

LIMS ID: 10-9943

Project: Boeing Renton Airport

Matrix: Wood

8888.007

Data Release Authorized: *VTS*

Date Sampled: NA

Reported: 04/23/10

Date Received: NA

Date Extracted LCS/LCSD: 04/20/10

Sample Amount LCS: 10.0 g

LCSD: 10.0 g

Date Analyzed LCS: 04/22/10 15:46

Final Extract Volume LCS: 1.0 mL

LCSD: 04/22/10 16:11

LCSD: 1.0 mL

Instrument/Analyst LCS: FID4B/MS

Dilution Factor LCS: 1.00

LCSD: FID4B/MS

LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	120	150	80.0%	117	150	78.0%	2.5%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	79.7%	81.4%

Results reported in mg/kg

RPD calculated using sample concentrations per SW846.

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Wood
Date Received: 04/07/10

ARI Job: QT39
Project: Boeing Renton Airport
8888.007

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
10-9943-042010MB1	Method Blank	10.0 g	1.00 mL	-	04/20/10
10-9943-042010LCS1	Lab Control	10.0 g	1.00 mL	-	04/20/10
10-9943-042010LCSD1	Lab Control Dup	10.0 g	1.00 mL	-	04/20/10
10-9943-QT39C	C210-4-11	3.01 g	1.00 mL	W	04/20/10

Basis: D=Dry Weight W=As Received
Diesel Extraction Report



Analytical Resources, Incorporated

Analytical Chemists and Consultants

May 7, 2010

Dave Haddock
AMEC GeoMatrix
One Union Square
600 University Street, Suite 1020
Seattle, WA 98101

RE: Project: Boeing Renton Airport
ARI Job: QU17

Dear Mr. Haddock,

Please find enclosed a copy of the original Chain-of-Custody (COC) record, sample receipt documentation, and analytical results for the project referenced above. Analytical Resources, Inc. (ARI) accepted two solid samples in good condition on April 23, 2010. There were no discrepancies between the COC and the sample container labels. One sample was placed on hold pending further instructions.

The sample was analyzed for TCLP VOCs, as requested on the COC.

There were no anomalies associated with the sample.

Quality control analysis results are included for your review. Copies of the reports 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
www.arilabs.com

Enclosures



Cooler Receipt Form

ARI Client: Amec Geomatrix/Boeing Project Name: Boeing Renton Airport
 COC No(s): _____ (NA) Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
 Assigned ARI Job No: QU17 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)..... 15.4 _____
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90877952
 Cooler Accepted by: JR Date: 4/23/10 Time: 1040

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: AV Date: 4/23/10 Time: 1358

**** 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"
			Peabubbles → "pb"
			Large → "lg"
			Headspace → "hs"

ORGANICS ANALYSIS DATA SHEET

TCLP Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: C210-4-12
Page 1 of 1 **SAMPLE**

Lab Sample ID: QU17A

QC Report No: QU17-The Boeing Company

LIMS ID: 10-10334

Project: Boeing Renton Airport

Matrix: TCLP Ext.

8888.007

Data Release Authorized:

Date Sampled: 04/23/10

Reported: 05/06/10

Date Received: 04/23/10

Instrument/Analyst: FINN5/PAB

Sample Amount: 0.500 mL

Date Analyzed: 05/03/10 13:11

Purge Volume: 5.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	10	< 10	U
75-35-4	1,1-Dichloroethene	10	< 10	U
67-66-3	Chloroform	10	< 10	U
107-06-2	1,2-Dichloroethane	10	< 10	U
78-93-3	2-Butanone	50	< 50	U
56-23-5	Carbon Tetrachloride	10	< 10	U
79-01-6	Trichloroethene	10	< 10	U
71-43-2	Benzene	10	< 10	U
127-18-4	Tetrachloroethene	10	< 10	U
108-90-7	Chlorobenzene	10	< 10	U
106-46-7	1,4-Dichlorobenzene	10	< 10	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	108%
d8-Toluene	96.6%
Bromofluorobenzene	92.3%
d4-1,2-Dichlorobenzene	99.4%

ORGANICS ANALYSIS DATA SHEET

TCLP Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: MB-050310

Page 1 of 1

METHOD BLANK

Lab Sample ID: MB-050310


QC Report No: QU17-The Boeing Company

LIMS ID: 10-10334

Project: Boeing Renton Airport

Matrix: TCLP Ext.

8888.007

Data Release Authorized: 

Date Sampled: NA

Reported: 05/06/10

Date Received: NA

Instrument/Analyst: FINN5/PAB

Sample Amount: 5.00 mL

Date Analyzed: 05/03/10 12:33

Purge Volume: 5.0 mL

CAS Number	Analyte	RL	Result	Q
75-01-4	Vinyl Chloride	1.0	< 1.0	U
75-35-4	1,1-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
56-23-5	Carbon Tetrachloride	1.0	< 1.0	U
79-01-6	Trichloroethene	1.0	< 1.0	U
71-43-2	Benzene	1.0	< 1.0	U
127-18-4	Tetrachloroethene	1.0	< 1.0	U
108-90-7	Chlorobenzene	1.0	< 1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	< 1.0	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	103%
d8-Toluene	98.5%
Bromofluorobenzene	92.6%
d4-1,2-Dichlorobenzene	97.6%

VOA SURROGATE RECOVERY SUMMARY



Matrix: TCLP Ext.

QC Report No: QU17-The Boeing Company
 Project: Boeing Renton Airport
 8888.007

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-050310_TC	Method Blank	5	103%	98.5%	92.6%	97.6%	0
LCS-050310_TC	Lab Control	5	92.9%	95.2%	96.5%	97.8%	0
LCSD-050310_TC	Lab Control Dup	5	100%	95.0%	97.2%	97.7%	0
QU17A_TC	C210-4-12	5	108%	96.6%	92.3%	99.4%	0

LCS/MB LIMITS

QC LIMITS

SW8260C

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

83-122
 80-120
 80-120
 80-120

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

Prep Method: SW5030B
 Log Number Range: 10-10334 to 10-10334

ORGANICS ANALYSIS DATA SHEET

TCLP Volatiles by Purge & Trap GC/MS-Method SW8260C Sample ID: LCS-050310

Page 1 of 1

LAB CONTROL SAMPLE

Lab Sample ID: LCS-050310


QC Report No: QU17-The Boeing Company

LIMS ID: 10-10334

Project: Boeing Renton Airport

Matrix: TCLP Ext.

8888.007

Data Release Authorized: 

Date Sampled: NA

Reported: 05/06/10

Date Received: NA

Instrument/Analyst LCS: FINN5/PAB

Sample Amount LCS: 5.00 mL

LCSD: FINN5/PAB

LCSD: 5.00 mL

Date Analyzed LCS: 05/03/10 11:27

Purge Volume LCS: 5.0 mL

LCSD: 05/03/10 12:06

LCSD: 5.0 mL

Analyte	LCS	Spike	LCS	LCSD	Spike	LCS	RPD
		Added-LCS	Recovery		Added-LCSD	Recovery	
Vinyl Chloride	41.4	50.0	82.8%	49.8	50.0	99.6%	18.4%
1,1-Dichloroethene	39.0	50.0	78.0%	41.4	50.0	82.8%	6.0%
Chloroform	44.8	50.0	89.6%	49.6	50.0	99.2%	10.2%
1,2-Dichloroethane	45.9	50.0	91.8%	48.8	50.0	97.6%	6.1%
2-Butanone	240	250	96.0%	293	250	117%	19.9%
Carbon Tetrachloride	44.7	50.0	89.4%	49.9	50.0	99.8%	11.0%
Trichloroethene	46.2	50.0	92.4%	50.0	50.0	100%	7.9%
Benzene	47.4	50.0	94.8%	52.1	50.0	104%	9.4%
Tetrachloroethene	47.8	50.0	95.6%	49.8	50.0	99.6%	4.1%
Chlorobenzene	48.3	50.0	96.6%	51.0	50.0	102%	5.4%
1,4-Dichlorobenzene	50.7	50.0	101%	51.7	50.0	103%	2.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	92.9%	100%
d8-Toluene	95.2%	95.0%
Bromofluorobenzene	96.5%	97.2%
d4-1,2-Dichlorobenzene	97.8%	97.7%