LANDAU ASSOCIATES

April 15, 2020

Washington State Department of Ecology
Northwest Regional Office
3190 160th Ave SE
Bellevue, Washington 98008-5452

Attn: Li Ma

Transmitted via email to: *lima461@ecy.wa.gov*

Re: Status Report No. 70, January through March 2020 Activity Period
Boeing Auburn Facility
WAD 041337130, RCRA Corrective Action Agreed Order No. 01HWTRNR-3345
Auburn, Washington
Project No. 0025164.180.501

Dear Mr. Ma:

The Resource Conservation and Recovery Act (RCRA) Corrective Action Agreed Order (Auburn Agreed Order) became effective on August 14, 2002. As required under Section VI.13 of the Auburn Agreed Order, Landau Associates, Inc. (LAI) is providing Status Report No. 70 on behalf of The Boeing Company (Boeing), which covers the 3-month activity period of January through March 2020.

References

1. January 7, 2020. Letter: Renewal for Right-of-Way Use Permit 09-45, Auburn, Washington. From Sarah Fees, LAI, to Amber Price, City of Auburn.
2. January 15, 2020. Letter: Status Report No. 69, October through December 2019 Activity Period, Boeing Auburn Facility, WAD 041337130, RCRA Corrective Action Agreed Order No. 01HWTRNR-3345, Auburn, Washington. From Sarah Fees, LAI, to Li Ma, Ecology.
3. January 21, 2020. Email: RE: Communication call today? From Christa Colouzis, Ecology, to Jennifer Wynkoop, LAI.
4. January 27, 2020. Email: Boeing Fabrication Auburn Site – Status Reports 68 and 69, July – December 2019 Activity Period. From Li Ma, Ecology, to Representatives of City of Algona, City of Auburn, City of Pacific, Ecology, and Boeing.
5. January 28, 2020. Email: RE: Boeing Auburn – Follow-up on New Monitoring Well Requests. From Li Ma, Ecology, to Debbie Taege, Boeing, and Christa Colouzis, Ecology. Attachment: Responses to December 17, 2019 email from Boeing (final).
6. January 29, 2020. Email: RE: Approved Right-of-Way Use Permit for Boeing Monitoring Wells. From Amber Price, City of Auburn, to Sarah Fees, LAI.
7. January 30, 2020. Project Meeting: Modeling. Landau Associates Tacoma Office: Sarah Fees, Ben Lee, LAI; Li Ma, Ecology.

8. February 5, 2020. Email: Boeing Auburn – LNAPL Monitoring at Bldg 17-06. From Debbie Taege, Boeing, to Li Ma, Ecology.
9. February 7, 2020. Email: Boeing Auburn – LNAPL Monitoring at Building 17-06. From Li Ma, Ecology, to Debbie Taege, Boeing.
10. February 7, 2020. Email: RE: Boeing Auburn – Follow-up on New Monitoring well Requests. From Debbie Taege, Boeing, to Li Ma and Christa Colouzis, Ecology. (Attachments: EPH laboratory data packages, figure showing locations of decommissioned wells).
11. February 13, 2020. Email: Boeing Auburn – Historical Release Reporting – Building 17-07. From Debbie Taege, Boeing, to Li Ma, Ecology.
12. February 13, 2020. Email: RE: Boeing Auburn – LNAPL Monitoring at Bldg 17-06. From Li Ma, Ecology, to Debbie Taege, Boeing.
13. February 28, 2020. Email: Boeing Auburn – Historical Release Reporting Building 17-07 – Status Update. From Sarah Fees, LAI, to Li Ma, Ecology.
14. March 3, 2020. Project Meeting: Building 17-07 Site Visit: Sarah Fees and Jennifer Wynkoop, LAI; Jim Swortz, Boeing; Li Ma, Ecology.
15. March 3, 2020. File transfer: Mann-Kendall Spreadsheets for Restoration Time Frames – Boeing-Auburn Site Wide Corrective Action. From Sarah Fees, LAI, to Li Ma, Ecology.
16. March 4, 2020. Technical Memorandum: Algona Pilot Test – Second Year of Monitoring, Boeing Auburn Facility, Auburn, Washington. From Sarah Fees and Jennifer Wynkoop, LAI, to Li Ma, Ecology.
17. March 4, 2020. Letter: June 2019 Groundwater Concentration Figure Updates, Boeing Auburn Facility, Auburn, Washington. From Sarah Fees, LAI, to Li Ma, Ecology.
18. March 6, 2020. Email: RE: Boeing Auburn – Historical Release Reporting Building 17-07 – Status Update. From Li Ma, Ecology to Sarah Fees, LAI.
19. March 18, 2020. Email: Linear Regression Spreadsheets. From Sarah Fees, LAI, to Li Ma, Ecology.
20. March 20, 2020. Report: DRAFT Supplemental Feasibility Study Work Plan, Spring 2020, Boeing Auburn Facility, Auburn, Washington. Prepared by Landau Associates, Inc. for The Boeing Company.
21. March 20, 2020. File transfer: Linear Regression Spreadsheets – Part 2 – Boeing-Auburn Site Wide Corrective Action. From Sarah Fees, LAI, to Li Ma, Ecology.
22. March 24, 2020. Email: Boeing Auburn Flow Model Calibration. From Li Ma, Ecology, to Sarah Fees and Ben Lee, LAI, and Debbie Taege, Boeing.
23. March 31, 2020. Email: RE: Boeing Auburn Draft Supplemental FS Work Plan. From Li Ma, Ecology, to Sarah Fees, LAI.

Work Conducted

General Site-wide Corrective Action Activities

On January 15, 2020, LAI submitted Status Report No. 69 regarding fourth quarter 2019 activities to Ecology and other stakeholders[1] for their records (Reference #2). Ecology project manager, Li Ma, has continued to attend regularly scheduled monthly conference calls with Boeing, LAI, and the City of Algona's environmental consultant, ICF International (ICF). Boeing and Ecology communication personnel also attend these calls. The primary purpose of these calls is to provide a status update on the project schedule, reporting, and public outreach.

Boeing has access agreements with a number of off-site property owners to conduct groundwater monitoring on their property. The access agreement for the groundwater monitoring wells on City of Auburn's right-of-way (ROW) was set to expire on January 26, 2020. Boeing requested and received a 5-year permit extension allowing access to the monitoring wells through January 28, 2025 (Reference #1 and #6).

Chicago Avenue Ditch Water Sampling

Sampling occurs at one location (SW-CD4) in the Chicago Avenue ditch semiannually. Chicago Avenue ditch water sampling was completed on March 10, 2020 and the analytical data are provided in Table 1-1 of Attachment 1. The Chicago Avenue ditch sampling location, along with the annual stormwater and surface water sampling locations, are shown on Figure 1-1 of Attachment 1. The laboratory data package is provided in Attachment 2.

Building 17-07 Historical Release Reporting

In January 2020, Boeing encountered localized petroleum contamination in soil during construction activities inside Building 17-07. Construction activities are occurring to support installation of new equipment and include removal of former mill foundations and removal of concrete slab. Construction activities are occurring between columns J5/J6 to E5/E6 in Building 17-07. Localized petroleum hydrocarbon impacted soil has been identified adjacent to a number of the former mill foundations during construction activities. In accordance with the project release reporting guidelines[2], Boeing provided Ecology with written notice on February 13, 2020 (Reference #11) of a moderate release of petroleum hydrocarbons to soil associated with the former mill foundations. Construction activities are ongoing and are expected to continue through the second quarter 2020. A separate technical memorandum including information about the nature and extent of contamination and soil removal will be prepared and submitted to Ecology within 90 days of receipt of final laboratory data packages after excavation activities are completed for the project.

[1] A list of stakeholders that receive copies of the quarterly status reports are listed at the end of this document. Ecology also forwards quarterly status reports via email to representatives of the cities of Algona, Auburn, and Pacific (Reference #4).

[2] LAI. 2009. Memorandum: Boeing Auburn Facility Corrective Action Release Reporting Guidelines. To James Bet, Boeing, from Eric Weber and Jennifer Wynkoop, Landau Associates, Inc. March 5.

Due to the length of the construction activities, Boeing is providing Ecology with periodic updates to get concurrence on confirmation sampling results associated with each foundation excavation area where contaminated soil is encountered. Boeing provided Ecology with confirmation sampling data and cleanup level calculations for the soil excavation associated with Foundation 2 on February 28, 2020 (Reference #13). Li Ma requested a tour of the construction activities and this site visit was completed on March 3, 2020 (Reference #14). Ecology provided approval of excavation work, confirmation sampling locations, and completion of work at this excavation on March 6, 2020 (Reference #18).

Feasibility Study Reporting

The draft feasibility study (FS) report and report appendices were submitted to Ecology in the fourth quarter, 2019. Boeing and Ecology will continue to discuss initial Ecology comments and next steps for potential revisions to the FS report.

Boeing has been making updates to the numerical groundwater flow model and contaminant transport model based on Ecology's comments. On January 30, 2020, a project team meeting was held at Landau Associates' Tacoma office to discuss initial Ecology comments and possible updates to the flow model (Reference #7). LAI and Ecology have been meeting regularly to discuss the status of the model and review changes. Ecology provided confirmation of agreement in the flow model calibration on March 24, 2020 (Reference #22). With the flow model updates completed, Boeing is in the process of updating and calibrating the transport model. Check-in meetings with Ecology will be ongoing as updates to the transport model are completed.

Boeing has also been making updates to individual well restoration time-frame estimates based on Ecology's comments. On March 3, 2020, Mann-Kendall trend analysis spreadsheets were provided to Ecology for review (Reference #15). Linear regression spreadsheets with a statistical analysis of data for applicable monitoring wells were submitted to Ecology on March 18 and 20, 2020 (References #19 and #21). The March 20, 2020 submittal also included an updated summary spreadsheet with individual well point attenuation rates and restoration time frames (Reference #21).

Additional Feasibility Study Investigation

Ecology, in its response letters for Boeing's Building 17-06 and Former Building 17-03 FS data submittals, requested installation of four additional monitoring wells. In the fourth quarter 2019, based on the results of the FS evaluation, Boeing requested Ecology concurrence that the monitoring wells at Building 17-06 were no longer required and that installation of any needed monitoring wells in the Former Building 17-03 area would be delayed until a determination for cleanup of the site-wide groundwater volatile organic compound contamination was completed. On January 28, 2020, Ecology provided a letter response requesting additional information and requesting additional FS investigation activities be completed as soon as possible (Reference #5). Boeing provided an email response providing the additional information requested by Ecology and agreeing to additional

investigation activities on February 7, 2020 (Reference #10). These additional investigation activities include installation of one monitoring well and one soil boring east of Building 17-06, and one continuous multi-channel tubing (CMT) monitoring well in the Former Building 17-03 release area. Boeing prepared a draft supplemental FS work plan, which was submitted to Ecology for review on March 20, 2020 (Reference #20). The FS work plan was approved by Ecology on March 31, 2020 (Reference #23). The final version of the work plan will be sent out in early April. Investigation activities are expected to occur in spring of 2020.

Other Reporting

A draft technical memorandum summarizing the results from the second year of pilot test monitoring was submitted to Ecology in the fourth quarter 2018. Boeing did not receive comments from Ecology on this technical memorandum and therefore finalized and submitted the document to Ecology on March 4, 2020 (Reference #16).

Boeing updated a number of figures with data from the June 2019 annual groundwater sampling event. Updated figures included groundwater concentrations contours and the northern residential Algona vapor intrusion assessment. These figures were provided to Ecology in a letter on March 4, 2020 (Reference #17).

Communications

Ecology and Boeing are working together to ensure that all stakeholders are aware of the progress of investigation and cleanup activities at the Boeing Auburn Site. The City of Algona continues to be notified of all fieldwork occurring in Algona. The City of Algona's consultant, ICF, continues to participate in project conference calls with Boeing and Ecology and continues to review Algona-related deliverables (e.g., work plans and reports). Boeing and Ecology also continue to update the City of Auburn on activities periodically.

Building 17-06 Ongoing Monitoring

Boeing has been performing monthly monitoring for petroleum hydrocarbons in monitoring wells AGW128, AGW277, and AGW281 located in Building 17-06. Boeing requested that monitoring be adjusted from monthly to semiannually on February 5, 2020 (Reference #8). Ecology approved the reduced frequency of monitoring on February 7, 2020 (Reference #9). Boeing and Ecology discussed when this semiannual monitoring should take place and agreed on monitoring in June, along with annual groundwater monitoring activities, and in September, the end of the dry season (Reference #12).

Occurrence of Problems

None to report.

Projected Work for Next Reporting Period April through June 2020

Activities projected for the next reporting period pertain to FS investigations and reporting, ongoing groundwater monitoring, and activities associated with historical release reporting at Building 17-07, and supplemental FS field investigations. Tasks during second quarter 2020 are expected to include:

- Continuing to discuss Ecology comments of the draft FS report. Boeing and Ecology will have additional meetings to discuss suggested revisions to the FS report.
- Continue making updates to the contaminant transport model.
- Oversight of excavation activities in Building 17-07 and conducting investigation activities associated with historical release reporting.
- Finalizing the supplemental FS work plan and completing additional investigation activities.
- Conducting annual groundwater monitoring including semiannual LNAPL monitoring in Building 17-06.

Other Significant Findings, Changes, and Contacts

Former Ecology corrective action outreach specialist, Thea Levkovitz, retired in January 2020 (Reference #3). Janelle Anderson has replaced Thea as the Ecology community outreach specialist for the Boeing Auburn project.

If you have any questions regarding this status report, or need any other information, please do not hesitate to contact Boeing or LAI.

LANDAU ASSOCIATES, INC.

Sarah Fees

Sarah Fees, LG
Associate Geologist

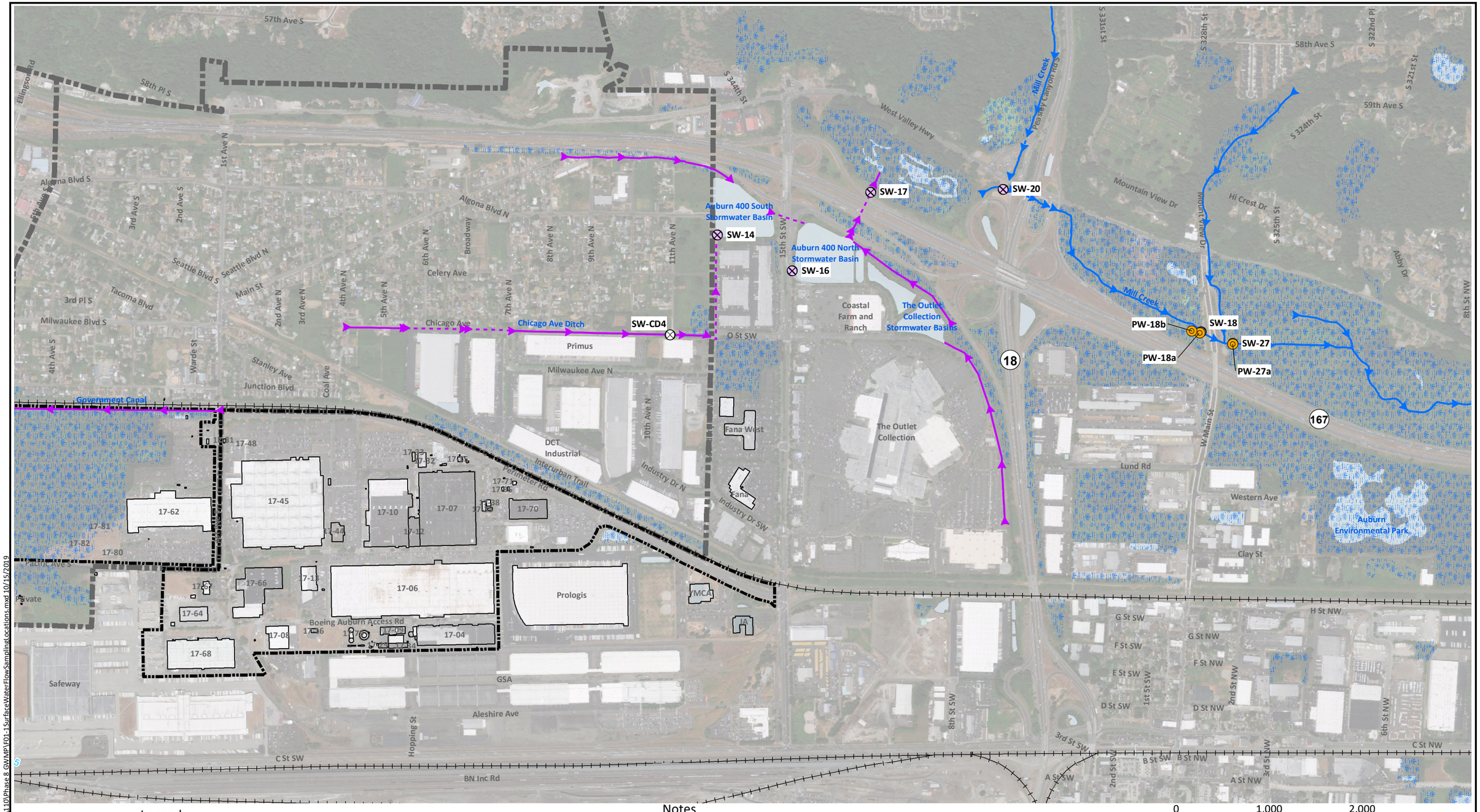
KMG/SEF/kjg
[Y:\025\164\R\QUARTERLY PROGRESS RPTS\2020\1Q2020\1Q2020 STATUS RPT NO. 70 LETTER RPT_DRAFT.DOCX

cc: Debbie Taege (email only)
Thomas MacMannis, Boeing (email only)
Kamara Sams, Boeing (email only)
James Swortz, Boeing (email only)
Kathryn Moxley, Boeing (email only)
Patrick McCabe, Boeing Realty (email only)
Janet Frentzel, Prologis (email only)
Kim Lemon, Prologis (email only)
Brett Richer, Prologis (email only)
Steve Campbell, Prologis (email only)
Jason Berry, YMCA Auburn (email only)
Christa Colouzis, Ecology (email only)

Attachments: Attachment 1: Chicago Avenue Ditch Water Sampling Results
Attachment 2: Laboratory Data Package

ATTACHMENT 1

Chicago Avenue Ditch Water Sampling Results



G:\Project\a\025\164\150\110\Phase B GWMP\F01-1SurfaceWaterFlowSamplingLocations.mxd 10/15/2019

Legend

- Annual Stormwater/Surface Water Sample Location
- Semiannual Stormwater/Surface Water Sampling Location
- Annual Pore Water Sample Location
- Boeing Property
- City Limits
- Wetland Areas
- Open Surface Water Waterway
- Open Stormwater Waterway
- Piped Surface Water Waterway
- Piped Stormwater Waterway

Notes

1. Stormwater/surface water sampling locations are designated by SW. Pore water sampling locations are designated by PW.
2. The locations of surface water features are approximate.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 1,000 2,000

Scale in Feet

Base Map Source: Geometrix 2003; Parcel Data Source: King County 2015; Aerial Photo Source: Esri World Imagery.

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Boeing Auburn Remedial Investigation Auburn, Washington	**Stormwater and Surface Water Features and Pore Water Sampling Locations**	Figure 1-1

Table 1-1
1Q2020 Stormwater Feature Analytical Results
Boeing Auburn Facility
Auburn, Washington

Sample Location:	Laboratory SDG:	Sample Date:	Sample Type:	Select VOCs by SW-846 8260C (µg/L)					
				1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	trans-1,2-Dichloroethene	Trichloroethene	Vinyl Chloride
SW-CD4	20C0122	3/10/2020	N	0.200 U	**0.711**	0.200 U	0.200 U	**0.663**	**0.194**
SW-CD4	20C0122	3/10/2020	FD	0.200 U	**0.649**	0.200 U	0.200 U	**0.584**	**0.187**

Notes:

Bold text indicates detected analyte.

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Abbreviations/Acronyms:

FD = field duplicate

SDG = sample delivery group

µg/L = micrograms per liter

N = primary sample

ATTACHMENT 2

Laboratory Data Package

Analytical Resources, Incorporated
Analytical Chemists and Consultants

12 March 2020

Debbie Taege
The Boeing Company
Bldg 10-20, MC 9U4-26
Renton, WA 98055-1409

RE: Boeing Auburn 1Q SW Sampling

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
20C0122	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

2000122

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Chain-of-Custody Record

☐ **Seattle/Edmonds** (425) 778-0907 ☒ **Tacoma** (253) 926-2493 ☐ **Spokane** (509) 327-9737 ☐ **Portland** (503) 542-1080 ☐

Date 3/10/20

Page 1 of 1

Turnaround Time: (Standard) / Accelerated

Project Name Boeing Auburn Project No. 0025764.180.101

Project Location/Event Auburn, WA / 1Q SW Sampling

Sampler's Name Katie Gauglitz

Project Contact S. Fees, D. Taege

Send Results To D. Jorgensen, S. Fees, (and others, see LIMS list)

Testing Parameters: Boeing 6 VOCs 8260C SIM; MS/MSD

4.6

Special Handling Requirements:

Shipment Method:

Stored on ice: (Yes) / No

Sample I.D.	Date	Time	Matrix	No. of Containers	Boeing 6 VOCs 8260C SIM	MS/MSD
TripBlank-20200310	—	—	Aq	3	X	
SW-CD4-20200310	3/10/20	1045	Aq	9	X	X
SW-900-20200310	3/10/20	1047	Aq	3	X	

Observations/Comments

__ Allow water samples to settle, collect aliquot from clear portion ☐

__ NWTPH-Dx - Acid wash cleanup ☐
- Silica gel cleanup ☐

__ Dissolved metal samples were field filtered

Other

Relinquished by	Received by	Relinquished by	Received by
Signature Katie M. Gauglitz	Signature [signature]	Signature	Signature
Printed Name Katie Gauglitz	Printed Name Erin Salle	Printed Name	Printed Name
Company Landau Associates	Company ARI	Company	Company
Date 3/10/20 Time 11:15	Date 3/10/2020 Time 1145	Date Time	Date Time

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

The Boeing Company	Project: Boeing Auburn 1Q SW Sampling	
Bldg 10-20, MC 9U4-26	Project Number: 0025764.180.101	**Reported:**
Renton WA, 98055-1409	Project Manager: Debbie Taege	12-Mar-2020 13:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
TripBlank-20200310	20C0122-01	Water	10-Mar-2020 10:45	10-Mar-2020 11:45
SW-CD4-20200310	20C0122-02	Water	10-Mar-2020 10:45	10-Mar-2020 11:45
SW-900-20200310	20C0122-03	Water	10-Mar-2020 10:47	10-Mar-2020 11:45

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

The Boeing Company	Project: Boeing Auburn 1Q SW Sampling	
Bldg 10-20, MC 9U4-26	Project Number: 0025764.180.101	**Reported:**
Renton WA, 98055-1409	Project Manager: Debbie Taege	12-Mar-2020 13:06

Work Order Case Narrative

Volatiles - EPA Method 8260C-SIM (Selected Ion Monitoring)

The sample(s) were analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS percent recoveries were within control limits.

The matrix spike/matrix spike duplicate recoveries and RPD were within limits with the exception of analytes flagged on the associated forms.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Boeing Auburn
Project Name: IQ SW Sampling
COC No(s): _____ NA
Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____
Assigned ARI Job No: 20C022
Tracking No: _____ NA

Preliminary Examination Phase:

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

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

Time 1245 4.6

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DOO 2565

Cooler Accepted by: _____ Date: 3/10/2020 Time: 1145

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ...	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	2/26/2020	

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: _____ Date: 3/10/2020 Time: 1415 Labels checked by: JB

JB

** ***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:

The Boeing Company	Project: Boeing Auburn 1Q SW Sampling	
Bldg 10-20, MC 9U4-26	Project Number: 0025764.180.101	**Reported:**
Renton WA, 98055-1409	Project Manager: Debbie Taege	12-Mar-2020 13:06

TripBlank-20200310

20C0122-01 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM — Sampled: 03/10/2020 10:45
Instrument: NT16 Analyst: PB — Analyzed: 03/11/2020 15:05

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 20C0122-01 A
Preparation Batch: BIC0212 — Sample Size: 10 mL
Prepared: 03/11/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.200	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.200	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.200	ND	ug/L	U
Trichloroethene	79-01-6	1	0.200	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.200	ND	ug/L	U

Surrogate	*Recovery Limits*	*Recovery*	*Units*	*Notes*
1,2-Dichloroethane-d4	*80-129 %*	*83.7*	*%*	
Toluene-d8	*80-120 %*	*91.0*	*%*	
4-Bromofluorobenzene	*75-125 %*	*95.6*	*%*	

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The Boeing Company	Project: Boeing Auburn 1Q SW Sampling	
Bldg 10-20, MC 9U4-26	Project Number: 0025764.180.101	**Reported:**
Renton WA, 98055-1409	Project Manager: Debbie Taege	12-Mar-2020 13:06

SW-CD4-20200310

20C0122-02 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM
Instrument: NT16 Analyst: PB

Sampled: 03/10/2020 10:45
Analyzed: 03/11/2020 20:49

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BIC0212
Prepared: 03/11/2020
Sample Size: 10 mL
Final Volume: 10 mL

Extract ID: 20C0122-02 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	**0.194**	ug/L	
1,1-Dichloroethene	75-35-4	1	0.200	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.200	**0.711**	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.200	ND	ug/L	U
Trichloroethene	79-01-6	1	0.200	**0.663**	ug/L	
Tetrachloroethene	127-18-4	1	0.200	ND	ug/L	U

Surrogate	*Recovery Limits*	*Recovery*	*Units*	*Notes*
1,2-Dichloroethane-d4	*80-129 %*	*85.2*	*%*	
Toluene-d8	*80-120 %*	*92.6*	*%*	
4-Bromofluorobenzene	*75-125 %*	*97.1*	*%*	

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The Boeing Company	Project: Boeing Auburn 1Q SW Sampling	
Bldg 10-20, MC 9U4-26	Project Number: 0025764.180.101	**Reported:**
Renton WA, 98055-1409	Project Manager: Debbie Taege	12-Mar-2020 13:06

SW-900-20200310

20C0122-03 (Water)

Volatile Organic Compounds - SIM

Method: EPA 8260C-SIM — Sampled: 03/10/2020 10:47

Instrument: NT16 Analyst: PB — Analyzed: 03/11/2020 21:09

Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap) — Extract ID: 20C0122-03 A

Preparation Batch: BIC0212 — Sample Size: 10 mL

Prepared: 03/11/2020 — Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Vinyl chloride	75-01-4	1	0.0200	**0.187**	ug/L	
1,1-Dichloroethene	75-35-4	1	0.200	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.200	**0.649**	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.200	ND	ug/L	U
Trichloroethene	79-01-6	1	0.200	**0.584**	ug/L	
Tetrachloroethene	127-18-4	1	0.200	ND	ug/L	U

Surrogate	*Recovery Limits*	*Recovery*	*Units*	*Notes*
1,2-Dichloroethane-d4	*80-129 %*	*87.1*	*%*	
Toluene-d8	*80-120 %*	*91.1*	*%*	
4-Bromofluorobenzene	*75-125 %*	*96.9*	*%*	

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The Boeing Company	Project: Boeing Auburn 1Q SW Sampling	
Bldg 10-20, MC 9U4-26	Project Number: 0025764.180.101	**Reported:**
Renton WA, 98055-1409	Project Manager: Debbie Taege	12-Mar-2020 13:06

Volatile Organic Compounds - SIM - Quality Control

Batch BIC0212 - EPA 5030 (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BIC0212-BLK1)				Prepared: 11-Mar-2020 Analyzed: 11-Mar-2020 13:24						
Vinyl chloride	ND	0.0200	ug/L							U
1,1-Dichloroethene	ND	0.200	ug/L							U
cis-1,2-Dichloroethene	ND	0.200	ug/L							U
trans-1,2-Dichloroethene	ND	0.200	ug/L							U
Trichloroethene	ND	0.200	ug/L							U
Tetrachloroethene	ND	0.200	ug/L							U
Surrogate: 1,2-Dichloroethane-d4	4250		ug/L	*5000*		*84.9*	*80-129*			
Surrogate: Toluene-d8	4530		ug/L	*5000*		*90.6*	*80-120*			
Surrogate: 4-Bromofluorobenzene	4790		ug/L	*5000*		*95.7*	*75-125*			
LCS (BIC0212-BS1)				Prepared: 11-Mar-2020 Analyzed: 11-Mar-2020 11:24						
Vinyl chloride	2.32	0.0200	ug/L	2.00		116	76-120			
1,1-Dichloroethene	2.14	0.200	ug/L	2.00		107	80-120			
cis-1,2-Dichloroethene	2.14	0.200	ug/L	2.00		107	80-120			
trans-1,2-Dichloroethene	2.12	0.200	ug/L	2.00		106	80-120			
Trichloroethene	2.02	0.200	ug/L	2.00		101	80-120			
Tetrachloroethene	1.95	0.200	ug/L	2.00		97.3	80-122			
Surrogate: 1,2-Dichloroethane-d4	4580		ug/L	*5000*		*91.5*	*80-129*			
Surrogate: Toluene-d8	4690		ug/L	*5000*		*93.8*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5050		ug/L	*5000*		*101*	*75-125*			
LCS Dup (BIC0212-BSD1)				Prepared: 11-Mar-2020 Analyzed: 11-Mar-2020 13:04						
Vinyl chloride	2.10	0.0200	ug/L	2.00		105	76-120	10.30	30	
1,1-Dichloroethene	1.93	0.200	ug/L	2.00		96.6	80-120	10.20	30	
cis-1,2-Dichloroethene	1.89	0.200	ug/L	2.00		94.4	80-120	12.60	30	
trans-1,2-Dichloroethene	1.89	0.200	ug/L	2.00		94.5	80-120	11.30	30	
Trichloroethene	1.92	0.200	ug/L	2.00		95.9	80-120	5.08	30	
Tetrachloroethene	1.88	0.200	ug/L	2.00		94.0	80-122	3.42	30	
Surrogate: 1,2-Dichloroethane-d4	4110		ug/L	*5000*		*82.2*	*80-129*			
Surrogate: Toluene-d8	4720		ug/L	*5000*		*94.4*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5060		ug/L	*5000*		*101*	*75-125*			
Matrix Spike (BIC0212-MS1)	**Source: 20C0122-02**			Prepared: 11-Mar-2020 Analyzed: 11-Mar-2020 21:30						
Vinyl chloride	2.68	0.0200	ug/L	2.00	0.194	124	76-120			*

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Volatile Organic Compounds - SIM - Quality Control

Batch BIC0212 - EPA 5030 (Purge and Trap)

Instrument: NT16 Analyst: PB

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike (BIC0212-MS1)	**Source: 20C0122-02**		Prepared: 11-Mar-2020 Analyzed: 11-Mar-2020 21:30							
1,1-Dichloroethene	2.31	0.200	ug/L	2.00	ND	115	80-120			
cis-1,2-Dichloroethene	3.03	0.200	ug/L	2.00	0.711	116	80-120			
trans-1,2-Dichloroethene	2.33	0.200	ug/L	2.00	ND	113	80-120			
Trichloroethene	2.81	0.200	ug/L	2.00	0.663	108	80-120			
Tetrachloroethene	2.11	0.200	ug/L	2.00	ND	105	80-122			
Surrogate: 1,2-Dichloroethane-d4	4550		ug/L	*5000*	*4260*	*91.0*	*80-129*			
Surrogate: Toluene-d8	4700		ug/L	*5000*	*4630*	*94.1*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5120		ug/L	*5000*	*4860*	*102*	*75-125*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Matrix Spike Dup (BIC0212-MSD1)	**Source: 20C0122-02**		Prepared: 11-Mar-2020 Analyzed: 11-Mar-2020 21:50							
Vinyl chloride	2.39	0.0200	ug/L	2.00	0.194	110	76-120	11.40	30	
1,1-Dichloroethene	2.06	0.200	ug/L	2.00	ND	103	80-120	11.10	30	
cis-1,2-Dichloroethene	2.71	0.200	ug/L	2.00	0.711	100	80-120	10.80	30	
trans-1,2-Dichloroethene	2.10	0.200	ug/L	2.00	ND	101	80-120	10.70	30	
Trichloroethene	2.56	0.200	ug/L	2.00	0.663	94.6	80-120	9.64	30	
Tetrachloroethene	1.91	0.200	ug/L	2.00	ND	94.8	80-122	9.82	30	
Surrogate: 1,2-Dichloroethane-d4	4480		ug/L	*5000*	*4260*	*89.7*	*80-129*			
Surrogate: Toluene-d8	4720		ug/L	*5000*	*4630*	*94.3*	*80-120*			
Surrogate: 4-Bromofluorobenzene	5170		ug/L	*5000*	*4860*	*103*	*75-125*			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

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Certified Analyses included in this Report

Analyte	Certifications
EPA 8260C-SIM in Water	
Acrylonitrile	NELAP,CALAP,WADOE
Vinyl chloride	NELAP,CALAP,WADOE
1,1-Dichloroethene	NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	NELAP,CALAP,WADOE
Trichloroethene	NELAP,CALAP,WADOE
Tetrachloroethene	NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	NELAP,CALAP,WADOE
1,2-Dichloroethane	NELAP,CALAP,WADOE
Benzene	NELAP,CALAP,WADOE

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2020
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Notes and Definitions

*	Flagged value is not within established control limits.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.