Final SVE Optimization Report
Former Vapor Degreaser Source Area
Boeing Portland Troutdale Gravel Aquifer
Gresham, Oregon

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Prepared for

The Boeing Company

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LIST OF ABBREVIATIONS AND ACRONYMS

µg/kg ..... micrograms per kilogram
µg/m^3 ..... micrograms per cubic meter
1,1-DCE 1,1-dichloroethene
AFCEE ..... Air Force Center for Environmental Excellence
bgs ..... below ground surface
Boeing ..... The Boeing Company
cDCE cis-1,2-dichloroethene
ELLE ..... Eurofins Lancaster Laboratory Environmental
EPA ..... US Environmental Protection Agency
ft ..... feet, foot
FVDSA ..... former vapor degreaser source area
LAI ..... Landau Associates, Inc.
ODEQ ..... Oregon Department of Environmental Quality
OMM ..... operations, maintenance, and management
Order ..... Order on Consent
PCE ..... tetrachloroethene
PID ..... photoionization detector
RBC ..... risk-based concentration
SAP ..... sampling and analysis plan
SCFM ..... standard cubic feet per minute
SVE ..... soil vapor extraction
TCA 1,1,1-trichloroethane
TCE ..... trichloroethene
TGA ..... Troutdale Gravel Aquifer
VC ..... vinyl chloride
VOC ..... volatile organic compound
work plan ..... Shallow Subsurface Investigation Work Plan

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1.0 INTRODUCTION

This document presents the results of a subsurface investigation, conducted by Landau Associates, Inc. (LAI), of shallow subsurface soil vapor distribution associated with the former vapor degreasers within Building 85-001 at The Boeing Company's (Boeing's) Portland facility (facility; Figure 1). The soil vapor investigation was performed to determine the location of residual volatile organic compounds (VOCs; primarily trichloroethene [TCE]) in soil in the Former Vapor Degreaser Source Area (FVDSA). The purpose of obtaining this information was to evaluate optimization options for the soil vapor extraction (SVE) system, which was installed at the facility in September 2012. In the 2019 Annual Progress report, it was recommended that an additional investigation of shallow soil vapor be conducted to better delineate the distribution of TCE and identify the cause(s) of rebounding vapor concentrations in the sub-slab interval observed during the temporary shutdown of the SVE system in 2018 (LAI 2020a). Proposed sampling and procedures for the shallow subsurface investigation were presented in the Shallow Subsurface Investigation Work Plan (work plan; LAI 2020b). This investigation and associated monitoring activities were conducted under the Oregon Department of Environmental Quality (ODEQ) Order on Consent (Order) DEQ No. LWSR-NWR-04-12.

1.1 Background

This section presents a short summary of background information on the Troutdale Gravel Aquifer (TGA) that underlies the facility and the SVE system in Building 85-001 that is operated to address TCE-contaminated soil vapor in the TGA.

1.1.1 Historical Work in Building 85-001

Historical releases of TCE from former vapor degreasers inside Building 85-001 were the primary source of TCE contamination found in the subsurface beneath the building. Prior to 2009, the FVDSA was inaccessible for soil and groundwater investigations because of limited access for drilling inside the active manufacturing building and difficult geologic conditions (dense to very dense soil with cobbles and boulders). With advancement in limited-access rotosonic drilling technologies, three investigations were conducted within the FVDSA between 2009 and 2011 (LAI 2010, 2011a, 2012a). Between late-2009 and mid-2011, several rounds of soil vapor sampling were conducted at a total of 56 temporary sub-slab locations. By early January 2012, seven multiple-purpose wells (BOP-78[i], BOP-79[i], and BOP-84[i] through BOP-88[i]) were installed within the FVDSA with separate well screens in the unsaturated and saturated zones of the TGA. The multi-purpose wells are currently utilized for SVE operation (system installation in September 2012), groundwater quality monitoring, and *in situ* bioremediation injections. Three vapor observation wells (VOW-16 through VOW-18) were also installed in 2012, which are screened from about 5 to 45 feet (ft) below ground surface (bgs), within the vadose zone to monitor at-depth vapor concentrations (Figure 2). In April 2013, nine permanent sub-slab vapor points (VP-1 through VP-9) were installed in the FVDSA based on previous temporary sub-slab investigation locations and TCE concentrations (Figure 2; LAI 2013). The

permanent sub-slab vapor points were installed to monitor shallow soil vapor impacts and to evaluate the SVE system.

1.1.2 Soil Vapor Extraction System

The SVE system operated on a full-time basis from September 2012 through 2014. To monitor the performance of the SVE system, routine soil vapor samples are collected immediately below the building's concrete slab, which is approximately 6–9 inches thick, and at-depth samples are collected from the multiple-purpose and vapor observation wells (Figure 2). In 2014, operation of the SVE system was switched from full-time to a pulsing approach, which consists of periodic shutdowns to the entire system. The longest SVE system shutdown during pulsed operation occurred from October 31, 2017 through August 20, 2018. During periods where the SVE system was operating full-time, vapor samples indicated that concentrations were consistently below the TCE screening level (2,900 micrograms per cubic meter [µg/m^3]) protective of occupational receptors in buildings with vapor intrusion. Samples collected on August 10, 2018 (during the extended shutdown period) indicated TCE concentration rebound in three of the nine sub-slab soil vapor points to levels above the TCE screening level. Once the system turned back on, concentrations returned to levels below the TCE screening level.

Based on these results and other routine sub-slab soil vapor monitoring data, system shutdowns, given sufficient time, will cause concentrations to rebound in a limited area to levels similar to baseline concentrations observed before SVE was implemented. The maximum rebound concentrations observed in sub-slab vapor samples (510,000 µg/m^3 at VP-2 and 260,000 µg/m^3 at VP-5) were an order of magnitude higher than the maximum rebound concentrations in SVE monitoring well samples (16,000 µg/m^3 at VOW-17 and 2,900 µg/m^3 at BOP-84[i]). SVE monitoring well samples are collected from screened intervals of approximately 5 ft to 45 ft bgs. The significantly higher rebound concentrations at some sub-slab vapor points compared to SVE monitoring well sampling locations may indicate that residual contaminant mass is located within the shallow subsurface. Given rebounding concentrations to levels observed before SVE treatment was implemented, it appears that the SVE system would benefit from additional optimization measures in some areas of the FVDSA.

It should be noted that soil samples were not collected/analyzed for VOCs during the previous investigations within the FVDSA as sampling criteria was not met (i.e., elevated field screening photoionization detector [PID] readings greater than 50 parts per million) for sample collection criteria per the ODEQ-approved work plan (LAI 2011b) and/or because of lack of accessibility due to the presence of facility equipment and operations. However, in 2018, Boeing reconfigured the equipment layout and operations on the FVDSA; thereby making previously inaccessible areas in the FVDSA accessible. The current configuration allows for samples to be collected closer to the former vapor degreaser footprint.

1.2 Investigation Objective

The objective of this investigation was to gather data needed to evaluate potential SVE treatment optimization by using: 1) rebound testing of shallow soil vapor to delineate where residual contamination likely remains in shallow soil; and 2) soil testing to assess the presence of magnitude of contaminant mass present in soil less than 5 ft bgs in areas previously inaccessible due to Boeing operations.

Proposed soil vapor rebound testing was conducted by measuring the increase in contaminant concentrations over time after the SVE system was shut down and until equilibrium was observed. The sequence and magnitude of rebounding soil vapor concentrations at each sampling point would theoretically be indicative of where remaining contaminant mass is located.

Soil testing was proposed in areas where sub-slab soil vapor data indicated rebound concentrations well above the TCE screening level (near VP-1, VP-2, and VP-5; Figure 2). Data was used to evaluate whether residual contaminant mass is bound to soil within 5 ft bgs or if permeable soils are transporting residual mass to sub-slab locations from deeper intervals. This information was used to assess shallow-subsurface treatment options.

2.0 INVESTIGATION ACTIVITIES

The following sections describe the details of implementing the activities proposed in the work plan (LAI 2020b) and any deviations from the work plan.

2.1 SVE System Shutdown

The SVE system was temporarily shut down on December 16, 2020 during soil sampling (Section 2.2) and vapor point installation (Section 2.3) to prevent potential SVE interference during vapor point leak testing and field screening of soil samples. After field work was completed on December 31, 2020, the system was restarted and remained operational through the first semiannual SVE system operations, maintenance, and management (OMM) sampling of 2021. The system must be operational to perform OMM inspection and sampling tasks.

The SVE system was shut down for rebound testing on February 17 through April 8, 2021. The system has been fully operational since rebound testing was concluded in April.

2.2 Shallow Soil Sampling

Five shallow soil borings (B-1 through B-5) advanced by hand to a maximum depth of 5 ft bgs were proposed in the work plan (Figure 2). Borings B-2 and B-3 were moved approximately 5 ft north of the locations proposed in the work plan because gravel indicative of a recent excavation backfill was encountered, which would not represent source area soil. An additional soil boring (B-6) was completed during the investigation to provide additional coverage on the south end of the FVDSA. All six soil borings were installed between December 28 and 31, 2021. A subcontractor performed the concrete coring through the building floor and assisted LAI with boring down to the maximum depth (approximately 5 ft bgs), as necessary. An environmental professional from LAI supervised concrete coring, conducted all sampling activities, prepared a descriptive log of each soil boring, and screened samples for indications of potential contamination. All samples collected were visually described in the field in general accordance with ASTM International D2488-17, *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure). Environmental field screening consisted of visual and olfactory observations (sheen, staining, and odor) as well as PID headspace analysis, and were recorded on exploration logs. Boring logs are provided in Appendix A.

At each boring, a maximum of three soil samples were collected. The general sampling procedure, provided in the work plan (LAI 2020b), involved field screening for VOCs using a PID to determine the area of highest apparent contamination within the 5-ft soil boring. If the PID and other field screening techniques did not indicate the presence of contamination, one sample was collected from within the top (0–1 ft bgs), middle (2–3 ft bgs), and bottom (4–5 ft bgs) intervals of the boring (and select soils with the highest silt content, if possible). Sample intervals were approximately 0.5–1 ft in length, or long enough to collect sufficient volume to fill the required sample containers.

A total of 15 soil samples were collected for laboratory analysis. One sample (B-3[2.5-3.0]123020) was held/archived for future analysis. Soil samples were collected in laboratory-supplied jars and submitted to Eurofins Lancaster Laboratories Environmental (ELLE) in Lancaster, Pennsylvania for analysis of VOCs by US Environmental Protection Agency (EPA) Method 8260D, in accordance with the site-specific sampling and analysis plan (SAP; LAI 2012b).

2.3 Sub-Slab Vapor Point Installation and Sampling

Ten sub-slab vapor points (VP-10 through VP-19) were installed on December 31, 2020. All vapor points are shown on Figure 2. Rebound sampling was conducted at the 10 new vapor points as well as at existing vapor points (VP-1 through VP-9) and three soil vapor observation wells (VOW-16 through VOW-18) in accordance with the SAP (LAI 2012b). The first rebound sampling event was performed in conjunction with the routine semiannual vapor monitoring on February 18, 2021 (24 hours post-SVE system shutdown) at all 19 vapor points, the three soil vapor observation wells, and seven SVE wells. Additional rebound sampling at the three soil vapor observation wells and the 19 vapor points was performed on February 24, March 18, and April 8, 2021 (approximately 1 week, 4 weeks, and 7 weeks after shutdown, respectively) to evaluate changes in VOC concentrations beneath the Building 85-001 slab as a result of the SVE system being shut down.

Sub-slab soil vapor samples and samples from soil vapor observation wells were collected in 1-liter Summa canisters and sent to Eurofins Air Toxics, LLC in Folsom, California for analysis of VOCs by EPA Method TO-15 (TGA remedy VOCs of interest only—TCE; cis-1,2-dichloroethene [cDCE]; vinyl chloride [VC]; 1,1,1-trichloroethane [TCA]; tetrachloroethene [PCE]; and 1,1-dichloroethene [1,1-DCE]). Soil vapor sampling procedures are described in the ODEQ-approved work plan for the previous investigations and the ODEQ *Guidance for Assessing and Remediating Vapor Intrusion in Buildings* (ODEQ 2010).

2.4 Deviations from the Work Plan

The investigation was implemented as planned, except for the following deviations:

- The original location for boring B-2 was attempted but ultimately abandoned, because a secondary slab of concrete was encountered at 2 ft bgs. A replacement boring, B-2R, was completed about 5 ft to the north of B-2. It is possible that the secondary slab was a remnant of the former shot peen machine that was present in the FVDSA. The shot peen machine required a "basement," which was backfilled with gravel when the machine was removed.
- After encountering the backfill and secondary slab at B-2, the boring location for B-3 was also moved about 5 ft north to avoid obstructions.
- An additional boring location, B-6, was completed to the south end of the (presumed) shot peen machine basement area to provide greater spatial coverage after B-2 and B-3 were moved north.

- Large cobbles were encountered at depths of 2–5 ft bgs; these cobbles caused refusal at borings B-1, B-2, and B-4. The boring could not be extended past 4.3 ft bgs at B-1 and 3.3 ft bgs at B-4.
- During vapor point sampling, an apparent blockage of the sampling port was discovered at VP-12 on February 24, 2021. Other than the initial sample collected on February 18, 2021, no other rebound samples were able to be collected at VP-12. The sampling port could not be cleaned or fixed without applying vacuum or re-installing the point, which would have caused too much disturbance during the rebound investigation.

3.0 INVESTIGATION RESULTS

A total of 15 soil samples were collected for laboratory analysis during the shallow subsurface investigation. Initial sub-slab soil vapor samples were collected at all 19 vapor points and three soil vapor observation wells. Three additional rounds of sampling were performed at 18 of the 19 vapor points and three soil vapor observation wells for evaluation of VOC rebound in Building 85-001 sub-slab soil vapor; a total of 85 soil vapor samples were collected for laboratory analysis for the SVE system rebound test. The subsections below present the observed shallow soil lithology and the results of the field investigation. Analytical results for soil and soil vapor samples are presented in Tables 1 and 2, respectively. Boring logs are provided in Appendix A. Analytical laboratory reports are provided in Appendix B.

Soil and soil vapor results were compared to ODEQ Risk-Based Concentrations (RBCs) for Individual Chemicals (ODEQ 2018) assuming an exposure pathway of vapor intrusion into buildings and an occupational receptor scenario. Applicable screening levels are provided in Tables 1 and 2.

3.1 Shallow Soil Lithology and Sampling Results

Boring logs for the shallow soil explorations are provided in Appendix A. Visual classification of soils identified primarily fill material directly beneath a concrete building slab that is approximately 6–9 inches thick. The course, sandy, angular gravel fill material extended to depths of up to 4.2 ft bgs (boring B-3) but was generally limited to depths of 2 ft bgs. Beneath the fill material was stiff, gravely silt. Consistent with logs from previous explorations, large cobbles were encountered at depths of 2–5 ft bgs; these cobbles caused refusal at borings B-1, B-2, and B-4.

The analytical results for VOCs of interest in soil samples are provided in Table 1 and are summarized below. PCE and TCE were the only constituents detected, but concentrations did not exceed their respective ODEQ RBCs protective of indoor air.

- cDCE and VC were not detected above the laboratory reporting limit in any of the 14 soil samples analyzed (one sample held for future analysis).
- PCE and TCE were detected in the 2–3 ft depth interval at boring B-6. PCE was detected at 46.9 micrograms per kilogram (µg/kg), nearly three orders of magnitude below the RBC of 36,000 µg/kg. TCE was detected at 64.5 µg/kg, nearly two orders of magnitude below the RBC of 2,300 µg/kg.

As indicated above, only PCE and TCE were detected in soil samples and concentrations did not exceed RBCs. The magnitude and infrequency of TCE detections in soil suggest the residual TCE source is not within 5 ft of the ground surface. In combination with the soil vapor data discussed below, remaining soil contamination appears to be localized to a small area near the southwest end of the former vapor degreaser.

3.2 SVE System Rebound Test Results

The soil vapor analytical results for the SVE system rebound test are provided in Table 2 and are summarized below. All five VOC analytes (PCE, TCE, TCA, cDCE, 1,1-DCE, and VC) were detected, but TCE was the only constituent to exceed the applicable ODEQ RBC protective of indoor air over the course of the rebound test. All results for TCE are presented on Figure 3, which shows that a total of four vapor points exhibited significant rebound relative to increases observed at all other locations. Results for these four select locations are also presented on Figure 4 to distinguish these results from all other locations where minimal rebound was observed. Further evaluation of these results is discussed in Section 4.2.

The TCE concentrations at vapor points VP-6 (530 µg/m^3) and VP-13 (360 µg/m^3) in the first sampling event (24 hours post-shutdown) were about an order of magnitude higher than any of the other vapor points. Additionally, the most rapid increase of TCE concentrations in soil vapor during rebound testing occurred at vapor points VP-6 and VP-13 (Figure 4). Concentrations at these two locations increased by two to five times, respectively, by the second sampling event (1 week post-shutdown). The TCE concentrations at VP-13 also reached the highest total concentration (7,900 µg/m^3) by the end of the rebound testing period (7 weeks post-shutdown).

TCE concentrations in soil vapor at vapor points VP-1 and VP-5 increased more slowly than VP-6 and VP-13 initially but exhibited accelerating increases by the third sampling event (4 weeks post-shutdown) and overall increases similar to VP-6 and VP-13 by the end of the rebound testing period (Figure 4).

TCE concentrations in soil vapor at 15 of the 19 vapor points (VP-2, VP-3, VP-4, VP-7 through VP-12, and VP-14 through VP-19) and all three soil vapor observation wells (VOW-16, VOW-17, and VOW-18) did not exhibit significant increases over the course of the rebound test. The average TCE concentrations detected at these 18 locations increased from approximately 40 to 153 µg/m^3 during the rebound test, which represents an increase of less than four times the starting concentration and a significantly lower maximum concentration than VP-1, VP-5, VP-6, and VP-13. These data do not indicate a localized subsurface source of VOCs near these vapor points.

4.0 DATA EVALUATION AND RECOMMENDATIONS

The shallow soil data collected during the subsurface investigation and the sub-slab soil vapor data collected during the SVE rebound test all provide valuable information about the current conditions that exist in the TGA beneath Building 85-001. This section evaluates the results presented in Section 3.0 and discusses options for optimization of the SVE system.

4.1 Shallow Soil Data

Only PCE and TCE were detected in soil samples at boring B-6, but concentrations did not exceed RBCs. The limited number and low levels of these soil detections do not suggest a particular location of VOC contamination within 5 ft bgs.

4.2 SVE Rebound Evaluation

The rapid/immediate and high level of increases in TCE concentrations at vapor points VP-6 and VP-13, followed by later rapid and high-level increases at vapor points VP-5 and then VP-1 (which are likely farther from the source), indicate a relatively localized area of VOC contamination that remains in the vadose zone proximate to the south and to the west of the former vapor degreasers. Vapor point samples were collected from directly beneath the building slab and there were no commensurate increases in soil vapor concentrations observed from a deeper screened interval within the TGA (e.g., 5- to 45-ft screens at VOW-17 or VOW-18). Shallow (less than 5 ft bgs) soil sample data from locations near vapor points with rapid rebound (i.e., B-1, B-2R, and B-6) did not yield significant concentrations of TCE. Therefore, the data from these four vapor points do not provide information of the specific depth of remaining TCE in soil vapor but suggest that it is likely located in the upper portion of the vadose zone. The vadose zone extends from below the building slab to an average depth of 50 ft bgs, depending on fluctuations in water table elevations.

The relatively rapid increases in TCE concentrations at vapor points VP-6 and VP-13 suggest that these vapor points are located relatively close to a residual source are of TCE in soil. The gradual increases in TCE at vapor points VP-1 and VP-5 suggest that these locations are also within the vicinity of residual source mass, but likely farther away than from VP-6 and VP-13.

The time frame and rate at which the observed VOC concentrations increased at these two groups of wells may also indicate areas of comparatively higher or lower permeability soils (Air Force Center for Environmental Excellence [AFCEE] 2001). Based on the age of the contamination and duration that the SVE system has been running, it is likely that all remaining mass transfer from soil to soil vapor is diffusion-limited. Therefore, it is possible that there may also be residual source material proximate to VP-1 and VP-5, but the mass transfer from lower permeability soils to these soil vapor monitoring points would consequently be slower.

Iso-concentration contours showing the TCE distribution in sub-slab soil vapor at 24 hours, 1 week, 4 weeks, and 7 weeks post-shutdown are presented on Figure 5. The development and apparent expansion of the rebound vapor plume (as indicated by the progression of the contours on these time sequence figures) suggests that localized VOC contamination remaining near VP-13 and the former vapor degreaser is likely the primary source of VOCs in the soil vapors observed. While this does not preclude the possibility that there are other sources of residual VOC contamination located within lower permeability soil nearer to VP-1 and VP-5, these contours support the conclusion that the behavior of the rebound data is primarily related to distance from the localized contamination near the former vapor degreaser.

4.3 SVE System Optimization

The TGA aquifer is a very dense formation consisting of unconsolidated silty gravel with boulders and cobbles. During installation of the original SVE system, a pilot test was conducted to evaluate air permeability. The results of the SVE pilot tests indicate that the TGA unit is "tight" and that induction of air flow through the formation is likely to be limited. However, the range of calculated soil vapor permeability values was not so low as to preclude the use of SVE as a potential remedial technology at the site. For sites with low soil permeability, higher flow rates or vacuums will generally not improve mass removal. In fact, sites with relatively thin layers of contamination in low-permeability soils can be more efficiently remediated by using smaller blowers and lowering the flow rates of soil vapor extraction (AFCEE 2001). The TGA's relatively low air permeability will require extended SVE remediation time frames and potentially a smaller and more targeted set of vapor extraction wells.

Rebound testing provided information useful for optimization of the SVE system at Boeing Portland. A phased approach for optimization is recommended that includes making stepwise modifications to the SVE system and monitoring for performance feedback after each modification is made. The initial recommended set involves reducing the number of active SVE wells to focus treatment in the area with the highest remaining vapor concentrations. Further optimization might include installation of new SVE wells, but those plans will depend on accessibility and Boeing's use of this area, which is unknown at this time. If intrusive work is viable and warranted, then Boeing will prepare and submit a work plan to ODEQ for approval.

The first recommended modification is to shut off existing extraction wells in areas where rebound was not observed (or at least reached a point of diminishing effectiveness). Once turned off, the extraction rates at the remaining wells will be adjusted to improve VOC removal based on the optimal mass removal rate. The AFCEE *Guidance on Soil Vapor Extraction Optimization* (AFCEE 2001) recommends:

- Reducing extraction rates at wells producing low levels of VOCs if rebound testing indicates the wells are treating a diffusion-limited area,
- Turning off wells that are producing low levels of VOCs and no longer produce a rebound during testing, and

- Increasing extraction rates at wells producing higher VOC levels indicative of impacted soils.

Currently the SVE blower is run with very little dilution air to provide maximum suction at each well point. SVE wellhead flow rates are limited by soil permeability, not blower suction. Current SVE wells have the following average flow rates measured between February 2020 and February 2021:

Well Name	Average Flow Rate (scfm) February 2020–February 2021
BOP-78(i)	41
BOP-79(i)	39
BOP-84(i)	49
BOP-85(i)	41
BOP-86(i)	42
BOP-87(i)	178
BOP-88(i)	107

scfm = standard cubic feet per minute

Of the vapor points where rebound occurred, relatively low mass transfer rates are indicated by rebound results at VP-1 and VP-5. Treatment in these areas would be best conducted with lower SVE extraction rates to match diffusion-limited mass transfer rates. VP-1 and VP-5 are closest to SVE well BOP-84(i), which is a potential location where a lower flow rate may increase mass removal efficiency.

The relatively minor increases in TCE concentrations at vapor points VP-2, VP-3, VP-4, VP-7 through VP-12, and VP-14 through VP-19 indicate that the soil in the vicinity of four existing SVE wells (BOP-78[i], BOP-79[i], BOP-87[i], and BOP-88[i]) are no longer influenced by residual VOC contamination. It is recommended that these four wells be turned off on a temporary basis. If TCE concentrations at sub-slab monitoring points near these SVE wells increase to levels above the 2,900 $\mu g/m^3$ screening level, then the wells will be turned back on to mitigate potential vapor intrusion effects.

Relatively high mass transfer is indicated by rebound results at VP-6 and VP-13, which are in the vicinity of two SVE wells (BOP-85[i] and BOP-86[i]). These wells are already operated at their maximum flow rate; therefore, flow rate through the current screens is not inhibiting treatment. Rather, it is likely that current SVE screens are too long and are not effectively targeting the depth interval where remaining shallow VOC mass is located. These extraction rates should also be decreased, which may allow for a more even flow of vapor across the screen even in areas with low permeability.

5.0 USE OF THIS DOCUMENT

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

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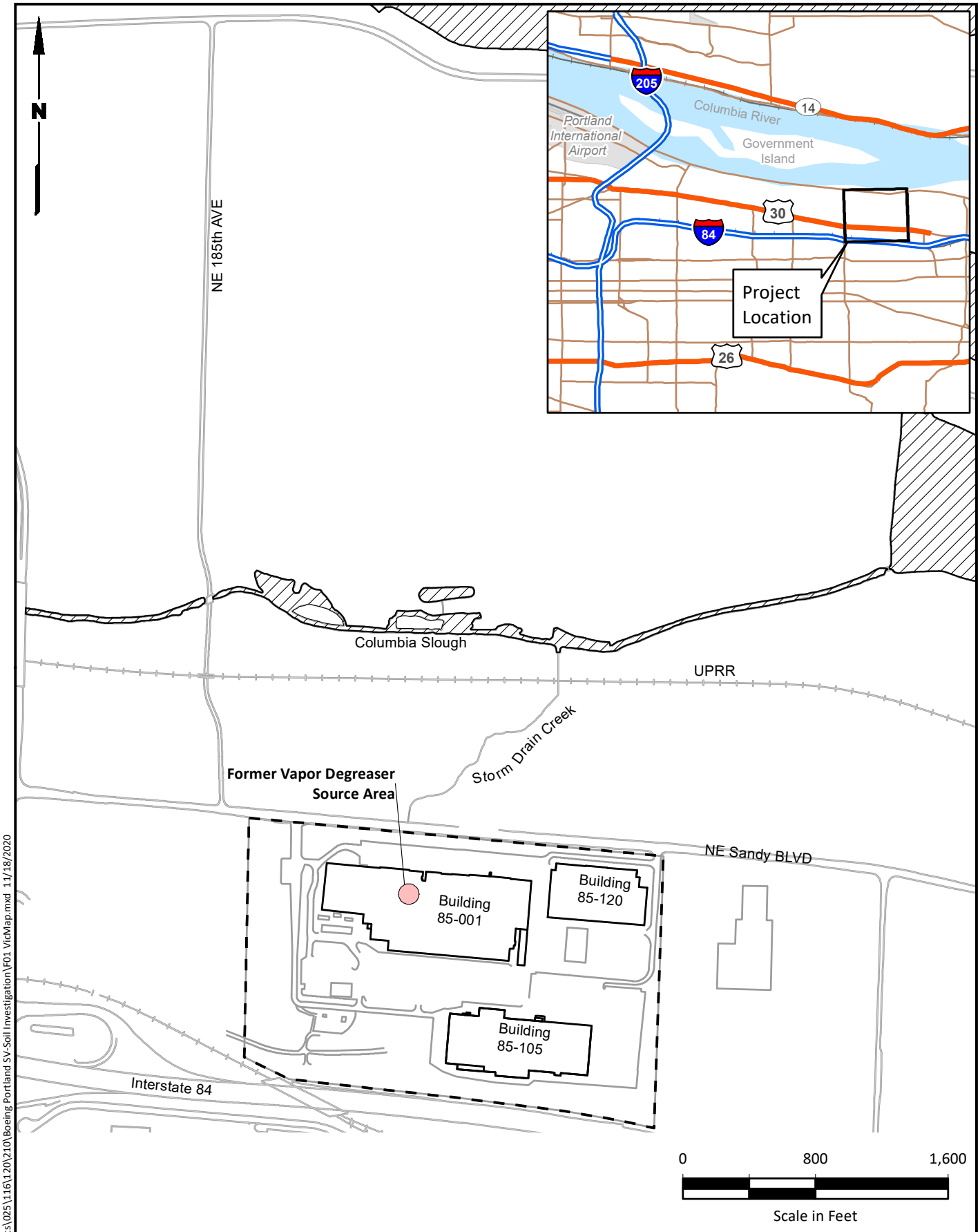

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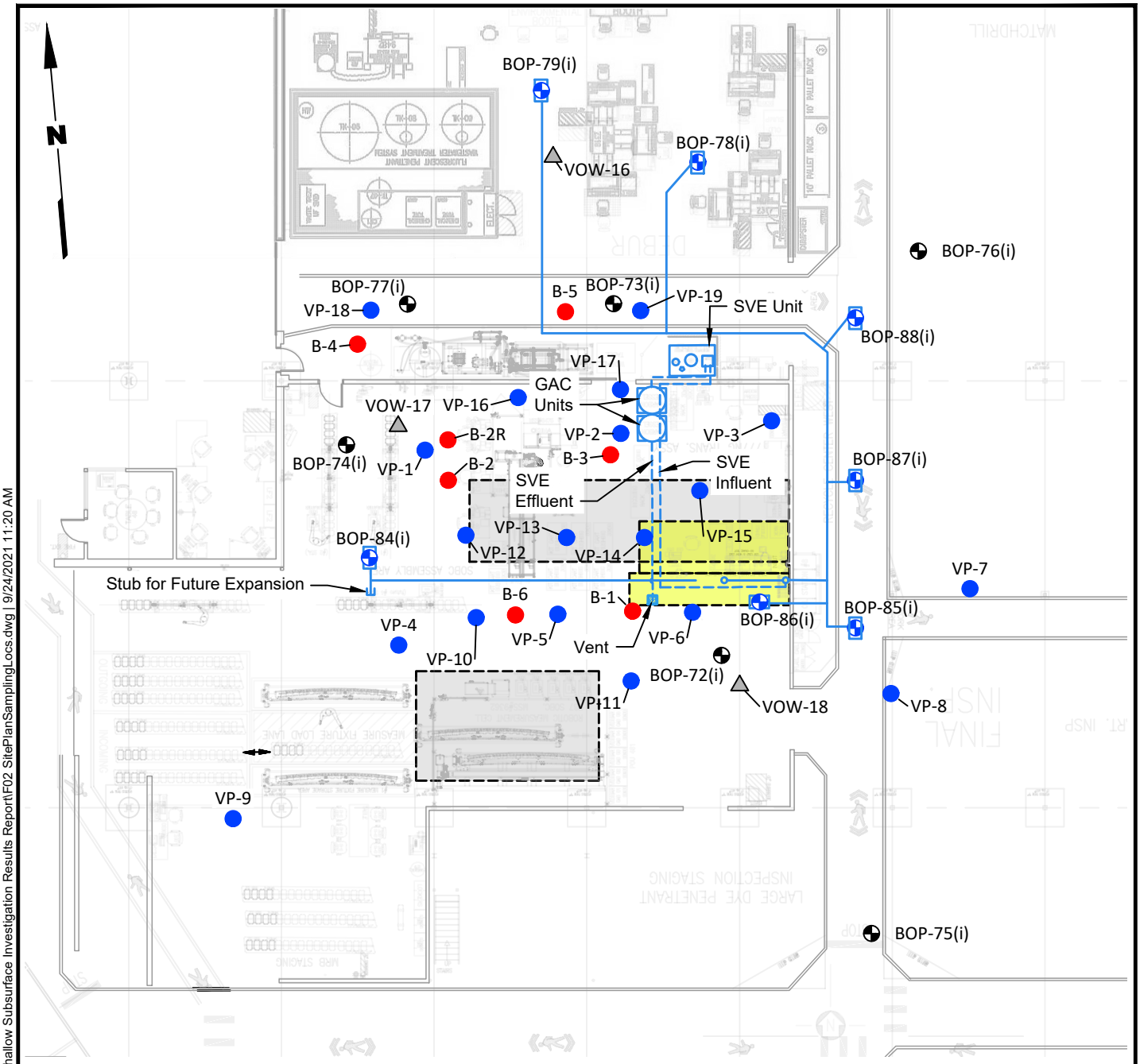
Boeing Portland Gresham, Oregon	**Boeing Portland Site Map**	Figure 1



Legend

- Soil Boring (5 ft below ground surface) Location
- Sub-Slab Vapor Pin Location
- Multiple-Purpose SVE and Monitoring Well Location
- Monitoring Well Location
- Vapor Observation Well Location
- Approximate Location of Basements
- Approximate Location of Former Degreasers
- Below-ground SVE Piping
- Above-ground SVE Piping

Note

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

0 20 40

Scale in Feet

Source: The Boeing Company

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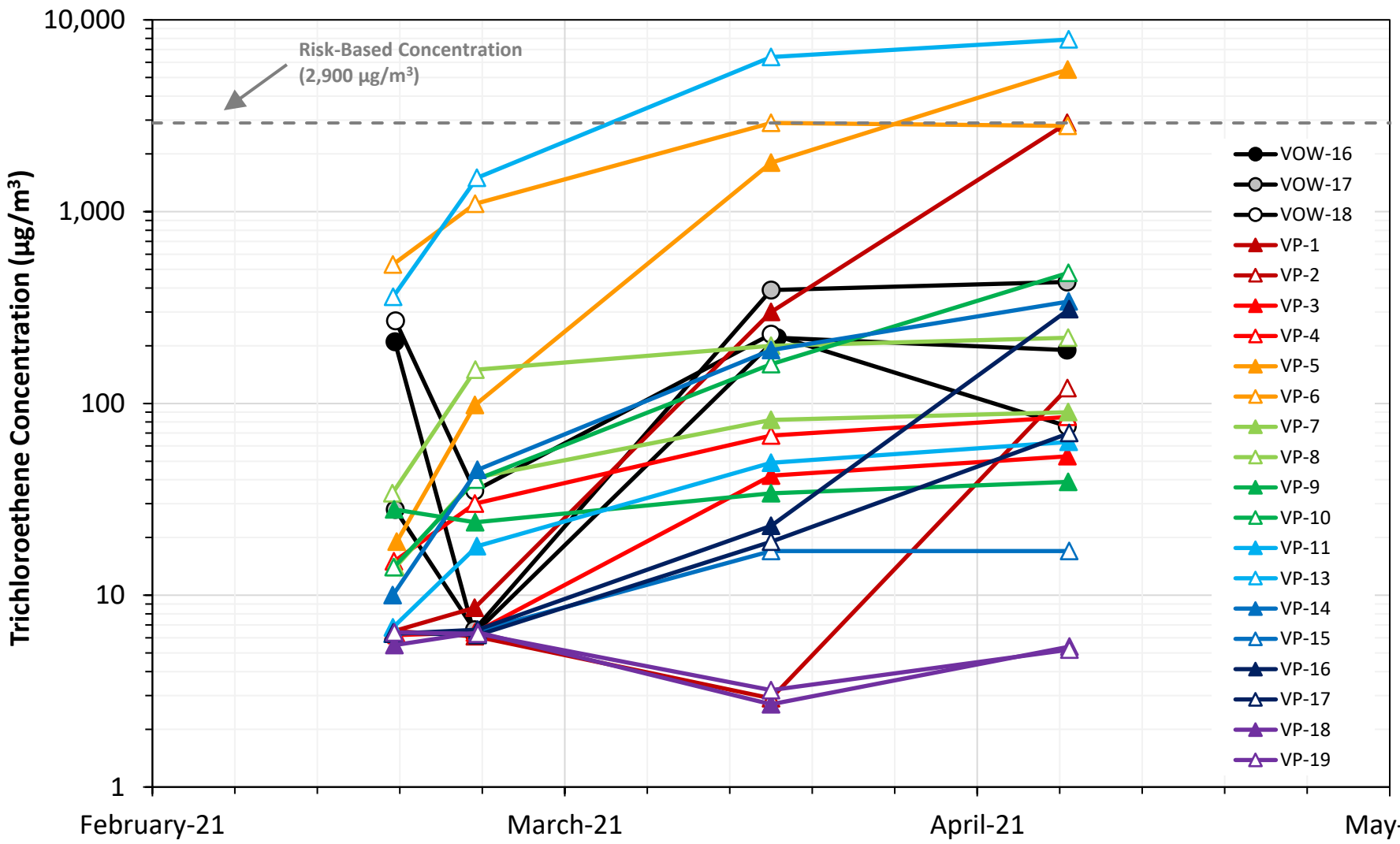
Boeing Portland Gresham, Oregon	**Site Plan and Sampling Locations**	Figure 2



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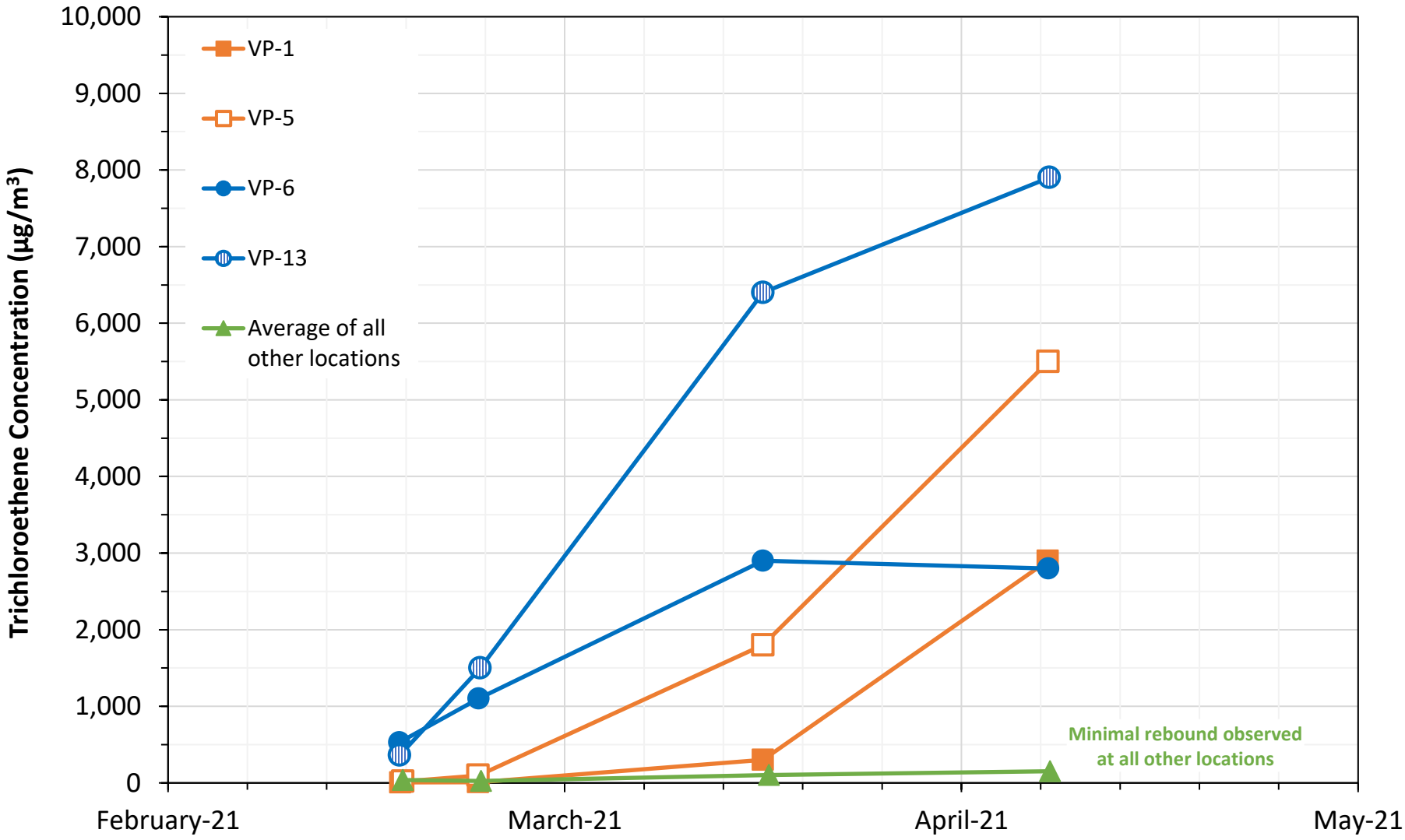
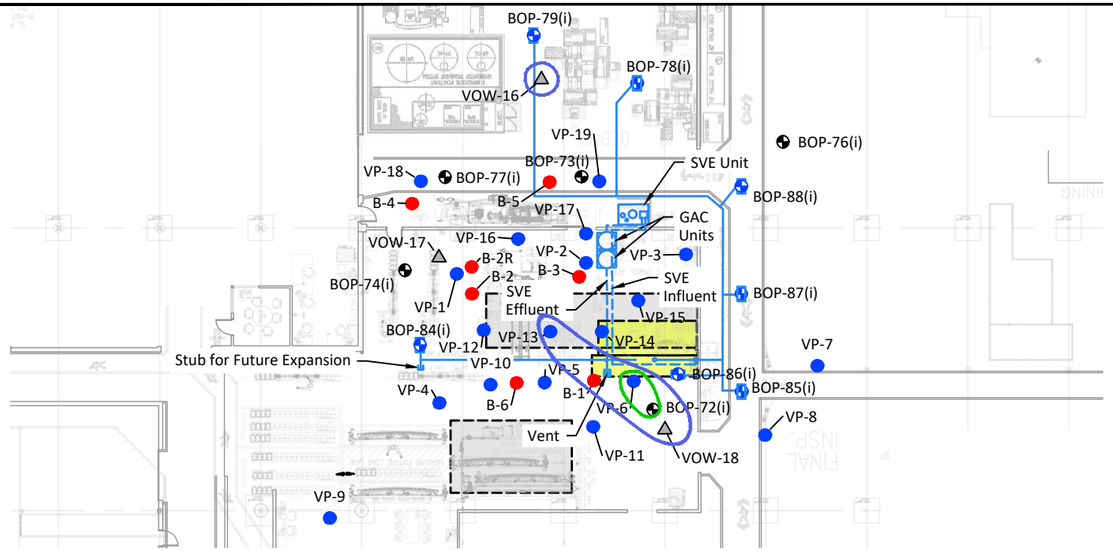
Boeing Portland Gresham, Oregon	**SVE Rebound Results – Trichloroethene at All Locations**	Figure 3



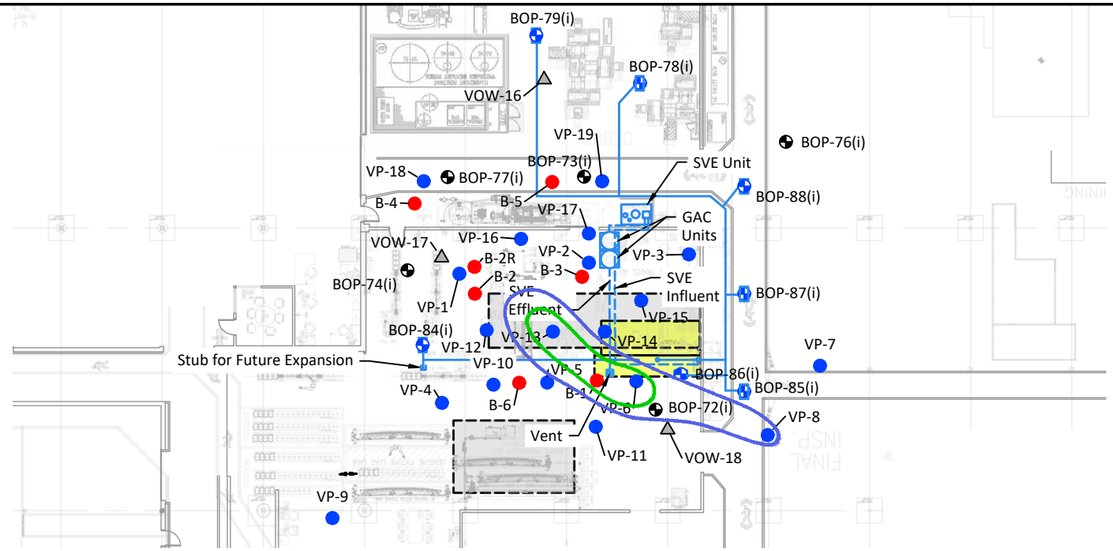
Note: Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

LANDAU ASSOCIATES

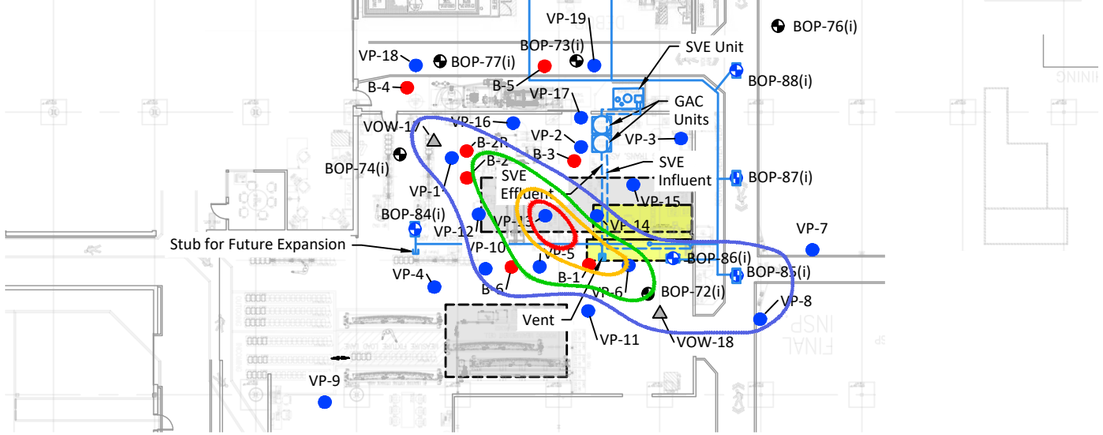
Boeing Portland Gresham, Oregon	**SVE Rebound Results – Trichloroethene at Select Locations**	Figure 4



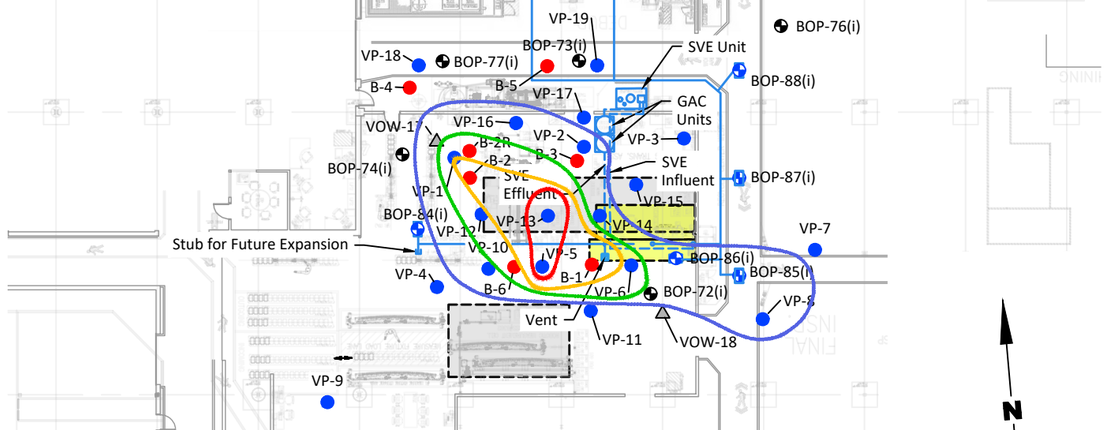
February 18, 2021 (24 hours post-shutdown)



February 24, 2021 (1 week post-shutdown)



March 18, 2021 (4 weeks post-shutdown)



April 8, 2021 (7 weeks post-shutdown)

Legend

- 5000 µg/m³
- 2900 µg/m³
- 500 µg/m³
- 100 µg/m³
- Soil Boring (5 ft below ground surface) Location
- Sub-Slab Vapor Pin Location
- Multiple-Purpose SVE and Monitoring Well Location
- Monitoring Well Location
- Vapor Observation Well Location
- Approximate Location of Basements
- Approximate Location of Former Degreasers
- Below-ground SVE Piping
- Above-ground SVE Piping

Note

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

N

0 30 60

Scale in Feet

Source: The Boeing Company

Boeing Portland Gresham, Oregon	**SVE Rebound Results - Isoconcentration Contours**	Figure 5

Landau Associates

Table 1
Soil Analytical Results
Boeing Portland
Gresham, Oregon

Location	Interval (ft bgs)	Field Sample ID	Sample Date	Volatile Organic Compounds (EPA Method 8260D; µg/kg)			
				cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
ODEQ Risk-Based Concentration (a)				**(b)**	**36,000**	**2,300**	**2,200**
B-1	0.5-1.0	B-1(0.5-1.0)122920	12/29/2020	22.8 U	22.8 U	22.8 U	22.8 U
B-1	2.0-3.0	B-1(2.0-3.0)122920	12/29/2020	29.6 U	29.6 U	29.6 U	29.6 U
B-1	4.0-4.3	B-1(4.0-4.3)122920	12/30/2020	21.7 U	21.7 U	21.7 U	21.7 U
B-2	2.0-3.0	B-2(2.0-3.0)123020	12/30/2020	23.5 U	23.5 U	23.5 U	23.5 U
B-2	4.0-4.6	B-2(4.0-4.6)123020	12/30/2020	24.4 U	24.4 U	24.4 U	24.4 U
B-3	4.0-4.2	B-3(4.0-4.2)123020	12/30/2020	24.4 U	24.4 U	24.4 U	24.4 U
B-4	0.5-1.0	B-4(0.5-1.0)122820	12/28/2020	36.3 U	36.3 U	36.3 U	36.3 U
B-4	2.0-3.0	B-4(2.0-3.0)122820	12/28/2020	25.1 U	25.1 U	25.1 U	25.1 U
B-5	0.5-1.0	B-5(0.5-1.0)122920	12/29/2020	24.1 U	24.1 U	24.1 U	24.1 U
B-5	2.0-3.0	B-5(2.0-3.0)122920	12/29/2020	31.9 U	31.9 U	31.9 U	31.9 U
B-5	4.0-5.0	B-5(4.0-5.0)122920	12/29/2020	29.7 U	29.7 U	29.7 U	29.7 U
B-6	0.5-1.0	B-6(0.5-1.0)123120	12/31/2020	25.2 U	25.2 U	25.2 U	25.2 U
B-6	2.0-3.0	B-6(2.0-3.0)123120	12/31/2020	29.3 U	**46.9**	**64.5**	29.3 U
B-6	4.0-5.0	B-6(4.0-5.0)123120	12/31/2020	27.9 U	27.9 U	27.9 U	27.9 U

Notes:

(a) Risk-based concentration in soil protective of vapor intrusion into buildings for an occupational receptor scenario. From Oregon Department of Environmental Quality, "Risk-Based Concentrations for Individual Chemicals," updated May 2018.

(b) The constituent risk-based concentration for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario. No risk-based concentration is assigned.

U = Analyte not detected at or above the reporting limit.
Bold text indicates detected analyte**.**

Abbreviations and Acronyms:

µg/kg = micrograms per kilogram
bgs = below ground surface
EPA = US Environmental Protection Agency
ft = feet
ID = identification
mg/kg = milligrams per kilogram
mg/L = milligrams per liter
ODEQ = Oregon Department of Environmental Quality

Table 2
Vapor Rebound Analytical Data
Boeing Portland
Gresham, Oregon

Location	Field Sample ID	Sample Date	Volatile Organic Compounds (EPA Method TO-15; µg/m^3)					
			1,1,1-Trichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
ODEQ Risk-Based Concentration (a)			21,900,000	880,000	(b)	47,000	2,900	2,800
VOW-16	VOW-16-0820	8/21/2020	**7.2**	4.8 U	4.8 U	**43**	6.5 U	3.1 U
VOW-16	VOW-16-0221	2/18/2021	**27**	**6.2**	**20**	**44**	**210**	**24**
VOW-16	VOW-16-022421	2/24/2021	**9.3**	4.5 U	4.5 U	**25**	**6.3**	2.9 U
VOW-16	VOW-16-031821	3/18/2021	11 U	8.2 U	**55**	**48**	**220**	**70**
VOW-16	VOW-16-040821	4/8/2021	53 U	38 U	38 U	66 U	**190**	**40**
VOW-17	VOW-17-0820	8/21/2020	6.6 U	4.8 U	4.8 U	**23**	6.5 U	3.1 U
VOW-17	VOW-17-0221	2/18/2021	5.8 U	4.2 U	4.2 U	**39**	**28**	**22**
VOW-17	VOW-17-022421	2/24/2021	6.6 U	4.8 U	4.8 U	**33**	6.6 U	3.1 U
VOW-17	VOW-17-031821	3/18/2021	**8.8**	**6.2**	**21**	**60**	**390**	**140**
VOW-17	VOW-17-040821	4/8/2021	**6.2**	4.1 U	**21**	**47**	**430**	**33**
VOW-18	VOW-18-0820	8/21/2020	6.6 U	4.8 U	4.8 U	**61**	6.5 U	3.1 U
VOW-18	VOW-18-0221	2/18/2021	**6.4**	4.6 U	4.6 U	**110**	**270**	3 U
VOW-18	VOW-18-022421	2/24/2021	6.6 U	4.8 U	4.8 U	**65**	**35**	3.1 U
VOW-18	VOW-18-031821	3/18/2021	**17**	2 U	2 U	**96**	**230**	1.3 U
VOW-18	VOW-18-040821	4/8/2021	**38**	3.9 U	**4**	**78**	**76**	2.5 U
VP-1	VP-1-0820	8/21/2020	6.5 U	4.7 U	4.7 U	**29**	**6.9**	3 U
VP-1	VP-1-0221	2/18/2021	6.6 U	4.8 U	4.8 U	**62**	6.5 U	3.1 U
VP-1	VP-1-022421	2/24/2021	6.9 U	5 U	5 U	**63**	**8.6**	3.2 U
VP-1	VP-1-031821	3/18/2021	**5.9**	2 U	2 U	**85**	**300**	**5.9**
VP-1	VP-1-040821	4/8/2021	18 U	13 U	13 U	**84**	**2,900**	8.2 U
VP-2	VP-2-0820	8/21/2020	6.4 U	4.6 U	4.6 U	**36**	6.3 U	3 U
VP-2	VP-2-0221	2/18/2021	6.6 U	4.8 U	4.8 U	**70**	6.5 U	3.1 U
VP-2	VP-2-022421	2/24/2021	6.2 U	4.5 U	4.5 U	**74**	6.1 U	2.9 U
VP-2	VP-2-031821	3/18/2021	2.9 U	2.1 U	2.1 U	**140**	2.9 U	1.4 U
VP-2	VP-2-040821	4/8/2021	**15**	4 U	4 U	**150**	**120**	2.6 U

Table 2
Vapor Rebound Analytical Data
Boeing Portland
Gresham, Oregon

Location	Field Sample ID	Sample Date	Volatile Organic Compounds (EPA Method TO-15; µg/m^3)					
			1,1,1-Trichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
ODEQ Risk-Based Concentration (a)			21,900,000	880,000	(b)	47,000	2,900	2,800
VP-3	VP-3-0820	8/21/2020	9.5	4.2 U	4.2 U	**24**	5.7 U	2.7 U
VP-3	VP-3-0221	2/18/2021	6.2 U	4.5 U	4.5 U	**67**	6.2 U	2.9 U
VP-3	VP-3-022421	2/24/2021	**30**	4.6 U	4.6 U	**33**	**6.4**	2.9 U
VP-3	VP-3-031821	3/18/2021	**210**	2 U	2 U	**70**	**42**	1.3 U
VP-3	VP-3-040821	4/8/2021	**350**	3.8 U	3.8 U	**62**	**53**	2.5 U
VP-4	VP-4-0820	8/21/2020	6.2 U	4.5 U	4.5 U	**60**	**33**	2.9 U
VP-4	VP-4-0221	2/18/2021	6.5 U	4.7 U	4.7 U	**92**	**15**	3 U
VP-4	VP-4-022421	2/24/2021	6.3 U	4.6 U	4.6 U	**65**	**30**	3 U
VP-4	VP-4-031821	3/18/2021	**8.6**	1.9 U	1.9 U	**81**	**68**	1.2 U
VP-4	VP-4-040821	4/8/2021	**8.6**	3.8 U	3.8 U	**62**	**85**	2.4 U
VP-5	VP-5-0820	8/21/2020	6.6 U	4.8 U	4.8 U	**59**	**52**	3.1 U
VP-5	VP-5-0221	2/18/2021	6.2 U	4.5 U	4.5 U	**87**	**19**	2.9 U
VP-5	VP-5-022421	2/24/2021	**14**	4.9 U	4.9 U	**58**	**98**	3.2 U
VP-5	VP-5-031821	3/18/2021	**66**	2 U	2 U	**140**	**1,800**	1.3 U
VP-5	VP-5-040821	4/8/2021	**110**	26 U	26 U	**240**	**5,500**	16 U
VP-6	VP-6-0820	8/21/2020	**4,000**	**54**	45 U	**87**	**690**	29 U
VP-6	VP-6-0221	2/18/2021	**4,000**	**38**	12 U	**110**	**530**	7.6 U
VP-6	VP-6-022421	2/24/2021	**5,600**	**68**	15 U	**96**	**1,100**	9.9 U
VP-6	VP-6-031821	3/18/2021	**13,000**	**140**	16 U	**200**	**2,900**	10 U
VP-6	VP-6-040821	4/8/2021	**10,000**	**120**	52 U	**180**	**2,800**	34 U
VP-7	VP-7-0820	8/21/2020	**240**	**6.9**	**6.6**	**34**	**26**	3.2 U
VP-7	VP-7-0221	2/18/2021	**160**	4.7 U	**4.8**	**58**	**14**	3 U
VP-7	VP-7-022421	2/24/2021	**470**	**6.4**	**8.1**	**38**	**41**	2.9 U
VP-7	VP-7-031821	3/18/2021	**1,200**	**9.1**	**14**	**72**	**82**	1.2 U
VP-7	VP-7-040821	4/8/2021	**1,200**	**12**	**15**	**60**	**90**	2.9 U

Table 2
Vapor Rebound Analytical Data
Boeing Portland
Gresham, Oregon

Location	Field Sample ID	Sample Date	Volatile Organic Compounds (EPA Method TO-15; µg/m^3)					
			1,1,1-Trichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
ODEQ Risk-Based Concentration (a)			21,900,000	880,000	(b)	47,000	2,900	2,800
VP-8	VP-8-0820	8/21/2020	**1,900**	**33**	**61**	**80**	**130**	15 U
VP-8	VP-8-0221	2/18/2021	**680**	**13**	**16**	**140**	**34**	3 U
VP-8	VP-8-022421	2/24/2021	**3,000**	**28**	**58**	**140**	**150**	6.8 U
VP-8	VP-8-031821	3/18/2021	**5,000**	**16**	**38**	**140**	**200**	3.8 U
VP-8	VP-8-040821	4/8/2021	**4,700**	**28**	**47**	**130**	**220**	17 U
VP-9	VP-9-0820	8/21/2020	5.9 U	4.3 U	4.3 U	**47**	**74**	2.8 U
VP-9	VP-9-0221	2/18/2021	5.9 U	4.3 U	4.3 U	**53**	**28**	2.7 U
VP-9	VP-9-022421	2/24/2021	6.7 U	4.8 U	4.8 U	**74**	**24**	3.1 U
VP-9	VP-9-031821	3/18/2021	**12**	2 U	2 U	**74**	**34**	1.3 U
VP-9	VP-9-040821	4/8/2021	**14**	3.9 U	3.9 U	**68**	**39**	2.5 U
VP-10	VP-10-0221	2/18/2021	6.2 U	4.5 U	4.5 U	**110**	**14**	2.9 U
VP-10	VP-10-022421	2/24/2021	6.5 U	4.8 U	4.8 U	**74**	**40**	3.1 U
VP-10	VP-10-031821	3/18/2021	**19**	2 U	2 U	**100**	**160**	1.3 U
VP-10	VP-10-040821	4/8/2021	**28**	4 U	4 U	**120**	**480**	2.6 U
VP-11	VP-11-0221	2/18/2021	6.4 U	4.7 U	4.7 U	**110**	**6.8**	3 U
VP-11	VP-11-022421	2/24/2021	**17**	4.6 U	4.6 U	**96**	**18**	3 U
VP-11	VP-11-031821	3/18/2021	**78**	2 U	2 U	**98**	**49**	1.3 U
VP-11	VP-11-040821	4/8/2021	**120**	4 U	4 U	**120**	**63**	2.6 U
VP-12	VP-12-0221	2/18/2021	6.3 U	4.6 U	4.6 U	**300**	6.2 U	3 U

Table 2
Vapor Rebound Analytical Data
Boeing Portland
Gresham, Oregon

Location	Field Sample ID	Sample Date	Volatile Organic Compounds (EPA Method TO-15; µg/m^3)					
			1,1,1-Trichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
ODEQ Risk-Based Concentration (a)			21,900,000	880,000	(b)	47,000	2,900	2,800
VP-13	VP-13-0221	2/18/2021	6.5 U	4.7 U	4.7 U	**120**	**360**	3 U
VP-13	VP-13-022421	2/24/2021	**25**	4.6 U	4.6 U	**130**	**1,500**	3 U
VP-13	VP-13-031821	3/18/2021	**90**	8.3 U	8.3 U	**230**	**6,400**	5.4 U
VP-13	VP-13-040821	4/8/2021	**120**	38 U	38 U	**300**	**7,900**	25 U
VP-14	VP-14-0221	2/18/2021	**29**	4.8 U	4.8 U	**110**	**10**	3.1 U
VP-14	VP-14-022421	2/24/2021	**92**	4.8 U	4.8 U	**91**	**45**	3.1 U
VP-14	VP-14-031821	3/18/2021	**360**	2 U	2 U	**140**	**190**	1.3 U
VP-14	VP-14-040821	4/8/2021	**390**	3.8 U	3.8 U	**170**	**340**	2.4 U
VP-15	VP-15-0221	2/18/2021	6.4 U	4.7 U	4.7 U	**62**	6.3 U	3 U
VP-15	VP-15-022421	2/24/2021	**11**	4.8 U	4.8 U	**70**	6.5 U	3.1 U
VP-15	VP-15-031821	3/18/2021	**140**	2 U	2 U	**94**	**17**	1.3 U
VP-15	VP-15-040821	4/8/2021	**220**	3.8 U	3.8 U	**74**	**17**	2.5 U
VP-16	VP-16-0221	2/18/2021	6.4 U	4.6 U	4.6 U	**72**	6.3 U	3 U
VP-16	VP-16-022421	2/24/2021	6.7 U	4.8 U	4.8 U	**97**	6.6 U	3.1 U
VP-16	VP-16-031821	3/18/2021	2.8 U	2 U	2 U	**110**	**23**	**3.2**
VP-16	VP-16-040821	4/8/2021	5.6 U	4.1 U	4.1 U	**76**	**310**	**5.5**
VP-17	VP-17-0221	2/18/2021	6.5 U	4.7 U	4.7 U	**95**	6.4 U	3 U
VP-17	VP-17-022421	2/24/2021	6.3 U	4.6 U	4.6 U	**100**	6.2 U	3 U
VP-17	VP-17-031821	3/18/2021	**5.9**	2 U	2 U	**130**	**19**	**3.9**
VP-17	VP-17-040821	4/8/2021	**14**	3.9 U	3.9 U	**100**	**70**	**4.9**

Table 2
Vapor Rebound Analytical Data
Boeing Portland
Gresham, Oregon

Location	Field Sample ID	Sample Date	Volatile Organic Compounds (EPA Method TO-15; µg/m^3)					
			1,1,1-Trichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	Tetrachloroethene	Trichloroethene	Vinyl Chloride
ODEQ Risk-Based Concentration (a)			21,900,000	880,000	(b)	47,000	2,900	2,800
VP-18	VP-18-0221	2/18/2021	5.6 U	4.1 U	4.1 U	**110**	5.5 U	2.6 U
VP-18	VP-18-022421	2/24/2021	6.5 U	4.7 U	4.7 U	**54**	6.4 U	3 U
VP-18	VP-18-031821	3/18/2021	2.8 U	2 U	2 U	**49**	2.7 U	1.3 U
VP-18	VP-18-040821	4/8/2021	5.5 U	4 U	4 U	**60**	5.4 U	2.6 U
VP-19	VP-19-0221	2/18/2021	6.5 U	4.8 U	4.8 U	**120**	6.4 U	3.1 U
VP-19	VP-19-022421	2/24/2021	6.4 U	4.6 U	4.6 U	**30**	6.3 U	3 U
VP-19	VP-19-031821	3/18/2021	3.3 U	2.4 U	2.4 U	**28**	3.2 U	1.5 U
VP-19	VP-19-040821	4/8/2021	**11**	3.8 U	3.8 U	**95**	5.2 U	2.5 U

Notes:

(a) Risk-based concentration in soil gas protective of vapor intrusion into buildings for an occupational receptor scenario. From Oregon Department of Environmental Quality, "Risk-Based Concentrations for Individual Chemicals," updated May 2018.

(b) The air concentration reported for the risk-based concentration exceeds the vapor pressure of the pure chemical. It can be assumed that this constituent cannot create an unacceptable risk by this pathway. No risk-based concentration is assigned.

U = Analyte not detected at or above the reporting limit

Bold text indicates detected analyte

= Detected concentration exceeds applicable risk-based concentration.

Abbreviations and Acronyms:

µg/m^3 = micrograms per cubic meter

EPA = US Environmental Protection Agency

ft = feet

ID = identification

ODEQ = Oregon Department of Environmental Quality

APPENDIX A

Boring Logs

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		GW	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		GM	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		SW	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		SM	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			ML	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			MH	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			PT	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		AC or PC	Asphalt concrete pavement or Portland cement pavement
ROCK		RK	Rock (See Rock Classification)
WOOD		WD	Wood, lumber, wood chips
DEBRIS		DB	Construction debris, garbage

Notes:
1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

Primary Constituent:	> 50% - "GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50% - "very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30% - "gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15% - "with gravel," "with sand," "with silt," etc.
	≤ 5% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted.

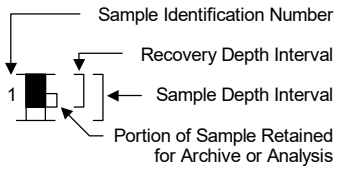
4. Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	2.50-inch O.D., 2.00-inch I.D. WSDOT
h	3.00-inch O.D., 2.375-inch I.D. Mod. California
i	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Vibrocore (Rotosonic/Geoprobe)
5	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
GT	Other Geotechnical Testing
CA	Chemical Analysis

Groundwater

▽	Approximate water level at time of drilling (ATD)
▼	Approximate water level at time after drilling/excavation/well

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Soil Classification System and Key

Figure
A-1

B-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Auger Ground Elevation (ft): NM Drilled By: JHA Environmental	
0						PC	Concrete slab	Groundwater not encountered.
	B-1 (0.5-1.0) 122920			0.0		GM ML	Dark gray, coarse sandy, fine angular GRAVEL (loose, damp) (FILL) Light tan/brown, medium gravely SILT (stiff, dry)	
							- Color grades from light tan to brown	
2							- Reddish brown	
	B-1 (2.0-3.0) 122920			0.0			- Color grades to lighter brown - Fine to medium gravely SILT	
						GM	Grayish brown, silty coarse GRAVEL with cobbles (dense, dry)	
4	B-1 (4.0-4.3) 122920			0.0			- Largest cobbles first observed	

Boring Completed 12/30/20
Total Depth of Boring = 4.3 ft.

6

8

10

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25116.12 8/30/21 N:\PROJECTS\25116.190 DEGREASER INVEST.GPJ SOIL BORING LOG

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Log of Boring B-1

Figure
A-2

B-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Auger Ground Elevation (ft): NM Drilled By: JHA Environmental	
0						PC	Concrete slab	Groundwater not encountered.
						GP/ SM	Light gray, sandy, angular GRAVEL with silt (dense, dry) (FILL)	
						ML	Light brown, gravely SILT (stiff, dry)	
2							- Gravel changes from angular to rounded	
	B-2 (2.0-3.0) 123020			0.0		GM		
						ML	Light brown, very silty angular GRAVEL (dense, dry)	
							Light brown, fine to coarse gravely SILT (stiff, dry)	
4	B-2 (4.0-4.6) 123020			0.0				

Boring Completed 12/30/20
Total Depth of Boring = 4.6 ft.

6

8

10

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25116.12 8/30/21 N:\PROJECTS\25116.190 DEGREASER INVEST.GPJ SOIL BORING LOG

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Log of Boring B-2

Figure
A-3

B-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Auger Ground Elevation (ft): NM Drilled By: JHA Environmental	
0						PC	Concrete slab	Groundwater not encountered.
						GM	Light gray, silty, angular GRAVEL with trace sand (medium dense, dry) (FILL)	
2	B-3 (2.5-3.0) 123020			0.0			- Color grades darker - Dark brown to gray, very silty (dense)	
4	B-3 (4.0-4.2) 123020			0.0				
6								
8								
10								

Boring Completed 12/30/20
Total Depth of Boring = 4.2 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25116.12 8/30/21 N:\PROJECTS\25116.190 DEGREASER INVEST.GPJ SOIL BORING LOG

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Log of Boring B-3

Figure
A-4

B-4

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Auger Ground Elevation (ft): NM Drilled By: JHA Environmental	
0						PC	Concrete slab	Groundwater not encountered.
	B-4 (0.5-1.0) 122820			0.0		GM GM	Dark gray, silty, angular GRAVEL with coarse sand (medium dense, damp) (FILL) Brown to gray, silty, coarse GRAVEL (medium stiff, dry)	
						ML	Tan/light brown SILT with minor fine gravel (medium stiff, dry)	
2	B-4 (2.0-3.0) 122820			0.0			- Reddish brown	
							- Color grades lighter, increasing gravel content	
	Boring Completed 12/28/20 Total Depth of Boring = 3.3 ft.							
4								
6								
8								
10								

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25116.12 8/30/21 N:\PROJECTS\25116.190 DEGREASER INVEST.GPJ SOIL BORING LOG

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Log of Boring B-4

Figure
A-5

B-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Auger Ground Elevation (ft): NM Drilled By: JHA Environmental	
0						PC	Concrete slab	Groundwater not encountered.
	B-5 (0.5-1.0) 122920			0.0		SP ML	Dark gray, gravely, coarse SAND (loose, damp) (FILL) Brown SILT with trace sand and gravel (very stiff, damp to dry) - Light brown with tan/gray hue	
2	B-5 (2.0-3.0) 122920			0.0			- Brown with red hue	
4	B-5 (4.0-5.0) 122920			0.0			- Brown with yellow/orange hue	
6								
8								
10								

Boring Completed 12/29/20
Total Depth of Boring = 5.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25116.12 8/30/21 N:\PROJECTS\25116.190 DEGREASER INVEST.GPJ SOIL BORING LOG

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Log of Boring B-5

Figure
A-6

B-6

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Hand Auger Ground Elevation (ft): NM Drilled By: JHA Environmental	
0						PC	Concrete slab	
	B-6 (0.5-1.0) 123120			0.0		SM GM ML	Dark gray, silty, coarse SAND with fine, subangular gravel (loose, damp) (FILL) - Layer of cobbles	Groundwater not encountered.
							Brown silty COBBLES with coarse sand and gravel (medium dense, damp)	
							Brown SILT with trace fine gravel (very stiff, dry)	
2							- Light brown/tan	
	B-6 (2.0-3.0) 123120			0.0			- Brown - Large boulder (2 ft x 2 ft)	
							- Brown with reddish hue	
4								
	B-6 (4.0-5.0) 123120			0.0			- Color grades from red to brown	
6								
8								
10								

Boring Completed 12/31/20
Total Depth of Boring = 5.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

25116.12 8/30/21 N:\PROJECTS\25116.190 DEGREASER INVEST.GPJ SOIL BORING LOG

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Log of Boring B-6

Figure
A-7

APPENDIX B

Analytical Laboratory Reports

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9/3/2020
Ms. Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 025116.120.412
Workorder #: 2008736

Dear Ms. Chris Kimmel

The following report includes the data for the above referenced project for sample(s) received on 8/27/2020 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2008736

Work Order Summary

CLIENT:	Ms. Chris Kimmel Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	025116.120.412 Boeing of Portland
DATE RECEIVED:	08/27/2020	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	09/03/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVE-Inf-0820	TO-15	5.1 "Hg	14.7 psi
02A	SVE-Gac1-0820	TO-15	6.5 "Hg	15.1 psi
03A	SVE-Eff-0820	TO-15	3.7 "Hg	15.9 psi
04A	BOP-78i-0820	TO-15	4.3 "Hg	14.8 psi
05A	BOP-79i-0820	TO-15	3.7 "Hg	14.8 psi
06A	BOP-84i-0820	TO-15	3.7 "Hg	15.3 psi
07A	BOP-85i-0820	TO-15	7.6 "Hg	16.5 psi
08A	BOP-86i-0820	TO-15	5.5 "Hg	14.3 psi
09A	BOP-87i-0820	TO-15	7.1 "Hg	16.6 psi
10A	BOP-88i-0820	TO-15	8.2 "Hg	14.8 psi
11A	VOW-16-0820	TO-15	4.9 "Hg	15.1 psi
12A	VOW-17-0820	TO-15	5.1 "Hg	14.7 psi
13A	VOW-18-0820	TO-15	4.7 "Hg	15.3 psi
14A	Lab Blank	TO-15	NA	NA
15A	CCV	TO-15	NA	NA
16A	LCS	TO-15	NA	NA
16AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 09/03/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2008736

Thirteen 1 Liter Summa Canister samples were received on August 27, 2020. Thirteen 1 Liter Summa Canister samples were received on August 30, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on samples BOP-79i-0820 and BOP-86i-0820 due to the presence of high level non-target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SVE-Inf-0820

Lab ID#: 2008736-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	12	6.5	64
Tetrachloroethene	1.2	2.9	8.2	20

Client Sample ID: SVE-Gac1-0820

Lab ID#: 2008736-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.3	2.3	5.1	9.0
Trichloroethene	1.3	25	7.0	130
Tetrachloroethene	1.3	4.2	8.8	29

Client Sample ID: SVE-Eff-0820

Lab ID#: 2008736-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.2	3.0	4.7	12
Trichloroethene	1.2	2.0	6.4	11
Tetrachloroethene	1.2	4.4	8.0	30

Client Sample ID: BOP-78i-0820

Lab ID#: 2008736-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	5.6	6.3	30
Tetrachloroethene	1.2	8.7	7.9	59

Client Sample ID: BOP-79i-0820

Lab ID#: 2008736-05A

No Detections Were Found.

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: BOP-84i-0820

Lab ID#: 2008736-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	5.9	6.3	32
Tetrachloroethene	1.2	16	7.9	110

Client Sample ID: BOP-85i-0820

Lab ID#: 2008736-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.4	12	9.6	82

Client Sample ID: BOP-86i-0820

Lab ID#: 2008736-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	16	66	86	350
Tetrachloroethene	16	22	110	150

Client Sample ID: BOP-87i-0820

Lab ID#: 2008736-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.4	10	7.5	55
Tetrachloroethene	1.4	18	9.5	120

Client Sample ID: BOP-88i-0820

Lab ID#: 2008736-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.4	7.7	9.4	52

Client Sample ID: VOW-16-0820

Lab ID#: 2008736-11A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VOW-16-0820

Lab ID#: 2008736-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	1.3	6.6	7.2
Tetrachloroethene	1.2	6.3	8.2	43

Client Sample ID: VOW-17-0820

Lab ID#: 2008736-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	3.4	8.2	23

Client Sample ID: VOW-18-0820

Lab ID#: 2008736-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	9.0	8.2	61

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Client Sample ID: SVE-Inf-0820

Lab ID#: 2008736-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083115**	**Date of Collection:**	**8/20/20 1:55:00 PM**
Dil. Factor:	**2.41**	**Date of Analysis:**	**8/31/20 06:27 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	12	6.5	64
Tetrachloroethene	1.2	2.9	8.2	20

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: SVE-Gac1-0820

Lab ID#: 2008736-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083114**	**Date of Collection: 8/20/20 2:19:00 PM**	
Dil. Factor:	**2.59**	**Date of Analysis: 8/31/20 05:58 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	Not Detected	3.3	Not Detected
1,1-Dichloroethene	1.3	2.3	5.1	9.0
1,1,1-Trichloroethane	1.3	Not Detected	7.1	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.1	Not Detected
Trichloroethene	1.3	25	7.0	130
Tetrachloroethene	1.3	4.2	8.8	29

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: SVE-Eff-0820

Lab ID#: 2008736-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083113**	**Date of Collection: 8/20/20 2:10:00 PM**	
Dil. Factor:	**2.37**	**Date of Analysis: 8/31/20 05:29 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	3.0	4.7	12
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	2.0	6.4	11
Tetrachloroethene	1.2	4.4	8.0	30

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: BOP-78i-0820

Lab ID#: 2008736-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083117**	**Date of Collection:**	**8/21/20 3:38:00 PM**
Dil. Factor:	**2.34**	**Date of Analysis:**	**8/31/20 09:19 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	5.6	6.3	30
Tetrachloroethene	1.2	8.7	7.9	59

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-79i-0820

Lab ID#: 2008736-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083118**	**Date of Collection:**	**8/21/20 3:25:00 PM**
Dil. Factor:	**30.5**	**Date of Analysis:**	**8/31/20 09:47 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	15	Not Detected	39	Not Detected
1,1-Dichloroethene	15	Not Detected	60	Not Detected
1,1,1-Trichloroethane	15	Not Detected	83	Not Detected
cis-1,2-Dichloroethene	15	Not Detected	60	Not Detected
Trichloroethene	15	Not Detected	82	Not Detected
Tetrachloroethene	15	Not Detected	100	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-84i-0820

Lab ID#: 2008736-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083119**	**Date of Collection:**	**8/21/20 4:39:00 PM**
Dil. Factor:	**2.33**	**Date of Analysis:**	**8/31/20 10:16 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	5.9	6.3	32
Tetrachloroethene	1.2	16	7.9	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-85i-0820

Lab ID#: 2008736-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083120**	**Date of Collection:**	**8/21/20 4:20:00 PM**
Dil. Factor:	**2.84**	**Date of Analysis:**	**8/31/20 10:46 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.6	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.7	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.6	Not Detected
Trichloroethene	1.4	Not Detected	7.6	Not Detected
Tetrachloroethene	1.4	12	9.6	82

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: BOP-86i-0820

Lab ID#: 2008736-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083121**	**Date of Collection:**	**8/21/20 4:35:00 PM**
Dil. Factor:	**32.2**	**Date of Analysis:**	**8/31/20 11:13 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	16	Not Detected	41	Not Detected
1,1-Dichloroethene	16	Not Detected	64	Not Detected
1,1,1-Trichloroethane	16	Not Detected	88	Not Detected
cis-1,2-Dichloroethene	16	Not Detected	64	Not Detected
Trichloroethene	16	66	86	350
Tetrachloroethene	16	22	110	150

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-87i-0820

Lab ID#: 2008736-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083122**	**Date of Collection:**	**8/21/20 4:11:00 PM**
Dil. Factor:	**2.79**	**Date of Analysis:**	**8/31/20 11:43 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.4	Not Detected	3.6	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.5	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.6	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Trichloroethene	1.4	10	7.5	55
Tetrachloroethene	1.4	18	9.5	120

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: BOP-88i-0820

Lab ID#: 2008736-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083123**	**Date of Collection:**	**8/21/20 3:54:00 PM**
Dil. Factor:	**2.76**	**Date of Analysis:**	**9/1/20 12:12 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.4	Not Detected	3.5	Not Detected
1,1-Dichloroethene	1.4	Not Detected	5.5	Not Detected
1,1,1-Trichloroethane	1.4	Not Detected	7.5	Not Detected
cis-1,2-Dichloroethene	1.4	Not Detected	5.5	Not Detected
Trichloroethene	1.4	Not Detected	7.4	Not Detected
Tetrachloroethene	1.4	7.7	9.4	52

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: VOW-16-0820

Lab ID#: 2008736-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083124**	**Date of Collection: 8/21/20 2:31:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 9/1/20 12:41 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	1.3	6.6	7.2
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	6.3	8.2	43

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: VOW-17-0820

Lab ID#: 2008736-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083125**	**Date of Collection:**	**8/21/20 1:57:00 PM**
Dil. Factor:	**2.41**	**Date of Analysis:**	**9/1/20 01:11 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	3.4	8.2	23

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VOW-18-0820

Lab ID#: 2008736-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083126**	**Date of Collection: 8/21/20 2:17:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 9/1/20 01:40 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	9.0	8.2	61

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2008736-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083105c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/31/20 11:13 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CCV

Lab ID#: 2008736-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/31/20 09:49 AM**	

Compound	%Recovery
Vinyl Chloride	94
1,1-Dichloroethene	98
1,1,1-Trichloroethane	109
cis-1,2-Dichloroethene	98
Trichloroethene	100
Tetrachloroethene	105

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: LCS

Lab ID#: 2008736-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/31/20 10:16 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	87	70-130
1,1-Dichloroethene	90	70-130
1,1,1-Trichloroethane	94	70-130
cis-1,2-Dichloroethene	92	70-130
Trichloroethene	90	70-130
Tetrachloroethene	95	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCSD

Lab ID#: 2008736-16AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3083104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 8/31/20 10:44 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	86	70-130
1,1-Dichloroethene	93	70-130
1,1,1-Trichloroethane	94	70-130
cis-1,2-Dichloroethene	93	70-130
Trichloroethene	86	70-130
Tetrachloroethene	95	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	98	70-130

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9/3/2020
Ms. Chris Kimmel
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 025116.120.412
Workorder #: 2008737

Dear Ms. Chris Kimmel

The following report includes the data for the above referenced project for sample(s) received on 8/27/2020 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2008737

Work Order Summary

CLIENT:	Ms. Chris Kimmel Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	025116.120.412 Boeing of Portland
DATE RECEIVED:	08/27/2020	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	09/03/2020		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VP-1-0820	TO-15	4.5 "Hg	15 psi
02A	VP-2-0820	TO-15	4.0 "Hg	15 psi
03A	VP-3-0820	TO-15	1.5 "Hg	15 psi
04A	VP-4-0820	TO-15	3.5 "Hg	15 psi
05A	VP-5-0820	TO-15	5.0 "Hg	15 psi
06A	VP-6-0820	TO-15	3.5 "Hg	15 psi
07A	VP-7-0820	TO-15	6.0 "Hg	15 psi
08A	VP-8-0820	TO-15	5.0 "Hg	15 psi
09A	VP-9-0820	TO-15	2.0 "Hg	15 psi
10A	Lab Blank	TO-15	NA	NA
11A	CCV	TO-15	NA	NA
12A	LCS	TO-15	NA	NA
12AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 09/03/20

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209219, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-19-14, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-013, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2008737

Nine 1 Liter Summa Canister samples were received on August 27, 2020. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on samples VP-6-0820 and VP-8-0820 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-1-0820

Lab ID#: 2008737-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	1.3	6.4	6.9
Tetrachloroethene	1.2	4.2	8.1	29

Client Sample ID: VP-2-0820

Lab ID#: 2008737-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	5.2	7.9	36

Client Sample ID: VP-3-0820

Lab ID#: 2008737-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.1	1.7	5.8	9.5
Tetrachloroethene	1.1	3.6	7.2	24

Client Sample ID: VP-4-0820

Lab ID#: 2008737-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	6.2	6.2	33
Tetrachloroethene	1.1	8.9	7.8	60

Client Sample ID: VP-5-0820

Lab ID#: 2008737-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	9.6	6.5	52
Tetrachloroethene	1.2	8.7	8.2	59

Client Sample ID: VP-6-0820

Lab ID#: 2008737-06A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-6-0820

Lab ID#: 2008737-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	11	14	45	54
1,1,1-Trichloroethane	11	730	62	4000
Trichloroethene	11	130	62	690
Tetrachloroethene	11	13	78	87

Client Sample ID: VP-7-0820

Lab ID#: 2008737-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.3	1.7	5.0	6.9
1,1,1-Trichloroethane	1.3	43	6.9	240
cis-1,2-Dichloroethene	1.3	1.7	5.0	6.6
Trichloroethene	1.3	4.8	6.8	26
Tetrachloroethene	1.3	5.0	8.5	34

Client Sample ID: VP-8-0820

Lab ID#: 2008737-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	6.0	8.3	24	33
1,1,1-Trichloroethane	6.0	350	33	1900
cis-1,2-Dichloroethene	6.0	15	24	61
Trichloroethene	6.0	24	32	130
Tetrachloroethene	6.0	12	41	80

Client Sample ID: VP-9-0820

Lab ID#: 2008737-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	14	5.8	74
Tetrachloroethene	1.1	6.9	7.3	47

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Client Sample ID: VP-1-0820

Lab ID#: 2008737-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090207**	**Date of Collection: 8/21/20 1:36:00 PM**	
Dil. Factor:	**2.38**	**Date of Analysis: 9/2/20 03:47 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	1.3	6.4	6.9
Tetrachloroethene	1.2	4.2	8.1	29

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: VP-2-0820

Lab ID#: 2008737-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090208**	**Date of Collection: 8/21/20 1:06:00 PM**	
Dil. Factor:	**2.33**	**Date of Analysis: 9/2/20 04:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	5.2	7.9	36

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	110	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: VP-3-0820

Lab ID#: 2008737-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090209**	**Date of Collection:**	**8/21/20 12:22:00 PM**
Dil. Factor:	**2.13**	**Date of Analysis:**	**9/2/20 05:04 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.2	Not Detected
1,1,1-Trichloroethane	1.1	1.7	5.8	9.5
cis-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Trichloroethene	1.1	Not Detected	5.7	Not Detected
Tetrachloroethene	1.1	3.6	7.2	24

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: VP-4-0820

Lab ID#: 2008737-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090210**	**Date of Collection: 8/21/20 1:39:00 PM**	
Dil. Factor:	**2.29**	**Date of Analysis: 9/2/20 05:43 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	6.2	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	6.2	6.2	33
Tetrachloroethene	1.1	8.9	7.8	60

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: VP-5-0820

Lab ID#: 2008737-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090211**	**Date of Collection: 8/21/20 12:50:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 9/2/20 06:22 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	9.6	6.5	52
Tetrachloroethene	1.2	8.7	8.2	59

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: VP-6-0820

Lab ID#: 2008737-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090223**	**Date of Collection: 8/21/20 12:47:00 PM**	
Dil. Factor:	**22.9**	**Date of Analysis: 9/3/20 04:27 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	11	Not Detected	29	Not Detected
1,1-Dichloroethene	11	14	45	54
1,1,1-Trichloroethane	11	730	62	4000
cis-1,2-Dichloroethene	11	Not Detected	45	Not Detected
Trichloroethene	11	130	62	690
Tetrachloroethene	11	13	78	87

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	88	70-130

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Client Sample ID: VP-7-0820

Lab ID#: 2008737-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090212**	**Date of Collection:**	**8/21/20 11:48:00 AM**
Dil. Factor:	**2.52**	**Date of Analysis:**	**9/2/20 07:00 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	Not Detected	3.2	Not Detected
1,1-Dichloroethene	1.3	1.7	5.0	6.9
1,1,1-Trichloroethane	1.3	43	6.9	240
cis-1,2-Dichloroethene	1.3	1.7	5.0	6.6
Trichloroethene	1.3	4.8	6.8	26
Tetrachloroethene	1.3	5.0	8.5	34

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	94	70-130

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Client Sample ID: VP-8-0820

Lab ID#: 2008737-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090222**	**Date of Collection: 8/21/20 12:01:00 PM**	
Dil. Factor:	**12.1**	**Date of Analysis: 9/3/20 03:49 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	6.0	Not Detected	15	Not Detected
1,1-Dichloroethene	6.0	8.3	24	33
1,1,1-Trichloroethane	6.0	350	33	1900
cis-1,2-Dichloroethene	6.0	15	24	61
Trichloroethene	6.0	24	32	130
Tetrachloroethene	6.0	12	41	80

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	88	70-130

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Client Sample ID: VP-9-0820

Lab ID#: 2008737-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090221**	**Date of Collection: 8/21/20 1:51:00 PM**	
Dil. Factor:	**2.16**	**Date of Analysis: 9/3/20 03:10 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.8	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	14	5.8	74
Tetrachloroethene	1.1	6.9	7.3	47

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	106	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2008737-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090206c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/2/20 01:45 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	105	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	92	70-130

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Client Sample ID: CCV

Lab ID#: 2008737-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090202**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/2/20 10:49 AM**	

Compound	%Recovery
Vinyl Chloride	112
1,1-Dichloroethene	84
1,1,1-Trichloroethane	104
cis-1,2-Dichloroethene	93
Trichloroethene	108
Tetrachloroethene	106

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	109	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS

Lab ID#: 2008737-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/2/20 11:27 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	116	70-130
1,1-Dichloroethene	86	70-130
1,1,1-Trichloroethane	105	70-130
cis-1,2-Dichloroethene	84	70-130
Trichloroethene	115	70-130
Tetrachloroethene	107	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	110	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: LCSD

Lab ID#: 2008737-12AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**17090204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/2/20 12:06 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	116	70-130
1,1-Dichloroethene	87	70-130
1,1,1-Trichloroethane	106	70-130
cis-1,2-Dichloroethene	84	70-130
Trichloroethene	115	70-130
Tetrachloroethene	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	110	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	97	70-130

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3/2/2021

Ms. Evelyn Ives
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 002.5116.120.412
Workorder #: 2102568

Dear Ms. Evelyn Ives

The following report includes the data for the above referenced project for sample(s) received on 2/23/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2102568

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	002.5116.120.412 Boeing of Portland
DATE RECEIVED:	02/23/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/02/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SVE-Inf-0221	TO-15	5.0 "Hg	15 psi
02A	SVE-Gac1-0221	TO-15	4.5 "Hg	15 psi
03A	SVE-Eff-0221	TO-15	4.5 "Hg	15 psi
04A	BOP-78i-0221	TO-15	4.5 "Hg	15 psi
05A	BOP-79i-0221	TO-15	5.0 "Hg	15 psi
06A	BOP-84i-0221	TO-15	4.5 "Hg	15 psi
07A	BOP-85i-0221	TO-15	4.5 "Hg	15 psi
08A	BOP-86i-0221	TO-15	3.0 "Hg	15 psi
09A	BOP-87i-0221	TO-15	5.0 "Hg	15 psi
10A	BOP-88i-0221	TO-15	5.0 "Hg	15 psi
11A	VOW-16-0221	TO-15	3.0 "Hg	15 psi
12A	VOW-17-0221	TO-15	1.5 "Hg	15 psi
13A	VOW-18-0221	TO-15	4.0 "Hg	15 psi
14A	VP-1-0221	TO-15	5.0 "Hg	15 psi
15A	VP-2-0221	TO-15	5.0 "Hg	15 psi
16A	VP-3-0221	TO-15	3.5 "Hg	15 psi
17A	Lab Blank	TO-15	NA	NA
18A	CCV	TO-15	NA	NA
19A	LCS	TO-15	NA	NA
19AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 03/02/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2102568

Sixteen 1 Liter Summa Canister samples were received on February 23, 2021. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: SVE-Inf-0221

Lab ID#: 2102568-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	4.9	6.5	26
Tetrachloroethene	1.2	9.0	8.2	61

Client Sample ID: SVE-Gac1-0221

Lab ID#: 2102568-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	32	6.4	170

Client Sample ID: SVE-Eff-0221

Lab ID#: 2102568-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	19	6.4	100

Client Sample ID: BOP-78i-0221

Lab ID#: 2102568-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	2.0	6.5	11
Trichloroethene	1.2	8.5	6.4	46
Tetrachloroethene	1.2	6.4	8.1	43

Client Sample ID: BOP-79i-0221

Lab ID#: 2102568-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	2.0	6.5	11
Tetrachloroethene	1.2	4.8	8.2	33

Client Sample ID: BOP-84i-0221

Lab ID#: 2102568-06A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: BOP-84i-0221

Lab ID#: 2102568-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	4.3	6.4	23
Tetrachloroethene	1.2	43	8.1	290

Client Sample ID: BOP-85i-0221

Lab ID#: 2102568-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	22	8.1	150

Client Sample ID: BOP-86i-0221

Lab ID#: 2102568-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.1	1.5	6.1	8.3
cis-1,2-Dichloroethene	1.1	1.4	4.4	5.5
Trichloroethene	1.1	32	6.0	170
Tetrachloroethene	1.1	49	7.6	330

Client Sample ID: BOP-87i-0221

Lab ID#: 2102568-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	5.8	6.5	31
Tetrachloroethene	1.2	27	8.2	180

Client Sample ID: BOP-88i-0221

Lab ID#: 2102568-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	8.8	8.2	60

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VOW-16-0221

Lab ID#: 2102568-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	9.6	2.9	24
1,1-Dichloroethene	1.1	1.6	4.4	6.2
1,1,1-Trichloroethane	1.1	4.9	6.1	27
cis-1,2-Dichloroethene	1.1	5.2	4.4	20
Trichloroethene	1.1	39	6.0	210
Tetrachloroethene	1.1	6.4	7.6	44

Client Sample ID: VOW-17-0221

Lab ID#: 2102568-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	8.8	2.7	22
Trichloroethene	1.1	5.2	5.7	28
Tetrachloroethene	1.1	5.8	7.2	39

Client Sample ID: VOW-18-0221

Lab ID#: 2102568-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	1.2	6.4	6.4
Trichloroethene	1.2	50	6.3	270
Tetrachloroethene	1.2	16	7.9	110

Client Sample ID: VP-1-0221

Lab ID#: 2102568-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	9.1	8.2	62

Client Sample ID: VP-2-0221

Lab ID#: 2102568-15A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-2-0221

Lab ID#: 2102568-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	10	8.2	70

Client Sample ID: VP-3-0221

Lab ID#: 2102568-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.1	9.8	7.8	67

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Client Sample ID: SVE-Inf-0221

Lab ID#: 2102568-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022707**	**Date of Collection: 2/17/21 9:35:00 AM**	
Dil. Factor:	**2.42**	**Date of Analysis: 2/27/21 02:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	4.9	6.5	26
Tetrachloroethene	1.2	9.0	8.2	61

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: SVE-Gac1-0221

Lab ID#: 2102568-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022708**	**Date of Collection:**	**2/17/21 10:10:00 AM**
Dil. Factor:	**2.38**	**Date of Analysis:**	**2/27/21 03:11 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	32	6.4	170
Tetrachloroethene	1.2	Not Detected	8.1	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: SVE-Eff-0221

Lab ID#: 2102568-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022709**	**Date of Collection: 2/17/21 10:20:00 AM**	
Dil. Factor:	**2.38**	**Date of Analysis: 2/27/21 03:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	19	6.4	100
Tetrachloroethene	1.2	Not Detected	8.1	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-78i-0221

Lab ID#: 2102568-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022710**	**Date of Collection: 2/18/21 3:30:00 PM**	
Dil. Factor:	**2.40**	**Date of Analysis: 2/27/21 04:10 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	2.0	6.5	11
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	8.5	6.4	46
Tetrachloroethene	1.2	6.4	8.1	43

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	120	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-79i-0221

Lab ID#: 2102568-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022711**	**Date of Collection: 2/18/21 3:50:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 2/27/21 04:39 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	2.0	6.5	11
Tetrachloroethene	1.2	4.8	8.2	33

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-84i-0221

Lab ID#: 2102568-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022712**	**Date of Collection: 2/18/21 5:58:00 PM**	
Dil. Factor:	**2.38**	**Date of Analysis: 2/27/21 05:16 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	4.3	6.4	23
Tetrachloroethene	1.2	43	8.1	290

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	120	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-85i-0221

Lab ID#: 2102568-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022713**	**Date of Collection:**	**2/18/21 5:28:00 PM**
Dil. Factor:	**2.38**	**Date of Analysis:**	**2/27/21 05:45 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	22	8.1	150

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: BOP-86i-0221

Lab ID#: 2102568-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022714**	**Date of Collection:**	**2/18/21 5:44:00 PM**
Dil. Factor:	**2.24**	**Date of Analysis:**	**2/27/21 06:14 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.4	Not Detected
1,1,1-Trichloroethane	1.1	1.5	6.1	8.3
cis-1,2-Dichloroethene	1.1	1.4	4.4	5.5
Trichloroethene	1.1	32	6.0	170
Tetrachloroethene	1.1	49	7.6	330

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	121	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: BOP-87i-0221

Lab ID#: 2102568-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022718**	**Date of Collection: 2/18/21 4:26:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 2/27/21 09:42 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	5.8	6.5	31
Tetrachloroethene	1.2	27	8.2	180

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: BOP-88i-0221

Lab ID#: 2102568-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022719**	**Date of Collection: 2/18/21 4:07:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 2/27/21 10:12 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	8.8	8.2	60

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: VOW-16-0221

Lab ID#: 2102568-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022720**	**Date of Collection: 2/18/21 3:20:00 PM**	
Dil. Factor:	**2.24**	**Date of Analysis: 2/27/21 10:41 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	9.6	2.9	24
1,1-Dichloroethene	1.1	1.6	4.4	6.2
1,1,1-Trichloroethane	1.1	4.9	6.1	27
cis-1,2-Dichloroethene	1.1	5.2	4.4	20
Trichloroethene	1.1	39	6.0	210
Tetrachloroethene	1.1	6.4	7.6	44

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VOW-17-0221

Lab ID#: 2102568-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022721**	**Date of Collection: 2/18/21 3:55:00 PM**	
Dil. Factor:	**2.13**	**Date of Analysis: 2/27/21 11:10 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	8.8	2.7	22
1,1-Dichloroethene	1.1	Not Detected	4.2	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	5.8	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Trichloroethene	1.1	5.2	5.7	28
Tetrachloroethene	1.1	5.8	7.2	39

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	120	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: VOW-18-0221

Lab ID#: 2102568-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022722**	**Date of Collection:**	**2/18/21 4:15:00 PM**
Dil. Factor:	**2.33**	**Date of Analysis:**	**2/27/21 11:39 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	1.2	6.4	6.4
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	50	6.3	270
Tetrachloroethene	1.2	16	7.9	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: VP-1-0221

Lab ID#: 2102568-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022723**	**Date of Collection: 2/18/21 1:45:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 2/28/21 12:09 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	9.1	8.2	62

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: VP-2-0221

Lab ID#: 2102568-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022724**	**Date of Collection:**	**2/18/21 12:43:00 PM**
Dil. Factor:	**2.42**	**Date of Analysis:**	**2/28/21 12:38 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	10	8.2	70

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: VP-3-0221

Lab ID#: 2102568-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022725**	**Date of Collection: 2/18/21 6:23:00 PM**	
Dil. Factor:	**2.29**	**Date of Analysis: 2/28/21 01:07 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	6.2	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	Not Detected	6.2	Not Detected
Tetrachloroethene	1.1	9.8	7.8	67

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	119	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2102568-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022705**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/27/21 12:18 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: CCV

Lab ID#: 2102568-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022702**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/27/21 10:40 AM**	

Compound	%Recovery
Vinyl Chloride	128
1,1-Dichloroethene	115
1,1,1-Trichloroethane	108
cis-1,2-Dichloroethene	105
Trichloroethene	100
Tetrachloroethene	96

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS

Lab ID#: 2102568-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022703**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/27/21 11:08 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	124	70-130
1,1-Dichloroethene	117	70-130
1,1,1-Trichloroethane	107	70-130
cis-1,2-Dichloroethene	105	70-130
Trichloroethene	102	70-130
Tetrachloroethene	99	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 2102568-19AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022704**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/27/21 11:35 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	122	70-130
1,1-Dichloroethene	116	70-130
1,1,1-Trichloroethane	107	70-130
cis-1,2-Dichloroethene	105	70-130
Trichloroethene	100	70-130
Tetrachloroethene	96	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	100	70-130

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3/2/2021

Ms. Evelyn Ives
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 0025116.120.412
Workorder #: 2102581

Dear Ms. Evelyn Ives

The following report includes the data for the above referenced project for sample(s) received on 2/23/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2102581

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	0025116.120.412 Boeing of Portland
DATE RECEIVED:	02/23/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/02/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VP-4-0221	TO-15	4.7 "Hg	14.9 psi
02A	VP-5-0221	TO-15	3.7 "Hg	14.8 psi
03A	VP-6-0221	TO-15	4.5 "Hg	15 psi
04A	VP-7-0221	TO-15	4.7 "Hg	14.5 psi
05A	VP-8-0221	TO-15	3.9 "Hg	14.8 psi
06A	VP-9-0221	TO-15	2 "Hg	14.8 psi
07A	VP-10-0221	TO-15	3.7 "Hg	14.7 psi
08A	VP-11-0221	TO-15	4.3 "Hg	15 psi
09A	VP-12-0221	TO-15	3.9 "Hg	15 psi
10A	VP-13-0221	TO-15	4.5 "Hg	14.9 psi
11A	VP-14-0221	TO-15	5.1 "Hg	14.7 psi
12A	VP-15-0221	TO-15	4.5 "Hg	14.8 psi
13A	VP-16-0221	TO-15	3.9 "Hg	15.2 psi
14A	VP-17-0221	TO-15	4.3 "Hg	15.1 psi
15A	VP-18-0221	TO-15	0.4 "Hg	15 psi
16A	VP-19-0221	TO-15	4.7 "Hg	15 psi
17A	Lab Blank	TO-15	NA	NA
17B	Lab Blank	TO-15	NA	NA
18A	CCV	TO-15	NA	NA
18B	CCV	TO-15	NA	NA
19A	LCS	TO-15	NA	NA
19AA	LCSD	TO-15	NA	NA
19B	LCS	TO-15	NA	NA

Continued on next page

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WORK ORDER #: 2102581

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	0025116.120.412 Boeing of Portland
DATE RECEIVED:	02/23/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/02/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
19BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 03/02/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2102581

Sixteen 1 Liter Summa Canister samples were received on February 23, 2021. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

The Chain of Custody (COC) information for sample VP-6-0221 did not match the information on the canister with regard to canister barcode. The sample labeled 1L1184 on the COC is labeled as LC1184 on the canister. The client was notified of the discrepancy and the information on the canister was used to process and report the sample.

Analytical Notes

Dilution was performed on sample VP-6-0221 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-4-0221

Lab ID#: 2102581-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	2.7	6.4	15
Tetrachloroethene	1.2	14	8.1	92

Client Sample ID: VP-5-0221

Lab ID#: 2102581-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	3.5	6.2	19
Tetrachloroethene	1.1	13	7.8	87

Client Sample ID: VP-6-0221

Lab ID#: 2102581-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	3.0	9.7	12	38
1,1,1-Trichloroethane	3.0	740	16	4000
Trichloroethene	3.0	99	16	530
Tetrachloroethene	3.0	16	20	110

Client Sample ID: VP-7-0221

Lab ID#: 2102581-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.2	1.2	4.7	4.7
1,1,1-Trichloroethane	1.2	30	6.4	160
cis-1,2-Dichloroethene	1.2	1.2	4.7	4.8
Trichloroethene	1.2	2.7	6.3	14
Tetrachloroethene	1.2	8.5	8.0	58

Client Sample ID: VP-8-0221

Lab ID#: 2102581-05A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-8-0221

Lab ID#: 2102581-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.2	3.2	4.6	13
1,1,1-Trichloroethane	1.2	120	6.3	680
cis-1,2-Dichloroethene	1.2	4.1	4.6	16
Trichloroethene	1.2	6.4	6.2	34
Tetrachloroethene	1.2	21	7.8	140

Client Sample ID: VP-9-0221

Lab ID#: 2102581-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	5.3	5.8	28
Tetrachloroethene	1.1	7.8	7.3	53

Client Sample ID: VP-10-0221

Lab ID#: 2102581-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.1	2.6	6.1	14
Tetrachloroethene	1.1	16	7.7	110

Client Sample ID: VP-11-0221

Lab ID#: 2102581-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	1.3	6.3	6.8
Tetrachloroethene	1.2	16	8.0	110

Client Sample ID: VP-12-0221

Lab ID#: 2102581-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	44	7.9	300

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-13-0221

Lab ID#: 2102581-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	67	6.4	360
Tetrachloroethene	1.2	18	8.0	120

Client Sample ID: VP-14-0221

Lab ID#: 2102581-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	5.3	6.6	29
Trichloroethene	1.2	1.9	6.5	10
Tetrachloroethene	1.2	16	8.2	110

Client Sample ID: VP-15-0221

Lab ID#: 2102581-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	9.2	8.0	62

Client Sample ID: VP-16-0221

Lab ID#: 2102581-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	10	7.9	72

Client Sample ID: VP-17-0221

Lab ID#: 2102581-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	14	8.0	95

Client Sample ID: VP-18-0221

Lab ID#: 2102581-15A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-18-0221

Lab ID#: 2102581-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.0	16	7.0	110

Client Sample ID: VP-19-0221

Lab ID#: 2102581-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	17	8.1	120

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Client Sample ID: VP-4-0221

Lab ID#: 2102581-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030109**	**Date of Collection: 2/18/21 1:57:00 PM**	
Dil. Factor:	**2.39**	**Date of Analysis: 3/1/21 03:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	2.7	6.4	15
Tetrachloroethene	1.2	14	8.1	92

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: VP-5-0221

Lab ID#: 2102581-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030110**	**Date of Collection: 2/18/21 6:38:00 PM**	
Dil. Factor:	**2.29**	**Date of Analysis: 3/1/21 03:55 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	6.2	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	3.5	6.2	19
Tetrachloroethene	1.1	13	7.8	87

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	113	70-130

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Client Sample ID: VP-6-0221

Lab ID#: 2102581-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030111**	**Date of Collection: 2/18/21 11:55:00 AM**	
Dil. Factor:	**5.94**	**Date of Analysis: 3/1/21 04:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	3.0	Not Detected	7.6	Not Detected
1,1-Dichloroethene	3.0	9.7	12	38
1,1,1-Trichloroethane	3.0	740	16	4000
cis-1,2-Dichloroethene	3.0	Not Detected	12	Not Detected
Trichloroethene	3.0	99	16	530
Tetrachloroethene	3.0	16	20	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: VP-7-0221

Lab ID#: 2102581-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030112**	**Date of Collection: 2/18/21 4:28:00 PM**	
Dil. Factor:	**2.36**	**Date of Analysis: 3/1/21 04:53 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	1.2	4.7	4.7
1,1,1-Trichloroethane	1.2	30	6.4	160
cis-1,2-Dichloroethene	1.2	1.2	4.7	4.8
Trichloroethene	1.2	2.7	6.3	14
Tetrachloroethene	1.2	8.5	8.0	58

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	113	70-130

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Client Sample ID: VP-8-0221

Lab ID#: 2102581-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030113**	**Date of Collection: 2/18/21 11:05:00 AM**	
Dil. Factor:	**2.31**	**Date of Analysis: 3/1/21 05:22 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	3.2	4.6	13
1,1,1-Trichloroethane	1.2	120	6.3	680
cis-1,2-Dichloroethene	1.2	4.1	4.6	16
Trichloroethene	1.2	6.4	6.2	34
Tetrachloroethene	1.2	21	7.8	140

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: VP-9-0221

Lab ID#: 2102581-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030114**	**Date of Collection: 2/18/21 2:10:00 PM**	
Dil. Factor:	**2.15**	**Date of Analysis: 3/1/21 05:52 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.3	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	5.9	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.3	Not Detected
Trichloroethene	1.1	5.3	5.8	28
Tetrachloroethene	1.1	7.8	7.3	53

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: VP-10-0221

Lab ID#: 2102581-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030115**	**Date of Collection: 2/18/21 1:25:00 PM**	
Dil. Factor:	**2.28**	**Date of Analysis: 3/1/21 06:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	6.2	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	2.6	6.1	14
Tetrachloroethene	1.1	16	7.7	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: VP-11-0221

Lab ID#: 2102581-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030116**	**Date of Collection: 2/18/21 12:10:00 PM**	
Dil. Factor:	**2.36**	**Date of Analysis: 3/1/21 06:50 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	1.3	6.3	6.8
Tetrachloroethene	1.2	16	8.0	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: VP-12-0221

Lab ID#: 2102581-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030117**	**Date of Collection: 2/18/21 1:35:00 PM**	
Dil. Factor:	**2.32**	**Date of Analysis: 3/1/21 07:20 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	Not Detected	6.2	Not Detected
Tetrachloroethene	1.2	44	7.9	300

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: VP-13-0221

Lab ID#: 2102581-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022623**	**Date of Collection: 2/18/21 12:25:00 PM**	
Dil. Factor:	**2.37**	**Date of Analysis: 2/27/21 12:16 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	67	6.4	360
Tetrachloroethene	1.2	18	8.0	120

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VP-14-0221

Lab ID#: 2102581-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022624**	**Date of Collection: 2/18/21 11:45:00 AM**	
Dil. Factor:	**2.41**	**Date of Analysis: 2/27/21 12:45 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	5.3	6.6	29
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	1.9	6.5	10
Tetrachloroethene	1.2	16	8.2	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: VP-15-0221

Lab ID#: 2102581-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022625**	**Date of Collection:**	**2/18/21 11:25:00 AM**
Dil. Factor:	**2.36**	**Date of Analysis:**	**2/27/21 01:15 AM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	9.2	8.0	62

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VP-16-0221

Lab ID#: 2102581-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022626**	**Date of Collection: 2/18/21 1:10:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 2/27/21 01:44 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	10	7.9	72

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VP-17-0221

Lab ID#: 2102581-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022627**	**Date of Collection: 2/18/21 12:50:00 PM**	
Dil. Factor:	**2.37**	**Date of Analysis: 2/27/21 02:13 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	14	8.0	95

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: VP-18-0221

Lab ID#: 2102581-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022628**	**Date of Collection: 2/18/21 2:26:00 PM**	
Dil. Factor:	**2.05**	**Date of Analysis: 2/27/21 02:43 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.6	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Trichloroethene	1.0	Not Detected	5.5	Not Detected
Tetrachloroethene	1.0	16	7.0	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: VP-19-0221

Lab ID#: 2102581-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022629**	**Date of Collection: 2/18/21 2:40:00 PM**	
Dil. Factor:	**2.40**	**Date of Analysis: 2/27/21 03:12 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	17	8.1	120

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	118	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2102581-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022606**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/26/21 12:22 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2102581-17B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030105**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/1/21 11:28 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: CCV

Lab ID#: 2102581-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/26/21 10:07 AM**	

Compound	**%Recovery**
Vinyl Chloride	128
1,1-Dichloroethene	114
1,1,1-Trichloroethane	107
cis-1,2-Dichloroethene	105
Trichloroethene	100
Tetrachloroethene	99

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: CCV

Lab ID#: 2102581-18B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/1/21 10:04 AM**	

Compound	%Recovery
Vinyl Chloride	106
1,1-Dichloroethene	104
1,1,1-Trichloroethane	108
cis-1,2-Dichloroethene	100
Trichloroethene	102
Tetrachloroethene	114

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	108	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: LCS

Lab ID#: 2102581-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/26/21 10:34 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	120	70-130
1,1-Dichloroethene	114	70-130
1,1,1-Trichloroethane	106	70-130
cis-1,2-Dichloroethene	104	70-130
Trichloroethene	100	70-130
Tetrachloroethene	98	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	111	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCSD

Lab ID#: 2102581-19AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3022604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/26/21 11:02 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	118	70-130
1,1-Dichloroethene	113	70-130
1,1,1-Trichloroethane	105	70-130
cis-1,2-Dichloroethene	103	70-130
Trichloroethene	99	70-130
Tetrachloroethene	97	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCS

Lab ID#: 2102581-19B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030103**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/1/21 10:31 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	109	70-130
1,1-Dichloroethene	109	70-130
1,1,1-Trichloroethane	111	70-130
cis-1,2-Dichloroethene	103	70-130
Trichloroethene	102	70-130
Tetrachloroethene	114	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	114	70-130

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Client Sample ID: LCSD

Lab ID#: 2102581-19BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p030104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/1/21 10:59 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	103	70-130
1,1-Dichloroethene	112	70-130
1,1,1-Trichloroethane	111	70-130
cis-1,2-Dichloroethene	104	70-130
Trichloroethene	104	70-130
Tetrachloroethene	115	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	114	70-130

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3/5/2021
Ms. Evelyn Ives
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 25116120.412
Workorder #: 2102629

Dear Ms. Evelyn Ives

The following report includes the data for the above referenced project for sample(s) received on 2/26/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

WORK ORDER #: 2102629

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	25116120.412 Boeing of Portland
DATE RECEIVED:	02/26/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/05/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VOW-16-022421	TO-15	3.3 "Hg	15.3 psi
02A	VOW-17-022421	TO-15	4.3 "Hg	16 psi
03A	VOW-18-022421	TO-15	4.1 "Hg	16.2 psi
04A	VP-1-022421	TO-15	5.3 "Hg	15.8 psi
05A	VP-2-022421	TO-15	2.4 "Hg	16 psi
06A	VP-3-022421	TO-15	2.4 "Hg	16.4 psi
07A	VP-4-022421	TO-15	2.8 "Hg	16.2 psi
08A	VP-5-022421	TO-15	5.3 "Hg	15.3 psi
09A	VP-6-022421	TO-15	3.5 "Hg	15.4 psi
10A	VP-7-022421	TO-15	2.8 "Hg	16 psi
11A	VP-8-022421	TO-15	4.1 "Hg	15.7 psi
12A	VP-9-022421	TO-15	4.7 "Hg	15.7 psi
13A	VP-10-022421	TO-15	4.3 "Hg	15.5 psi
14A	VP-11-022421	TO-15	4.1 "Hg	14.9 psi
15A	VP-13-022421	TO-15	2.8 "Hg	16.6 psi
16A	VP-14-022421	TO-15	4.1 "Hg	16 psi
17A	VP-15-022421	TO-15	4.5 "Hg	15.4 psi
18A	VP-16-022421	TO-15	4.5 "Hg	15.9 psi
19A	VP-17-022421	TO-15	4.1 "Hg	14.8 psi
20A	VP-18-022421	TO-15	3.3 "Hg	16.5 psi
21A	VP-19-022421	TO-15	3.7 "Hg	15.4 psi
22A	Lab Blank	TO-15	NA	NA
22B	Lab Blank	TO-15	NA	NA

Continued on next page

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WORK ORDER #: 2102629

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	25116120.412 Boeing of Portland
DATE RECEIVED:	02/26/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/05/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
23A	CCV	TO-15	NA	NA
23B	CCV	TO-15	NA	NA
24A	LCS	TO-15	NA	NA
24AA	LCSD	TO-15	NA	NA
24B	LCS	TO-15	NA	NA
24BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 03/05/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2102629

Twenty-one 1 Liter Summa Canister samples were received on February 26, 2021. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on samples VP-6-022421 and VP-8-022421 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VOW-16-022421

Lab ID#: 2102629-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.1	1.7	6.2	9.3
Trichloroethene	1.1	1.2	6.2	6.3
Tetrachloroethene	1.1	3.7	7.8	25

Client Sample ID: VOW-17-022421

Lab ID#: 2102629-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	4.9	8.3	33

Client Sample ID: VOW-18-022421

Lab ID#: 2102629-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	6.5	6.5	35
Tetrachloroethene	1.2	9.6	8.2	65

Client Sample ID: VP-1-022421

Lab ID#: 2102629-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.3	1.6	6.8	8.6
Tetrachloroethene	1.3	9.2	8.5	63

Client Sample ID: VP-2-022421

Lab ID#: 2102629-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.1	11	7.7	74

Client Sample ID: VP-3-022421

Lab ID#: 2102629-06A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-3-022421

Lab ID#: 2102629-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	5.6	6.3	30
Trichloroethene	1.2	1.2	6.2	6.4
Tetrachloroethene	1.2	4.9	7.8	33

Client Sample ID: VP-4-022421

Lab ID#: 2102629-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	5.5	6.2	30
Tetrachloroethene	1.2	9.6	7.9	65

Client Sample ID: VP-5-022421

Lab ID#: 2102629-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	2.5	6.8	14
Trichloroethene	1.2	18	6.7	98
Tetrachloroethene	1.2	8.6	8.4	58

Client Sample ID: VP-6-022421

Lab ID#: 2102629-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	3.9	17	15	68
1,1,1-Trichloroethane	3.9	1000	21	5600
Trichloroethene	3.9	210	21	1100
Tetrachloroethene	3.9	14	26	96

Client Sample ID: VP-7-022421

Lab ID#: 2102629-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-7-022421

Lab ID#: 2102629-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.2	1.6	4.6	6.4
1,1,1-Trichloroethane	1.2	86	6.3	470
cis-1,2-Dichloroethene	1.2	2.0	4.6	8.1
Trichloroethene	1.2	7.6	6.2	41
Tetrachloroethene	1.2	5.6	7.8	38

Client Sample ID: VP-8-022421

Lab ID#: 2102629-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	2.7	7.1	10	28
1,1,1-Trichloroethane	2.7	540	14	3000
cis-1,2-Dichloroethene	2.7	15	10	58
Trichloroethene	2.7	28	14	150
Tetrachloroethene	2.7	21	18	140

Client Sample ID: VP-9-022421

Lab ID#: 2102629-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	4.5	6.6	24
Tetrachloroethene	1.2	11	8.3	74

Client Sample ID: VP-10-022421

Lab ID#: 2102629-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	1.2	7.6	6.4	40
Tetrachloroethene	1.2	11	8.1	74

Client Sample ID: VP-11-022421

Lab ID#: 2102629-14A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-11-022421

Lab ID#: 2102629-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	3.2	6.4	17
Trichloroethene	1.2	3.5	6.3	18
Tetrachloroethene	1.2	14	7.9	96

Client Sample ID: VP-13-022421

Lab ID#: 2102629-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	4.6	6.4	25
Trichloroethene	1.2	270	6.3	1500
Tetrachloroethene	1.2	19	8.0	130

Client Sample ID: VP-14-022421

Lab ID#: 2102629-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	17	6.6	92
Trichloroethene	1.2	8.4	6.5	45
Tetrachloroethene	1.2	13	8.2	91

Client Sample ID: VP-15-022421

Lab ID#: 2102629-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.2	2.0	6.6	11
Tetrachloroethene	1.2	10	8.2	70

Client Sample ID: VP-16-022421

Lab ID#: 2102629-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	14	8.3	97

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-17-022421

Lab ID#: 2102629-19A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	16	7.9	100

Client Sample ID: VP-18-022421

Lab ID#: 2102629-20A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	8.0	8.1	54

Client Sample ID: VP-19-022421

Lab ID#: 2102629-21A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.2	4.4	7.9	30

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Client Sample ID: VOW-16-022421

Lab ID#: 2102629-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030206**	**Date of Collection: 2/24/21 10:00:00 AM**	
Dil. Factor:	**2.29**	**Date of Analysis: 3/2/21 03:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
1,1,1-Trichloroethane	1.1	1.7	6.2	9.3
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	1.2	6.2	6.3
Tetrachloroethene	1.1	3.7	7.8	25

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VOW-17-022421

Lab ID#: 2102629-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030207**	**Date of Collection: 2/24/21 10:13:00 AM**	
Dil. Factor:	**2.44**	**Date of Analysis: 3/2/21 04:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.6	Not Detected
Tetrachloroethene	1.2	4.9	8.3	33

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VOW-18-022421

Lab ID#: 2102629-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030208**	**Date of Collection: 2/24/21 10:27:00 AM**	
Dil. Factor:	**2.43**	**Date of Analysis: 3/2/21 04:38 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.6	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	6.5	6.5	35
Tetrachloroethene	1.2	9.6	8.2	65

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-1-022421

Lab ID#: 2102629-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030209**	**Date of Collection: 2/24/21 10:45:00 AM**	
Dil. Factor:	**2.52**	**Date of Analysis: 3/2/21 05:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.3	Not Detected	3.2	Not Detected
1,1-Dichloroethene	1.3	Not Detected	5.0	Not Detected
1,1,1-Trichloroethane	1.3	Not Detected	6.9	Not Detected
cis-1,2-Dichloroethene	1.3	Not Detected	5.0	Not Detected
Trichloroethene	1.3	1.6	6.8	8.6
Tetrachloroethene	1.3	9.2	8.5	63

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-2-022421

Lab ID#: 2102629-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030210**	**Date of Collection: 2/24/21 11:08:00 AM**	
Dil. Factor:	**2.27**	**Date of Analysis: 3/2/21 05:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.5	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	6.2	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.5	Not Detected
Trichloroethene	1.1	Not Detected	6.1	Not Detected
Tetrachloroethene	1.1	11	7.7	74

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-3-022421

Lab ID#: 2102629-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030211**	**Date of Collection: 2/24/21 11:09:00 AM**	
Dil. Factor:	**2.30**	**Date of Analysis: 3/2/21 06:06 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	5.6	6.3	30
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	1.2	6.2	6.4
Tetrachloroethene	1.2	4.9	7.8	33

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VP-4-022421

Lab ID#: 2102629-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030212**	**Date of Collection: 2/24/21 11:11:00 AM**	
Dil. Factor:	**2.32**	**Date of Analysis: 3/2/21 06:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	5.5	6.2	30
Tetrachloroethene	1.2	9.6	7.9	65

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VP-5-022421

Lab ID#: 2102629-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030213**	**Date of Collection: 2/24/21 11:12:00 AM**	
Dil. Factor:	**2.48**	**Date of Analysis: 3/2/21 07:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.2	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.9	Not Detected
1,1,1-Trichloroethane	1.2	2.5	6.8	14
cis-1,2-Dichloroethene	1.2	Not Detected	4.9	Not Detected
Trichloroethene	1.2	18	6.7	98
Tetrachloroethene	1.2	8.6	8.4	58

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	98	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-6-022421

Lab ID#: 2102629-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030224**	**Date of Collection: 2/24/21 11:36:00 AM**	
Dil. Factor:	**7.73**	**Date of Analysis: 3/3/21 02:10 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	3.9	Not Detected	9.9	Not Detected
1,1-Dichloroethene	3.9	17	15	68
1,1,1-Trichloroethane	3.9	1000	21	5600
cis-1,2-Dichloroethene	3.9	Not Detected	15	Not Detected
Trichloroethene	3.9	210	21	1100
Tetrachloroethene	3.9	14	26	96

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-7-022421

Lab ID#: 2102629-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030216**	**Date of Collection: 2/24/21 11:48:00 AM**	
Dil. Factor:	**2.30**	**Date of Analysis: 3/2/21 10:21 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.2	1.6	4.6	6.4
1,1,1-Trichloroethane	1.2	86	6.3	470
cis-1,2-Dichloroethene	1.2	2.0	4.6	8.1
Trichloroethene	1.2	7.6	6.2	41
Tetrachloroethene	1.2	5.6	7.8	38

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-8-022421

Lab ID#: 2102629-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030217**	**Date of Collection: 2/24/21 11:46:00 AM**	
Dil. Factor:	**5.32**	**Date of Analysis: 3/2/21 10:48 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	2.7	Not Detected	6.8	Not Detected
1,1-Dichloroethene	2.7	7.1	10	28
1,1,1-Trichloroethane	2.7	540	14	3000
cis-1,2-Dichloroethene	2.7	15	10	58
Trichloroethene	2.7	28	14	150
Tetrachloroethene	2.7	21	18	140

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-9-022421

Lab ID#: 2102629-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030218**	**Date of Collection: 2/24/21 11:33:00 AM**	
Dil. Factor:	**2.45**	**Date of Analysis: 3/2/21 11:18 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	4.5	6.6	24
Tetrachloroethene	1.2	11	8.3	74

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: VP-10-022421

Lab ID#: 2102629-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030219**	**Date of Collection: 2/24/21 12:51:00 PM**	
Dil. Factor:	**2.40**	**Date of Analysis: 3/2/21 11:47 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	7.6	6.4	40
Tetrachloroethene	1.2	11	8.1	74

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: VP-11-022421

Lab ID#: 2102629-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030220**	**Date of Collection: 2/24/21 2:48:00 PM**	
Dil. Factor:	**2.33**	**Date of Analysis: 3/3/21 12:16 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	3.2	6.4	17
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	3.5	6.3	18
Tetrachloroethene	1.2	14	7.9	96

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-13-022421

Lab ID#: 2102629-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030228**	**Date of Collection: 2/24/21 2:50:00 PM**	
Dil. Factor:	**2.35**	**Date of Analysis: 3/3/21 07:48 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	4.6	6.4	25
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	270	6.3	1500
Tetrachloroethene	1.2	19	8.0	130

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	101	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: VP-14-022421

Lab ID#: 2102629-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030222**	**Date of Collection: 2/24/21 3:36:00 PM**	
Dil. Factor:	**2.42**	**Date of Analysis: 3/3/21 01:13 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	17	6.6	92
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	8.4	6.5	45
Tetrachloroethene	1.2	13	8.2	91

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-15-022421

Lab ID#: 2102629-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030223**	**Date of Collection: 2/24/21 3:40:00 PM**	
Dil. Factor:	**2.41**	**Date of Analysis: 3/3/21 01:42 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	2.0	6.6	11
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.5	Not Detected
Tetrachloroethene	1.2	10	8.2	70

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: VP-16-022421

Lab ID#: 2102629-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030225**	**Date of Collection: 2/24/21 3:53:00 PM**	
Dil. Factor:	**2.45**	**Date of Analysis: 3/3/21 02:39 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.1	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.8	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.7	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.8	Not Detected
Trichloroethene	1.2	Not Detected	6.6	Not Detected
Tetrachloroethene	1.2	14	8.3	97

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	92	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-17-022421

Lab ID#: 2102629-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030226**	**Date of Collection: 2/24/21 3:55:00 PM**	
Dil. Factor:	**2.32**	**Date of Analysis: 3/3/21 03:09 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.3	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	Not Detected	6.2	Not Detected
Tetrachloroethene	1.2	16	7.9	100

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	95	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: VP-18-022421

Lab ID#: 2102629-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030227**	**Date of Collection: 2/24/21 4:16:00 PM**	
Dil. Factor:	**2.38**	**Date of Analysis: 3/3/21 03:38 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.7	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.5	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.7	Not Detected
Trichloroethene	1.2	Not Detected	6.4	Not Detected
Tetrachloroethene	1.2	8.0	8.1	54

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: VP-19-022421

Lab ID#: 2102629-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030306**	**Date of Collection: 2/24/21 4:18:00 PM**	
Dil. Factor:	**2.34**	**Date of Analysis: 3/3/21 01:11 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.2	Not Detected	3.0	Not Detected
1,1-Dichloroethene	1.2	Not Detected	4.6	Not Detected
1,1,1-Trichloroethane	1.2	Not Detected	6.4	Not Detected
cis-1,2-Dichloroethene	1.2	Not Detected	4.6	Not Detected
Trichloroethene	1.2	Not Detected	6.3	Not Detected
Tetrachloroethene	1.2	4.4	7.9	30

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	93	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2102629-22A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030205a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/2/21 02:28 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	97	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2102629-22B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030305c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/3/21 12:02 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 2102629-23A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030202**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/2/21 12:50 PM**	

Compound	%Recovery
Vinyl Chloride	97
1,1-Dichloroethene	101
1,1,1-Trichloroethane	99
cis-1,2-Dichloroethene	98
Trichloroethene	104
Tetrachloroethene	103

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: CCV

Lab ID#: 2102629-23B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030302**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/3/21 10:29 AM**	

Compound	%Recovery
Vinyl Chloride	88
1,1-Dichloroethene	97
1,1,1-Trichloroethane	99
cis-1,2-Dichloroethene	99
Trichloroethene	104
Tetrachloroethene	104

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	91	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: LCS

Lab ID#: 2102629-24A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030203**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/2/21 01:18 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	88	70-130
1,1-Dichloroethene	101	70-130
1,1,1-Trichloroethane	100	70-130
cis-1,2-Dichloroethene	102	70-130
Trichloroethene	104	70-130
Tetrachloroethene	103	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCSD

Lab ID#: 2102629-24AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030204**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/2/21 01:46 PM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	89	70-130
1,1-Dichloroethene	103	70-130
1,1,1-Trichloroethane	100	70-130
cis-1,2-Dichloroethene	103	70-130
Trichloroethene	103	70-130
Tetrachloroethene	105	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	96	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: LCS

Lab ID#: 2102629-24B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030303**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/3/21 10:57 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	81	70-130
1,1-Dichloroethene	96	70-130
1,1,1-Trichloroethane	98	70-130
cis-1,2-Dichloroethene	98	70-130
Trichloroethene	104	70-130
Tetrachloroethene	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	91	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: LCSD

Lab ID#: 2102629-24BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**3030304**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/3/21 11:24 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	83	70-130
1,1-Dichloroethene	100	70-130
1,1,1-Trichloroethane	99	70-130
cis-1,2-Dichloroethene	98	70-130
Trichloroethene	101	70-130
Tetrachloroethene	104	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	104	70-130
1,2-Dichloroethane-d4	94	70-130
4-Bromofluorobenzene	104	70-130

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3/29/2021
Ms. Evelyn Ives
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 25116.120.210
Workorder #: 2103613

Dear Ms. Evelyn Ives

The following report includes the data for the above referenced project for sample(s) received on 3/22/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2103613

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	25116.120.210 Boeing of Portland
DATE RECEIVED:	03/22/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/29/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VOW-16-031821	TO-15	5.5 "Hg	10 psi
02A	VOW-17-031821	TO-15	5.5 "Hg	10 psi
03A	VOW-18-031821	TO-15	5.0 "Hg	10 psi
04A	VP-1-031821	TO-15	5.5 "Hg	10 psi
05A	VP-2-031821	TO-15	6.5 "Hg	10 psi
06A	VP-3-031821	TO-15	4.5 "Hg	10 psi
07A	VP-4-031821	TO-15	4.0 "Hg	10 psi
08A	VP-5-031821	TO-15	4.5 "Hg	10 psi
09A	VP-6-031821	TO-15	4.5 "Hg	10 psi
10A	VP-7-031821	TO-15	3.5 "Hg	10 psi
11A	VP-8-031821	TO-15	5.5 "Hg	10 psi
12A	VP-9-031821	TO-15	5.0 "Hg	10 psi
13A	VP-10-031821	TO-15	5.5 "Hg	10 psi
14A	VP-11-031821	TO-15	5.0 "Hg	10 psi
15A	VP-13-031821	TO-15	5.0 "Hg	11 psi
16A	VP-14-031821	TO-15	5.5 "Hg	10 psi
17A	VP-15-031821	TO-15	5.0 "Hg	10 psi
18A	VP-16-031821	TO-15	4.5 "Hg	11 psi
19A	VP-17-031821	TO-15	4.5 "Hg	10 psi
20A	VP-18-031821	TO-15	5.0 "Hg	10 psi
21A	VP-19-031821	TO-15	5.0 "Hg	10 psi
22A	Lab Blank	TO-15	NA	NA
22B	Lab Blank	TO-15	NA	NA

Continued on next page

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WORK ORDER #: 2103613

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	25116.120.210 Boeing of Portland
DATE RECEIVED:	03/22/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	03/29/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
23A	CCV	TO-15	NA	NA
23B	CCV	TO-15	NA	NA
24A	LCS	TO-15	NA	NA
24AA	LCSD	TO-15	NA	NA
24B	LCS	TO-15	NA	NA
24BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 03/29/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2103613

Twenty-one 1 Liter Summa Canister samples were received on March 22, 2021. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

The Chain of Custody (COC) information for samples VOW-16-031821 and VOW-17-031821 did not match the information on the canister with regard to canister barcode. The samples labeled 1L1519 and 1L2790 on the COC are labeled as 1L1591 and 1L2760 on the canister. The client was notified of the discrepancy and the information on the canister was used to process and report the samples.

Analytical Notes

Dilution was performed on samples VP-6-031821, VP-7-031821 and VP-13-031821 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VOW-16-031821

Lab ID#: 2103613-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	4.1	27	10	70
cis-1,2-Dichloroethene	4.1	14	16	55
Trichloroethene	4.1	41	22	220
Tetrachloroethene	4.1	7.1	28	48

Client Sample ID: VOW-17-031821

Lab ID#: 2103613-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	54	2.6	140
1,1-Dichloroethene	1.0	1.6	4.1	6.2
1,1,1-Trichloroethane	1.0	1.6	5.6	8.8
cis-1,2-Dichloroethene	1.0	5.2	4.1	21
Trichloroethene	1.0	73	5.5	390
Tetrachloroethene	1.0	8.9	7.0	60

Client Sample ID: VOW-18-031821

Lab ID#: 2103613-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	3.1	5.5	17
Trichloroethene	1.0	44	5.4	230
Tetrachloroethene	1.0	14	6.8	96

Client Sample ID: VP-1-031821

Lab ID#: 2103613-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	2.3	2.6	5.9
1,1,1-Trichloroethane	1.0	1.1	5.6	5.9
Trichloroethene	1.0	55	5.5	300
Tetrachloroethene	1.0	12	7.0	85

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-2-031821

Lab ID#: 2103613-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.1	21	7.2	140

Client Sample ID: VP-3-031821

Lab ID#: 2103613-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.99	38	5.4	210
Trichloroethene	0.99	7.8	5.3	42
Tetrachloroethene	0.99	10	6.7	70

Client Sample ID: VP-4-031821

Lab ID#: 2103613-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.97	1.6	5.3	8.6
Trichloroethene	0.97	12	5.2	68
Tetrachloroethene	0.97	12	6.6	81

Client Sample ID: VP-5-031821

Lab ID#: 2103613-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.99	12	5.4	66
Trichloroethene	0.99	330	5.3	1800
Tetrachloroethene	0.99	21	6.7	140

Client Sample ID: VP-6-031821

Lab ID#: 2103613-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	7.9	36	31	140
1,1,1-Trichloroethane	7.9	2400	43	13000

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-6-031821

Lab ID#: 2103613-09A

Trichloroethene	7.9	540	42	2900
Tetrachloroethene	7.9	30	54	200

Client Sample ID: VP-7-031821

Lab ID#: 2103613-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	0.95	2.3	3.8	9.1
1,1,1-Trichloroethane	0.95	210	5.2	1200
cis-1,2-Dichloroethene	0.95	3.6	3.8	14
Trichloroethene	0.95	15	5.1	82
Tetrachloroethene	0.95	11	6.4	72

Client Sample ID: VP-8-031821

Lab ID#: 2103613-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	2.9	3.9	12	16
1,1,1-Trichloroethane	2.9	910	16	5000
cis-1,2-Dichloroethene	2.9	9.7	12	38
Trichloroethene	2.9	37	16	200
Tetrachloroethene	2.9	21	20	140

Client Sample ID: VP-9-031821

Lab ID#: 2103613-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	2.3	5.5	12
Trichloroethene	1.0	6.3	5.4	34
Tetrachloroethene	1.0	11	6.8	74

Client Sample ID: VP-10-031821

Lab ID#: 2103613-13A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-10-031821

Lab ID#: 2103613-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	3.5	5.6	19
Trichloroethene	1.0	29	5.5	160
Tetrachloroethene	1.0	15	7.0	100

Client Sample ID: VP-11-031821

Lab ID#: 2103613-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	14	5.5	78
Trichloroethene	1.0	9.1	5.4	49
Tetrachloroethene	1.0	14	6.8	98

Client Sample ID: VP-13-031821

Lab ID#: 2103613-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	4.2	16	23	90
Trichloroethene	4.2	1200	22	6400
Tetrachloroethene	4.2	35	28	230

Client Sample ID: VP-14-031821

Lab ID#: 2103613-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	65	5.6	360
Trichloroethene	1.0	35	5.5	190
Tetrachloroethene	1.0	21	7.0	140

Client Sample ID: VP-15-031821

Lab ID#: 2103613-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-15-031821

Lab ID#: 2103613-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	26	5.5	140
Trichloroethene	1.0	3.2	5.4	17
Tetrachloroethene	1.0	14	6.8	94

Client Sample ID: VP-16-031821

Lab ID#: 2103613-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	1.2	2.6	3.2
Trichloroethene	1.0	4.3	5.5	23
Tetrachloroethene	1.0	17	7.0	110

Client Sample ID: VP-17-031821

Lab ID#: 2103613-19A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	1.5	2.5	3.9
1,1,1-Trichloroethane	0.99	1.1	5.4	5.9
Trichloroethene	0.99	3.6	5.3	19
Tetrachloroethene	0.99	20	6.7	130

Client Sample ID: VP-18-031821

Lab ID#: 2103613-20A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.0	7.2	6.8	49

Client Sample ID: VP-19-031821

Lab ID#: 2103613-21A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.0	4.1	6.8	28

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Client Sample ID: VOW-16-031821

Lab ID#: 2103613-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032606**	**Date of Collection: 3/18/21 10:48:00 AM**	
Dil. Factor:	**8.23**	**Date of Analysis: 3/26/21 02:10 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	4.1	27	10	70
1,1-Dichloroethene	4.1	Not Detected	16	Not Detected
1,1,1-Trichloroethane	4.1	Not Detected	22	Not Detected
cis-1,2-Dichloroethene	4.1	14	16	55
Trichloroethene	4.1	41	22	220
Tetrachloroethene	4.1	7.1	28	48

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	90	70-130
1,2-Dichloroethane-d4	112	70-130
4-Bromofluorobenzene	109	70-130

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Client Sample ID: VOW-17-031821

Lab ID#: 2103613-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032607**	**Date of Collection: 3/18/21 10:59:00 AM**	
Dil. Factor:	**2.06**	**Date of Analysis: 3/26/21 02:40 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	54	2.6	140
1,1-Dichloroethene	1.0	1.6	4.1	6.2
1,1,1-Trichloroethane	1.0	1.6	5.6	8.8
cis-1,2-Dichloroethene	1.0	5.2	4.1	21
Trichloroethene	1.0	73	5.5	390
Tetrachloroethene	1.0	8.9	7.0	60

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: VOW-18-031821

Lab ID#: 2103613-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032608**	**Date of Collection: 3/18/21 11:35:00 AM**	
Dil. Factor:	**2.02**	**Date of Analysis: 3/26/21 03:09 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	3.1	5.5	17
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	44	5.4	230
Tetrachloroethene	1.0	14	6.8	96

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	113	70-130

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Client Sample ID: VP-1-031821

Lab ID#: 2103613-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032609**	**Date of Collection: 3/18/21 11:08:00 AM**	
Dil. Factor:	**2.06**	**Date of Analysis: 3/26/21 03:38 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	2.3	2.6	5.9
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	1.1	5.6	5.9
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Trichloroethene	1.0	55	5.5	300
Tetrachloroethene	1.0	12	7.0	85

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: VP-2-031821

Lab ID#: 2103613-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032610**	**Date of Collection: 3/18/21 12:20:00 PM**	
Dil. Factor:	**2.14**	**Date of Analysis: 3/26/21 04:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.7	Not Detected
1,1-Dichloroethene	1.1	Not Detected	4.2	Not Detected
1,1,1-Trichloroethane	1.1	Not Detected	5.8	Not Detected
cis-1,2-Dichloroethene	1.1	Not Detected	4.2	Not Detected
Trichloroethene	1.1	Not Detected	5.8	Not Detected
Tetrachloroethene	1.1	21	7.2	140

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	113	70-130

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Client Sample ID: VP-3-031821

Lab ID#: 2103613-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032611**	**Date of Collection: 3/18/21 12:25:00 PM**	
Dil. Factor:	**1.98**	**Date of Analysis: 3/26/21 04:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.99	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.99	38	5.4	210
cis-1,2-Dichloroethene	0.99	Not Detected	3.9	Not Detected
Trichloroethene	0.99	7.8	5.3	42
Tetrachloroethene	0.99	10	6.7	70

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	113	70-130

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Client Sample ID: VP-4-031821

Lab ID#: 2103613-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032612**	**Date of Collection: 3/18/21 12:29:00 PM**	
Dil. Factor:	**1.94**	**Date of Analysis: 3/26/21 05:07 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.97	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.97	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.97	1.6	5.3	8.6
cis-1,2-Dichloroethene	0.97	Not Detected	3.8	Not Detected
Trichloroethene	0.97	12	5.2	68
Tetrachloroethene	0.97	12	6.6	81

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: VP-5-031821

Lab ID#: 2103613-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032613**	**Date of Collection: 3/18/21 12:34:00 PM**	
Dil. Factor:	**1.98**	**Date of Analysis: 3/26/21 05:36 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.99	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.99	12	5.4	66
cis-1,2-Dichloroethene	0.99	Not Detected	3.9	Not Detected
Trichloroethene	0.99	330	5.3	1800
Tetrachloroethene	0.99	21	6.7	140

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: VP-6-031821

Lab ID#: 2103613-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032614**	**Date of Collection: 3/18/21 12:36:00 PM**	
Dil. Factor:	**15.8**	**Date of Analysis: 3/26/21 06:04 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	7.9	Not Detected	20	Not Detected
1,1-Dichloroethene	7.9	36	31	140
1,1,1-Trichloroethane	7.9	2400	43	13000
cis-1,2-Dichloroethene	7.9	Not Detected	31	Not Detected
Trichloroethene	7.9	540	42	2900
Tetrachloroethene	7.9	30	54	200

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: VP-7-031821

Lab ID#: 2103613-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032617**	**Date of Collection: 3/18/21 12:53:00 PM**	
Dil. Factor:	**1.90**	**Date of Analysis: 3/26/21 08:59 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.95	Not Detected	2.4	Not Detected
1,1-Dichloroethene	0.95	2.3	3.8	9.1
1,1,1-Trichloroethane	0.95	210	5.2	1200
cis-1,2-Dichloroethene	0.95	3.6	3.8	14
Trichloroethene	0.95	15	5.1	82
Tetrachloroethene	0.95	11	6.4	72

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	118	70-130

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Client Sample ID: VP-8-031821

Lab ID#: 2103613-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032615**	**Date of Collection: 3/18/21 12:51:00 PM**	
Dil. Factor:	**5.88**	**Date of Analysis: 3/26/21 06:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	2.9	Not Detected	7.5	Not Detected
1,1-Dichloroethene	2.9	3.9	12	16
1,1,1-Trichloroethane	2.9	910	16	5000
cis-1,2-Dichloroethene	2.9	9.7	12	38
Trichloroethene	2.9	37	16	200
Tetrachloroethene	2.9	21	20	140

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	117	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: VP-9-031821

Lab ID#: 2103613-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032618**	**Date of Collection: 3/18/21 12:38:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 3/26/21 09:29 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	2.3	5.5	12
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	6.3	5.4	34
Tetrachloroethene	1.0	11	6.8	74

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: VP-10-031821

Lab ID#: 2103613-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032619**	**Date of Collection: 3/18/21 1:57:00 PM**	
Dil. Factor:	**2.06**	**Date of Analysis: 3/26/21 09:58 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	3.5	5.6	19
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Trichloroethene	1.0	29	5.5	160
Tetrachloroethene	1.0	15	7.0	100

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: VP-11-031821

Lab ID#: 2103613-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032620**	**Date of Collection: 3/18/21 2:01:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 3/26/21 10:27 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	14	5.5	78
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	9.1	5.4	49
Tetrachloroethene	1.0	14	6.8	98

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: VP-13-031821

Lab ID#: 2103613-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032616**	**Date of Collection: 3/18/21 2:03:00 PM**	
Dil. Factor:	**8.39**	**Date of Analysis: 3/26/21 07:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	4.2	Not Detected	11	Not Detected
1,1-Dichloroethene	4.2	Not Detected	17	Not Detected
1,1,1-Trichloroethane	4.2	16	23	90
cis-1,2-Dichloroethene	4.2	Not Detected	17	Not Detected
Trichloroethene	4.2	1200	22	6400
Tetrachloroethene	4.2	35	28	230

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: VP-14-031821

Lab ID#: 2103613-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032621**	**Date of Collection: 3/18/21 2:12:00 PM**	
Dil. Factor:	**2.06**	**Date of Analysis: 3/26/21 10:57 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	65	5.6	360
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Trichloroethene	1.0	35	5.5	190
Tetrachloroethene	1.0	21	7.0	140

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: VP-15-031821

Lab ID#: 2103613-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032622**	**Date of Collection: 3/18/21 2:14:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 3/26/21 11:26 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	26	5.5	140
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	3.2	5.4	17
Tetrachloroethene	1.0	14	6.8	94

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: VP-16-031821

Lab ID#: 2103613-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032623**	**Date of Collection: 3/18/21 2:18:00 PM**	
Dil. Factor:	**2.06**	**Date of Analysis: 3/26/21 11:56 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	1.2	2.6	3.2
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.6	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Trichloroethene	1.0	4.3	5.5	23
Tetrachloroethene	1.0	17	7.0	110

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	115	70-130

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Client Sample ID: VP-17-031821

Lab ID#: 2103613-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032624**	**Date of Collection: 3/18/21 2:17:00 PM**	
Dil. Factor:	**1.98**	**Date of Analysis: 3/27/21 12:25 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	1.5	2.5	3.9
1,1-Dichloroethene	0.99	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.99	1.1	5.4	5.9
cis-1,2-Dichloroethene	0.99	Not Detected	3.9	Not Detected
Trichloroethene	0.99	3.6	5.3	19
Tetrachloroethene	0.99	20	6.7	130

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	113	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: VP-18-031821

Lab ID#: 2103613-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032625**	**Date of Collection: 3/18/21 2:32:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 3/27/21 12:54 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.5	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	Not Detected	5.4	Not Detected
Tetrachloroethene	1.0	7.2	6.8	49

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	116	70-130

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Client Sample ID: VP-19-031821

Lab ID#: 2103613-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j032607**	**Date of Collection: 3/18/21 2:40:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 3/26/21 01:24 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.5	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	Not Detected	5.4	Not Detected
Tetrachloroethene	1.0	4.1	6.8	28

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2103613-22A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032605**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 12:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	93	70-130
1,2-Dichloroethane-d4	114	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2103613-22B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j032606**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 11:10 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: CCV

Lab ID#: 2103613-23A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 10:59 AM**	

Compound	%Recovery
Vinyl Chloride	97
1,1-Dichloroethene	100
1,1,1-Trichloroethane	115
cis-1,2-Dichloroethene	96
Trichloroethene	102
Tetrachloroethene	116

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	115	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: CCV

Lab ID#: 2103613-23B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j032603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 09:38 AM**	

Compound	%Recovery
Vinyl Chloride	90
1,1-Dichloroethene	93
1,1,1-Trichloroethane	100
cis-1,2-Dichloroethene	95
Trichloroethene	98
Tetrachloroethene	102

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: LCS

Lab ID#: 2103613-24A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 11:27 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	102	70-130
1,1-Dichloroethene	106	70-130
1,1,1-Trichloroethane	116	70-130
cis-1,2-Dichloroethene	96	70-130
Trichloroethene	102	70-130
Tetrachloroethene	117	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	92	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: LCSD

Lab ID#: 2103613-24AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p032604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 11:55 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	98	70-130
1,1-Dichloroethene	108	70-130
1,1,1-Trichloroethane	117	70-130
cis-1,2-Dichloroethene	99	70-130
Trichloroethene	104	70-130
Tetrachloroethene	115	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	94	70-130
1,2-Dichloroethane-d4	116	70-130
4-Bromofluorobenzene	117	70-130

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Client Sample ID: LCS

Lab ID#: 2103613-24B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j032604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 10:04 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	86	70-130
1,1-Dichloroethene	88	70-130
1,1,1-Trichloroethane	99	70-130
cis-1,2-Dichloroethene	94	70-130
Trichloroethene	96	70-130
Tetrachloroethene	101	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	102	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	98	70-130

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Client Sample ID: LCSD

Lab ID#: 2103613-24BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**j032605**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 3/26/21 10:30 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	86	70-130
1,1-Dichloroethene	88	70-130
1,1,1-Trichloroethane	99	70-130
cis-1,2-Dichloroethene	94	70-130
Trichloroethene	98	70-130
Tetrachloroethene	101	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	103	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	99	70-130

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4/19/2021
Ms. Evelyn Ives
Landau Associates, Inc.
130 2nd Avenue South

Edmonds WA 98020

Project Name: Boeing of Portland
Project #: 25116.120.210
Workorder #: 2104242

Dear Ms. Evelyn Ives

The following report includes the data for the above referenced project for sample(s) received on 4/12/2021 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2104242

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	25116.120.210 Boeing of Portland
DATE RECEIVED:	04/12/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	04/19/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	VOW-16-040821	TO-15	4.7 "Hg	9.4 psi
02A	VOW-17-040821	TO-15	5.3 "Hg	10.1 psi
03A	VOW-18-040821	TO-15	4.7 "Hg	9.9 psi
04A	VP-1-040821	TO-15	4.0 "Hg	10 psi
05A	VP-2-040821	TO-15	5.0 "Hg	10 psi
06A	VP-3-040821	TO-15	4.0 "Hg	10 psi
07A	VP-4-040821	TO-15	3.5 "Hg	10 psi
08A	VP-5-040821	TO-15	4.0 "Hg	10 psi
09A	VP-6-040821	TO-15	4.5 "Hg	10 psi
10A	VP-7-040821	TO-15	5.0 "Hg	10 psi
11A	VP-8-040821	TO-15	4.5 "Hg	10 psi
12A	VP-9-040821	TO-15	4.5 "Hg	10 psi
13A	VP-10-040821	TO-15	5.0 "Hg	10 psi
14A	VP-11-040821	TO-15	5.0 "Hg	10 psi
15A	VP-13-040821	TO-15	4.0 "Hg	10 psi
16A	VP-14-040821	TO-15	3.5 "Hg	10 psi
17A	VP-15-040821	TO-15	4.0 "Hg	10 psi
18A	VP-16-040821	TO-15	5.5 "Hg	10 psi
19A	VP-17-040821	TO-15	4.5 "Hg	10 psi
20A	VP-18-040821	TO-15	4.0 "Hg	11 psi
21A	VP-19-040821	TO-15	4.0 "Hg	10 psi
22A	Lab Blank	TO-15	NA	NA
22B	Lab Blank	TO-15	NA	NA

Continued on next page

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WORK ORDER #: 2104242

Work Order Summary

CLIENT:	Ms. Evelyn Ives Landau Associates, Inc. 130 2nd Avenue South Edmonds, WA 98020	**BILL TO:**	Robert Large Eurofins Lancaster Laboratories Environmental, LLC 2425 New Holland Pike Lancaster, PA 17605-2425
PHONE:	800-552-5957	**P.O. #**	
FAX:	425-778-6409	**PROJECT #**	25116.120.210 Boeing of Portland
DATE RECEIVED:	04/12/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	04/19/2021		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
23A	CCV	TO-15	NA	NA
23B	CCV	TO-15	NA	NA
24A	LCS	TO-15	NA	NA
24AA	LCSD	TO-15	NA	NA
24B	LCS	TO-15	NA	NA
24BB	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 04/19/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
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LABORATORY NARRATIVE
EPA Method TO-15
Landau Associates, Inc.
Workorder# 2104242

Twenty-one 1 Liter Summa Canister samples were received on April 12, 2021. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

Dilution was performed on samples VP-1-040821, VP-5-040821, VP-6-040821, VP-7-040821, VP-8-040821 and VP-13-040821 due to the presence of high level target species.

Dilution was performed on sample VOW-16-040821 due to the presence of high level target species.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VOW-16-040821

Lab ID#: 2104242-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	9.7	15	25	40
Trichloroethene	9.7	35	52	190

Client Sample ID: VOW-17-040821

Lab ID#: 2104242-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	13	2.6	33
1,1,1-Trichloroethane	1.0	1.1	5.6	6.2
cis-1,2-Dichloroethene	1.0	5.4	4.1	21
Trichloroethene	1.0	80	5.5	430
Tetrachloroethene	1.0	7.0	7.0	47

Client Sample ID: VOW-18-040821

Lab ID#: 2104242-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.99	7.0	5.4	38
cis-1,2-Dichloroethene	0.99	1.0	3.9	4.0
Trichloroethene	0.99	14	5.3	76
Tetrachloroethene	0.99	12	6.7	78

Client Sample ID: VP-1-040821

Lab ID#: 2104242-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	3.2	540	17	2900
Tetrachloroethene	3.2	12	22	84

Client Sample ID: VP-2-040821

Lab ID#: 2104242-05A

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-2-040821

Lab ID#: 2104242-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	2.7	5.5	15
Trichloroethene	1.0	23	5.4	120
Tetrachloroethene	1.0	22	6.8	150

Client Sample ID: VP-3-040821

Lab ID#: 2104242-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.97	64	5.3	350
Trichloroethene	0.97	9.9	5.2	53
Tetrachloroethene	0.97	9.1	6.6	62

Client Sample ID: VP-4-040821

Lab ID#: 2104242-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.95	1.6	5.2	8.6
Trichloroethene	0.95	16	5.1	85
Tetrachloroethene	0.95	9.1	6.4	62

Client Sample ID: VP-5-040821

Lab ID#: 2104242-08A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	6.4	21	35	110
Trichloroethene	6.4	1000	35	5500
Tetrachloroethene	6.4	35	44	240

Client Sample ID: VP-6-040821

Lab ID#: 2104242-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-6-040821

Lab ID#: 2104242-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	13	30	52	120
1,1,1-Trichloroethane	13	1900	72	10000
Trichloroethene	13	520	71	2800
Tetrachloroethene	13	26	90	180

Client Sample ID: VP-7-040821

Lab ID#: 2104242-10A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	1.1	3.0	4.4	12
1,1,1-Trichloroethane	1.1	220	6.1	1200
cis-1,2-Dichloroethene	1.1	3.7	4.4	15
Trichloroethene	1.1	17	6.0	90
Tetrachloroethene	1.1	8.8	7.6	60

Client Sample ID: VP-8-040821

Lab ID#: 2104242-11A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	6.6	7.0	26	28
1,1,1-Trichloroethane	6.6	870	36	4700
cis-1,2-Dichloroethene	6.6	12	26	47
Trichloroethene	6.6	41	35	220
Tetrachloroethene	6.6	20	45	130

Client Sample ID: VP-9-040821

Lab ID#: 2104242-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.99	2.6	5.4	14
Trichloroethene	0.99	7.2	5.3	39
Tetrachloroethene	0.99	10	6.7	68

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-10-040821

Lab ID#: 2104242-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	5.1	5.5	28
Trichloroethene	1.0	88	5.4	480
Tetrachloroethene	1.0	18	6.8	120

Client Sample ID: VP-11-040821

Lab ID#: 2104242-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	1.0	22	5.5	120
Trichloroethene	1.0	12	5.4	63
Tetrachloroethene	1.0	17	6.8	120

Client Sample ID: VP-13-040821

Lab ID#: 2104242-15A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	9.7	21	53	120
Trichloroethene	9.7	1500	52	7900
Tetrachloroethene	9.7	45	66	300

Client Sample ID: VP-14-040821

Lab ID#: 2104242-16A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.95	72	5.2	390
Trichloroethene	0.95	63	5.1	340
Tetrachloroethene	0.95	26	6.4	170

Client Sample ID: VP-15-040821

Lab ID#: 2104242-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-15-040821

Lab ID#: 2104242-17A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.97	40	5.3	220
Trichloroethene	0.97	3.2	5.2	17
Tetrachloroethene	0.97	11	6.6	74

Client Sample ID: VP-16-040821

Lab ID#: 2104242-18A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	2.2	2.6	5.5
Trichloroethene	1.0	58	5.5	310
Tetrachloroethene	1.0	11	7.0	76

Client Sample ID: VP-17-040821

Lab ID#: 2104242-19A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	1.9	2.5	4.9
1,1,1-Trichloroethane	0.99	2.6	5.4	14
Trichloroethene	0.99	13	5.3	70
Tetrachloroethene	0.99	16	6.7	100

Client Sample ID: VP-18-040821

Lab ID#: 2104242-20A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Tetrachloroethene	1.0	8.8	6.8	60

Client Sample ID: VP-19-040821

Lab ID#: 2104242-21A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1,1-Trichloroethane	0.97	2.0	5.3	11

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Summary of Detected Compounds
EPA METHOD TO-15 GC/MS FULL SCAN

Client Sample ID: VP-19-040821

Lab ID#: 2104242-21A

Tetrachloroethene	0.97	14	6.6	95

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Client Sample ID: VOW-16-040821

Lab ID#: 2104242-01A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041513**	**Date of Collection: 4/8/21 12:36:00 PM**	
Dil. Factor:	**19.4**	**Date of Analysis: 4/15/21 05:34 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	9.7	15	25	40
1,1-Dichloroethene	9.7	Not Detected	38	Not Detected
1,1,1-Trichloroethane	9.7	Not Detected	53	Not Detected
cis-1,2-Dichloroethene	9.7	Not Detected	38	Not Detected
Trichloroethene	9.7	35	52	190
Tetrachloroethene	9.7	Not Detected	66	Not Detected

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: VOW-17-040821

Lab ID#: 2104242-02A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041514**	**Date of Collection: 4/8/21 12:30:00 PM**	
Dil. Factor:	**2.05**	**Date of Analysis: 4/15/21 06:03 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	13	2.6	33
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	1.1	5.6	6.2
cis-1,2-Dichloroethene	1.0	5.4	4.1	21
Trichloroethene	1.0	80	5.5	430
Tetrachloroethene	1.0	7.0	7.0	47

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	109	70-130

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Client Sample ID: VOW-18-040821

Lab ID#: 2104242-03A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041515**	**Date of Collection: 4/8/21 1:05:00 PM**	
Dil. Factor:	**1.98**	**Date of Analysis: 4/15/21 06:32 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.99	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.99	7.0	5.4	38
cis-1,2-Dichloroethene	0.99	1.0	3.9	4.0
Trichloroethene	0.99	14	5.3	76
Tetrachloroethene	0.99	12	6.7	78

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	108	70-130

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Client Sample ID: VP-1-040821

Lab ID#: 2104242-04A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041516**	**Date of Collection: 4/8/21 12:55:00 PM**	
Dil. Factor:	**6.46**	**Date of Analysis: 4/15/21 07:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	3.2	Not Detected	8.2	Not Detected
1,1-Dichloroethene	3.2	Not Detected	13	Not Detected
1,1,1-Trichloroethane	3.2	Not Detected	18	Not Detected
cis-1,2-Dichloroethene	3.2	Not Detected	13	Not Detected
Trichloroethene	3.2	540	17	2900
Tetrachloroethene	3.2	12	22	84

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: VP-2-040821

Lab ID#: 2104242-05A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041517**	**Date of Collection: 4/8/21 1:30:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 4/15/21 10:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	2.7	5.5	15
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	23	5.4	120
Tetrachloroethene	1.0	22	6.8	150

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: VP-3-040821

Lab ID#: 2104242-06A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041611**	**Date of Collection: 4/8/21 1:34:00 PM**	
Dil. Factor:	**1.94**	**Date of Analysis: 4/16/21 04:23 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.97	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.97	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.97	64	5.3	350
cis-1,2-Dichloroethene	0.97	Not Detected	3.8	Not Detected
Trichloroethene	0.97	9.9	5.2	53
Tetrachloroethene	0.97	9.1	6.6	62

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	111	70-130

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Client Sample ID: VP-4-040821

Lab ID#: 2104242-07A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041612**	**Date of Collection: 4/8/21 1:45:00 PM**	
Dil. Factor:	**1.90**	**Date of Analysis: 4/16/21 04:53 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.95	Not Detected	2.4	Not Detected
1,1-Dichloroethene	0.95	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.95	1.6	5.2	8.6
cis-1,2-Dichloroethene	0.95	Not Detected	3.8	Not Detected
Trichloroethene	0.95	16	5.1	85
Tetrachloroethene	0.95	9.1	6.4	62

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: VP-5-040821

Lab ID#: 2104242-08A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041613**	**Date of Collection: 4/8/21 1:47:00 PM**	
Dil. Factor:	**12.9**	**Date of Analysis: 4/16/21 05:20 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	6.4	Not Detected	16	Not Detected
1,1-Dichloroethene	6.4	Not Detected	26	Not Detected
1,1,1-Trichloroethane	6.4	21	35	110
cis-1,2-Dichloroethene	6.4	Not Detected	26	Not Detected
Trichloroethene	6.4	1000	35	5500
Tetrachloroethene	6.4	35	44	240

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	108	70-130

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Client Sample ID: VP-6-040821

Lab ID#: 2104242-09A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041617**	**Date of Collection: 4/8/21 2:01:00 PM**	
Dil. Factor:	**26.4**	**Date of Analysis: 4/16/21 07:14 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	13	Not Detected	34	Not Detected
1,1-Dichloroethene	13	30	52	120
1,1,1-Trichloroethane	13	1900	72	10000
cis-1,2-Dichloroethene	13	Not Detected	52	Not Detected
Trichloroethene	13	520	71	2800
Tetrachloroethene	13	26	90	180

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	106	70-130

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Client Sample ID: VP-7-040821

Lab ID#: 2104242-10A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041614**	**Date of Collection: 4/8/21 2:39:00 PM**	
Dil. Factor:	**2.24**	**Date of Analysis: 4/16/21 05:51 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.1	Not Detected	2.9	Not Detected
1,1-Dichloroethene	1.1	3.0	4.4	12
1,1,1-Trichloroethane	1.1	220	6.1	1200
cis-1,2-Dichloroethene	1.1	3.7	4.4	15
Trichloroethene	1.1	17	6.0	90
Tetrachloroethene	1.1	8.8	7.6	60

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	101	70-130
4-Bromofluorobenzene	110	70-130

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Client Sample ID: VP-8-040821

Lab ID#: 2104242-11A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041615**	**Date of Collection: 4/8/21 2:42:00 PM**	
Dil. Factor:	**13.2**	**Date of Analysis: 4/16/21 06:18 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	6.6	Not Detected	17	Not Detected
1,1-Dichloroethene	6.6	7.0	26	28
1,1,1-Trichloroethane	6.6	870	36	4700
cis-1,2-Dichloroethene	6.6	12	26	47
Trichloroethene	6.6	41	35	220
Tetrachloroethene	6.6	20	45	130

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	107	70-130

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Client Sample ID: VP-9-040821

Lab ID#: 2104242-12A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041618**	**Date of Collection: 4/8/21 2:52:00 PM**	
Dil. Factor:	**1.98**	**Date of Analysis: 4/16/21 09:30 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.99	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.99	2.6	5.4	14
cis-1,2-Dichloroethene	0.99	Not Detected	3.9	Not Detected
Trichloroethene	0.99	7.2	5.3	39
Tetrachloroethene	0.99	10	6.7	68

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	100	70-130
4-Bromofluorobenzene	105	70-130

eurofins | Air Toxics

Client Sample ID: VP-10-040821

Lab ID#: 2104242-13A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041619**	**Date of Collection: 4/8/21 3:21:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 4/16/21 10:00 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	5.1	5.5	28
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	88	5.4	480
Tetrachloroethene	1.0	18	6.8	120

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	110	70-130

eurofins | Air Toxics

Client Sample ID: VP-11-040821

Lab ID#: 2104242-14A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041620**	**Date of Collection: 4/8/21 3:37:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 4/16/21 10:29 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	22	5.5	120
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	12	5.4	63
Tetrachloroethene	1.0	17	6.8	120

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	99	70-130
4-Bromofluorobenzene	109	70-130

eurofins | Air Toxics

Client Sample ID: VP-13-040821

Lab ID#: 2104242-15A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041616**	**Date of Collection: 4/8/21 3:39:00 PM**	
Dil. Factor:	**19.4**	**Date of Analysis: 4/16/21 06:46 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	9.7	Not Detected	25	Not Detected
1,1-Dichloroethene	9.7	Not Detected	38	Not Detected
1,1,1-Trichloroethane	9.7	21	53	120
cis-1,2-Dichloroethene	9.7	Not Detected	38	Not Detected
Trichloroethene	9.7	1500	52	7900
Tetrachloroethene	9.7	45	66	300

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	107	70-130

eurofins | Air Toxics

Client Sample ID: VP-14-040821

Lab ID#: 2104242-16A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041621**	**Date of Collection: 4/8/21 3:42:00 PM**	
Dil. Factor:	**1.90**	**Date of Analysis: 4/16/21 10:58 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.95	Not Detected	2.4	Not Detected
1,1-Dichloroethene	0.95	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.95	72	5.2	390
cis-1,2-Dichloroethene	0.95	Not Detected	3.8	Not Detected
Trichloroethene	0.95	63	5.1	340
Tetrachloroethene	0.95	26	6.4	170

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	110	70-130

eurofins | Air Toxics

Client Sample ID: VP-15-040821

Lab ID#: 2104242-17A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041622**	**Date of Collection: 4/8/21 4:29:00 PM**	
Dil. Factor:	**1.94**	**Date of Analysis: 4/16/21 11:28 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.97	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.97	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.97	40	5.3	220
cis-1,2-Dichloroethene	0.97	Not Detected	3.8	Not Detected
Trichloroethene	0.97	3.2	5.2	17
Tetrachloroethene	0.97	11	6.6	74

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	110	70-130

eurofins | Air Toxics

Client Sample ID: VP-16-040821

Lab ID#: 2104242-18A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041623**	**Date of Collection: 4/8/21 4:32:00 PM**	
Dil. Factor:	**2.06**	**Date of Analysis: 4/16/21 11:57 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	2.2	2.6	5.5
1,1-Dichloroethene	1.0	Not Detected	4.1	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.6	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.1	Not Detected
Trichloroethene	1.0	58	5.5	310
Tetrachloroethene	1.0	11	7.0	76

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	108	70-130

eurofins | Air Toxics

Client Sample ID: VP-17-040821

Lab ID#: 2104242-19A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041624**	**Date of Collection: 4/8/21 4:34:00 PM**	
Dil. Factor:	**1.98**	**Date of Analysis: 4/17/21 12:26 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.99	1.9	2.5	4.9
1,1-Dichloroethene	0.99	Not Detected	3.9	Not Detected
1,1,1-Trichloroethane	0.99	2.6	5.4	14
cis-1,2-Dichloroethene	0.99	Not Detected	3.9	Not Detected
Trichloroethene	0.99	13	5.3	70
Tetrachloroethene	0.99	16	6.7	100

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	108	70-130

eurofins | Air Toxics

Client Sample ID: VP-18-040821

Lab ID#: 2104242-20A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041625**	**Date of Collection: 4/8/21 4:52:00 PM**	
Dil. Factor:	**2.02**	**Date of Analysis: 4/17/21 12:56 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	1.0	Not Detected	2.6	Not Detected
1,1-Dichloroethene	1.0	Not Detected	4.0	Not Detected
1,1,1-Trichloroethane	1.0	Not Detected	5.5	Not Detected
cis-1,2-Dichloroethene	1.0	Not Detected	4.0	Not Detected
Trichloroethene	1.0	Not Detected	5.4	Not Detected
Tetrachloroethene	1.0	8.8	6.8	60

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	109	70-130

eurofins | Air Toxics

Client Sample ID: VP-19-040821

Lab ID#: 2104242-21A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041626**	**Date of Collection: 4/8/21 4:48:00 PM**	
Dil. Factor:	**1.94**	**Date of Analysis: 4/17/21 01:25 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.97	Not Detected	2.5	Not Detected
1,1-Dichloroethene	0.97	Not Detected	3.8	Not Detected
1,1,1-Trichloroethane	0.97	2.0	5.3	11
cis-1,2-Dichloroethene	0.97	Not Detected	3.8	Not Detected
Trichloroethene	0.97	Not Detected	5.2	Not Detected
Tetrachloroethene	0.97	14	6.6	95

Container Type: 1 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	105	70-130
4-Bromofluorobenzene	110	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2104242-22A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041505c**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/15/21 12:28 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	108	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 2104242-22B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041607e**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/16/21 01:46 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Vinyl Chloride	0.50	Not Detected	1.3	Not Detected
1,1-Dichloroethene	0.50	Not Detected	2.0	Not Detected
1,1,1-Trichloroethane	0.50	Not Detected	2.7	Not Detected
cis-1,2-Dichloroethene	0.50	Not Detected	2.0	Not Detected
Trichloroethene	0.50	Not Detected	2.7	Not Detected
Tetrachloroethene	0.50	Not Detected	3.4	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	100	70-130
1,2-Dichloroethane-d4	103	70-130
4-Bromofluorobenzene	107	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 2104242-23A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041502**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/15/21 10:42 AM**	

Compound	%Recovery
Vinyl Chloride	105
1,1-Dichloroethene	101
1,1,1-Trichloroethane	102
cis-1,2-Dichloroethene	99
Trichloroethene	105
Tetrachloroethene	113

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	97	70-130
1,2-Dichloroethane-d4	107	70-130
4-Bromofluorobenzene	112	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 2104242-23B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041602**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/16/21 10:43 AM**	

Compound	%Recovery
Vinyl Chloride	110
1,1-Dichloroethene	102
1,1,1-Trichloroethane	107
cis-1,2-Dichloroethene	104
Trichloroethene	106
Tetrachloroethene	116

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130
1,2-Dichloroethane-d4	104	70-130
4-Bromofluorobenzene	113	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2104242-24A

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041503**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/15/21 11:11 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	106	70-130
1,1-Dichloroethene	109	70-130
1,1,1-Trichloroethane	111	70-130
cis-1,2-Dichloroethene	105	70-130
Trichloroethene	107	70-130
Tetrachloroethene	114	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	99	70-130
1,2-Dichloroethane-d4	109	70-130
4-Bromofluorobenzene	112	70-130

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Client Sample ID: LCSD

Lab ID#: 2104242-24AA

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041504**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/15/21 11:39 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	105	70-130
1,1-Dichloroethene	106	70-130
1,1,1-Trichloroethane	105	70-130
cis-1,2-Dichloroethene	102	70-130
Trichloroethene	106	70-130
Tetrachloroethene	113	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	106	70-130
4-Bromofluorobenzene	111	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 2104242-24B

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041603**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/16/21 11:12 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	111	70-130
1,1-Dichloroethene	111	70-130
1,1,1-Trichloroethane	110	70-130
cis-1,2-Dichloroethene	106	70-130
Trichloroethene	107	70-130
Tetrachloroethene	117	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	114	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 2104242-24BB

EPA METHOD TO-15 GC/MS FULL SCAN

File Name:	**p041604**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/16/21 11:41 AM**	

Compound	%Recovery	Method Limits
Vinyl Chloride	109	70-130
1,1-Dichloroethene	114	70-130
1,1,1-Trichloroethane	112	70-130
cis-1,2-Dichloroethene	106	70-130
Trichloroethene	108	70-130
Tetrachloroethene	116	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	98	70-130
1,2-Dichloroethane-d4	110	70-130
4-Bromofluorobenzene	112	70-130

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Thursday, January 14, 2021

Evelyn Ives
Landau Associates
1500 SW First Avenue Suite 1015
Portland, OR 97201

RE: A0L1061 - Boeing Portland - 025116.120.210

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A0L1061, which was received by the laboratory on 12/31/2020 at 3:40:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of sample reciept, unless prior arrangements have been made.

Cooler Receipt Information

(See Cooler Receipt Form for details)

Cooler #1	2.6 degC

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.
All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
B-1(0.5-1.0)122920	A0L1061-01	Soil	12/29/20 15:40	12/31/20 15:40
B-1(2.0-3.0)122920	A0L1061-02	Soil	12/29/20 16:00	12/31/20 15:40
B-1(4.0-4.3)123020	A0L1061-03	Soil	12/30/20 11:22	12/31/20 15:40
B-2(2.0-3.0)123020	A0L1061-04	Soil	12/30/20 13:58	12/31/20 15:40
B-2(4.0-4.6)123020	A0L1061-05	Soil	12/30/20 15:45	12/31/20 15:40
B-3(2.5-3.0)123020	A0L1061-06	Soil	12/30/20 16:40	12/31/20 15:40
B-3(4.0-4.2)123020	A0L1061-07	Soil	12/30/20 17:45	12/31/20 15:40
B-4(0.5-1.0)122820	A0L1061-08	Soil	12/28/20 14:50	12/31/20 15:40
B-4(2.0-3.0)122820	A0L1061-09	Soil	12/28/20 16:30	12/31/20 15:40
B-5(0.5-1.0)122920	A0L1061-10	Soil	12/29/20 09:20	12/31/20 15:40
B-5(2.0-3.0)122920	A0L1061-11	Soil	12/29/20 09:55	12/31/20 15:40
B-5(4.0-5.0)122920	A0L1061-12	Soil	12/29/20 10:10	12/31/20 15:40
B-6(0.5-1.0)123120	A0L1061-13	Soil	12/31/20 08:40	12/31/20 15:40
B-6(2.0-3.0)123120	A0L1061-14	Soil	12/31/20 09:38	12/31/20 15:40
B-6(4.0-5.0)123120	A0L1061-15	Soil	12/31/20 09:55	12/31/20 15:40

Apex Laboratories

Lisa Domenighini, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1(0.5-1.0)122920 (A0L1061-01)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	22.8	ug/kg dry	50	01/05/21 14:45	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	22.8	ug/kg dry	50	01/05/21 14:45	5035A/8260D	
Trichloroethene (TCE)	ND	---	22.8	ug/kg dry	50	01/05/21 14:45	5035A/8260D	
Vinyl chloride	ND	---	22.8	ug/kg dry	50	01/05/21 14:45	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*96 %*	*Limits: 80-120 %*	*1*	*01/05/21 14:45*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/05/21 14:45*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*01/05/21 14:45*	*5035A/8260D*	
B-1(2.0-3.0)122920 (A0L1061-02)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	29.6	ug/kg dry	50	01/05/21 15:39	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	29.6	ug/kg dry	50	01/05/21 15:39	5035A/8260D	
Trichloroethene (TCE)	ND	---	29.6	ug/kg dry	50	01/05/21 15:39	5035A/8260D	
Vinyl chloride	ND	---	29.6	ug/kg dry	50	01/05/21 15:39	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*95 %*	*Limits: 80-120 %*	*1*	*01/05/21 15:39*	*5035A/8260D*	
Toluene-d8 (Surr)			*102 %*	*80-120 %*	*1*	*01/05/21 15:39*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*01/05/21 15:39*	*5035A/8260D*	
B-1(4.0-4.3)123020 (A0L1061-03)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	21.7	ug/kg dry	50	01/05/21 16:06	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	21.7	ug/kg dry	50	01/05/21 16:06	5035A/8260D	
Trichloroethene (TCE)	ND	---	21.7	ug/kg dry	50	01/05/21 16:06	5035A/8260D	
Vinyl chloride	ND	---	21.7	ug/kg dry	50	01/05/21 16:06	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*93 %*	*Limits: 80-120 %*	*1*	*01/05/21 16:06*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/05/21 16:06*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*01/05/21 16:06*	*5035A/8260D*	
B-2(2.0-3.0)123020 (A0L1061-04)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	23.5	ug/kg dry	50	01/05/21 16:34	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	23.5	ug/kg dry	50	01/05/21 16:34	5035A/8260D	
Trichloroethene (TCE)	ND	---	23.5	ug/kg dry	50	01/05/21 16:34	5035A/8260D	
Vinyl chloride	ND	---	23.5	ug/kg dry	50	01/05/21 16:34	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*93 %*	*Limits: 80-120 %*	*1*	*01/05/21 16:34*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/05/21 16:34*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*01/05/21 16:34*	*5035A/8260D*	
B-2(4.0-4.6)123020 (A0L1061-05)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	24.4	ug/kg dry	50	01/05/21 17:01	5035A/8260D	

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503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-2(4.0-4.6)123020 (A0L1061-05)				**Matrix: Soil**		**Batch: 1012500**		
Tetrachloroethene (PCE)	ND	---	24.4	ug/kg dry	50	01/05/21 17:01	5035A/8260D	
Trichloroethene (TCE)	ND	---	24.4	ug/kg dry	50	01/05/21 17:01	5035A/8260D	
Vinyl chloride	ND	---	24.4	ug/kg dry	50	01/05/21 17:01	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*91 %*	*Limits: 80-120 %*	*1*	*01/05/21 17:01*	*5035A/8260D*	
Toluene-d8 (Surr)			*103 %*	*80-120 %*	*1*	*01/05/21 17:01*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*99 %*	*79-120 %*	*1*	*01/05/21 17:01*	*5035A/8260D*	
B-3(4.0-4.2)123020 (A0L1061-07)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	24.4	ug/kg dry	50	01/05/21 17:28	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	24.4	ug/kg dry	50	01/05/21 17:28	5035A/8260D	
Trichloroethene (TCE)	ND	---	24.4	ug/kg dry	50	01/05/21 17:28	5035A/8260D	
Vinyl chloride	ND	---	24.4	ug/kg dry	50	01/05/21 17:28	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*90 %*	*Limits: 80-120 %*	*1*	*01/05/21 17:28*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/05/21 17:28*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*	*1*	*01/05/21 17:28*	*5035A/8260D*	
B-4(0.5-1.0)122820 (A0L1061-08)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	36.3	ug/kg dry	50	01/05/21 17:56	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	36.3	ug/kg dry	50	01/05/21 17:56	5035A/8260D	
Trichloroethene (TCE)	ND	---	36.3	ug/kg dry	50	01/05/21 17:56	5035A/8260D	
Vinyl chloride	ND	---	36.3	ug/kg dry	50	01/05/21 17:56	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*91 %*	*Limits: 80-120 %*	*1*	*01/05/21 17:56*	*5035A/8260D*	
Toluene-d8 (Surr)			*102 %*	*80-120 %*	*1*	*01/05/21 17:56*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*	*1*	*01/05/21 17:56*	*5035A/8260D*	
B-4(2.0-3.0)122820 (A0L1061-09)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	25.1	ug/kg dry	50	01/05/21 18:23	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	25.1	ug/kg dry	50	01/05/21 18:23	5035A/8260D	
Trichloroethene (TCE)	ND	---	25.1	ug/kg dry	50	01/05/21 18:23	5035A/8260D	
Vinyl chloride	ND	---	25.1	ug/kg dry	50	01/05/21 18:23	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*90 %*	*Limits: 80-120 %*	*1*	*01/05/21 18:23*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/05/21 18:23*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*97 %*	*79-120 %*	*1*	*01/05/21 18:23*	*5035A/8260D*	
B-5(0.5-1.0)122920 (A0L1061-10)				**Matrix: Soil**		**Batch: 1012500**		
cis-1,2-Dichloroethene	ND	---	24.1	ug/kg dry	50	01/05/21 18:50	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	24.1	ug/kg dry	50	01/05/21 18:50	5035A/8260D	

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ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-5(0.5-1.0)122920 (A0L1061-10)				**Matrix: Soil**		**Batch: 1012500**		
Trichloroethene (TCE)	ND	---	24.1	ug/kg dry	50	01/05/21 18:50	5035A/8260D	
Vinyl chloride	ND	---	24.1	ug/kg dry	50	01/05/21 18:50	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 89 %*		*Limits: 80-120 %*	*1*	*01/05/21 18:50*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/05/21 18:50*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*99 %*	*79-120 %*	*1*	*01/05/21 18:50*	*5035A/8260D*	
B-5(2.0-3.0)122920 (A0L1061-11RE1)				**Matrix: Soil**		**Batch: 1012671**		
cis-1,2-Dichloroethene	ND	---	31.9	ug/kg dry	50	01/08/21 13:55	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	31.9	ug/kg dry	50	01/08/21 13:55	5035A/8260D	
Trichloroethene (TCE)	ND	---	31.9	ug/kg dry	50	01/08/21 13:55	5035A/8260D	
Vinyl chloride	ND	---	31.9	ug/kg dry	50	01/08/21 13:55	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 87 %*		*Limits: 80-120 %*	*1*	*01/08/21 13:55*	*5035A/8260D*	
Toluene-d8 (Surr)			*103 %*	*80-120 %*	*1*	*01/08/21 13:55*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*99 %*	*79-120 %*	*1*	*01/08/21 13:55*	*5035A/8260D*	
B-5(4.0-5.0)122920 (A0L1061-12)				**Matrix: Soil**		**Batch: 1012618**		
cis-1,2-Dichloroethene	ND	---	29.7	ug/kg dry	50	01/07/21 19:08	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	29.7	ug/kg dry	50	01/07/21 19:08	5035A/8260D	
Trichloroethene (TCE)	ND	---	29.7	ug/kg dry	50	01/07/21 19:08	5035A/8260D	
Vinyl chloride	ND	---	29.7	ug/kg dry	50	01/07/21 19:08	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 111 %*		*Limits: 80-120 %*	*1*	*01/07/21 19:08*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/07/21 19:08*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*98 %*	*79-120 %*	*1*	*01/07/21 19:08*	*5035A/8260D*	
B-6(0.5-1.0)123120 (A0L1061-13)				**Matrix: Soil**		**Batch: 1012618**		
cis-1,2-Dichloroethene	ND	---	25.2	ug/kg dry	50	01/07/21 19:35	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	25.2	ug/kg dry	50	01/07/21 19:35	5035A/8260D	
Trichloroethene (TCE)	ND	---	25.2	ug/kg dry	50	01/07/21 19:35	5035A/8260D	
Vinyl chloride	ND	---	25.2	ug/kg dry	50	01/07/21 19:35	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery: 108 %*		*Limits: 80-120 %*	*1*	*01/07/21 19:35*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/07/21 19:35*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*01/07/21 19:35*	*5035A/8260D*	
B-6(2.0-3.0)123120 (A0L1061-14)				**Matrix: Soil**		**Batch: 1012618**		
cis-1,2-Dichloroethene	ND	---	29.3	ug/kg dry	50	01/07/21 20:03	5035A/8260D	
Tetrachloroethene (PCE)	**46.9**	---	29.3	ug/kg dry	50	01/07/21 20:03	5035A/8260D	
Trichloroethene (TCE)	**64.5**	---	29.3	ug/kg dry	50	01/07/21 20:03	5035A/8260D	

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ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-6(2.0-3.0)123120 (A0L1061-14)				**Matrix: Soil**		**Batch: 1012618**		
Vinyl chloride	ND	---	29.3	ug/kg dry	50	01/07/21 20:03	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*105 %*	*Limits: 80-120 %*	*1*	*01/07/21 20:03*	*5035A/8260D*	
Toluene-d8 (Surr)			*102 %*	*80-120 %*	*1*	*01/07/21 20:03*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*	*1*	*01/07/21 20:03*	*5035A/8260D*	
B-6(4.0-5.0)123120 (A0L1061-15)				**Matrix: Soil**		**Batch: 1012618**		
cis-1,2-Dichloroethene	ND	---	27.9	ug/kg dry	50	01/07/21 20:30	5035A/8260D	
Tetrachloroethene (PCE)	ND	---	27.9	ug/kg dry	50	01/07/21 20:30	5035A/8260D	
Trichloroethene (TCE)	ND	---	27.9	ug/kg dry	50	01/07/21 20:30	5035A/8260D	
Vinyl chloride	ND	---	27.9	ug/kg dry	50	01/07/21 20:30	5035A/8260D	
Surrogate: 1,4-Difluorobenzene (Surr)		*Recovery:*	*102 %*	*Limits: 80-120 %*	*1*	*01/07/21 20:30*	*5035A/8260D*	
Toluene-d8 (Surr)			*101 %*	*80-120 %*	*1*	*01/07/21 20:30*	*5035A/8260D*	
4-Bromofluorobenzene (Surr)			*99 %*	*79-120 %*	*1*	*01/07/21 20:30*	*5035A/8260D*	

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Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-1(0.5-1.0)122920 (A0L1061-01)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**92.8**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-1(2.0-3.0)122920 (A0L1061-02)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**89.8**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-1(4.0-4.3)123020 (A0L1061-03)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**92.0**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-2(2.0-3.0)123020 (A0L1061-04)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**95.7**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-2(4.0-4.6)123020 (A0L1061-05)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**94.5**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-3(4.0-4.2)123020 (A0L1061-07)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**93.1**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-4(0.5-1.0)122820 (A0L1061-08)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**88.5**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-4(2.0-3.0)122820 (A0L1061-09)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**90.5**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-5(0.5-1.0)122920 (A0L1061-10)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**90.4**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-5(2.0-3.0)122920 (A0L1061-11)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**90.1**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-5(4.0-5.0)122920 (A0L1061-12)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**91.7**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-6(0.5-1.0)123120 (A0L1061-13)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**91.8**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-6(2.0-3.0)123120 (A0L1061-14)				**Matrix: Soil**		**Batch: 1012447**		

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Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
B-6(2.0-3.0)123120 (A0L1061-14)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**91.6**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	
B-6(4.0-5.0)123120 (A0L1061-15)				**Matrix: Soil**		**Batch: 1012447**		
% Solids	**92.3**	---	1.00	%	1	01/05/21 07:29	EPA 8000D	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012500 - EPA 5035A							**Soil**					
Blank (1012500-BLK1)		Prepared: 01/05/21 09:00		Analyzed: 01/05/21 13:23								
5035A/8260D												
cis-1,2-Dichloroethene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Vinyl chloride	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 100 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*101 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*101 %*		*79-120 %*			*"*					
LCS (1012500-BS1)		Prepared: 01/05/21 09:00		Analyzed: 01/05/21 12:29								
5035A/8260D												
cis-1,2-Dichloroethene	1000	---	25.0	ug/kg wet	50	1000	---	100	80 - 120%	---	---	
Tetrachloroethene (PCE)	1040	---	25.0	ug/kg wet	50	1000	---	104	80 - 120%	---	---	
Trichloroethene (TCE)	1090	---	25.0	ug/kg wet	50	1000	---	109	80 - 120%	---	---	
Vinyl chloride	1070	---	25.0	ug/kg wet	50	1000	---	107	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 104 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*101 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*100 %*		*79-120 %*			*"*					
Duplicate (1012500-DUP1)		Prepared: 12/29/20 15:40		Analyzed: 01/05/21 15:12								
QC Source Sample: B-1(0.5-1.0)122920 (A0L1061-01)												
5035A/8260D												
cis-1,2-Dichloroethene	ND	---	24.3	ug/kg dry	50	---	ND	---	---	---	30%	
Tetrachloroethene (PCE)	ND	---	24.3	ug/kg dry	50	---	ND	---	---	---	30%	
Trichloroethene (TCE)	ND	---	24.3	ug/kg dry	50	---	ND	---	---	---	30%	
Vinyl chloride	ND	---	24.3	ug/kg dry	50	---	ND	---	---	---	30%	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 95 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*102 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*99 %*		*79-120 %*			*"*					
Matrix Spike (1012500-MS1)		Prepared: 12/29/20 09:20		Analyzed: 01/05/21 19:17								
QC Source Sample: B-5(0.5-1.0)122920 (A0L1061-10)												
5035A/8260D												

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012500 - EPA 5035A							**Soil**					
Matrix Spike (1012500-MS1)		Prepared: 12/29/20 09:20		Analyzed: 01/05/21 19:17								
QC Source Sample: B-5(0.5-1.0)122920 (A0L1061-10)												
cis-1,2-Dichloroethene	873	---	24.1	ug/kg dry	50	964	ND	91	77 - 123%	---	---	
Tetrachloroethene (PCE)	974	---	24.1	ug/kg dry	50	964	ND	101	73 - 128%	---	---	
Trichloroethene (TCE)	855	---	24.1	ug/kg dry	50	964	ND	89	77 - 123%	---	---	
Vinyl chloride	993	---	24.1	ug/kg dry	50	964	ND	103	56 - 135%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery:*	*88 %*	*Limits:*	*80-120 %*		*Dilution:*	*1x*				
Toluene-d8 (Surr)			*101 %*		*80-120 %*			*"*				
4-Bromofluorobenzene (Surr)			*95 %*		*79-120 %*			*"*				

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Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012618 - EPA 5035A							**Soil**					
Blank (1012618-BLK1)		Prepared: 01/07/21 09:00 Analyzed: 01/07/21 14:35										
5035A/8260D												
cis-1,2-Dichloroethene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Vinyl chloride	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 86 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*103 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*98 %*		*79-120 %*			*"*					
LCS (1012618-BS1)		Prepared: 01/07/21 09:00 Analyzed: 01/07/21 13:40										
5035A/8260D												
cis-1,2-Dichloroethene	860	---	25.0	ug/kg wet	50	1000	---	86	80 - 120%	---	---	
Tetrachloroethene (PCE)	1010	---	25.0	ug/kg wet	50	1000	---	101	80 - 120%	---	---	
Trichloroethene (TCE)	862	---	25.0	ug/kg wet	50	1000	---	86	80 - 120%	---	---	
Vinyl chloride	930	---	25.0	ug/kg wet	50	1000	---	93	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 87 %*		*Limits: 80-120 %*			*Dilution: 1x*					
Toluene-d8 (Surr)		*102 %*		*80-120 %*			*"*					
4-Bromofluorobenzene (Surr)		*93 %*		*79-120 %*			*"*					

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ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012671 - EPA 5035A							**Soil**					
Blank (1012671-BLK1)		Prepared: 01/08/21 09:00		Analyzed: 01/08/21 13:28								
5035A/8260D												
Acetone	ND	---	667	ug/kg wet	50	---	---	---	---	---	---	
Acrylonitrile	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
Benzene	ND	---	6.67	ug/kg wet	50	---	---	---	---	---	---	
Bromobenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Bromochloromethane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Bromodichloromethane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Bromoform	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
Bromomethane	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
2-Butanone (MEK)	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
n-Butylbenzene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
sec-Butylbenzene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
tert-Butylbenzene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Carbon disulfide	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
Carbon tetrachloride	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Chlorobenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Chloroethane	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
Chloroform	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Chloromethane	ND	---	167	ug/kg wet	50	---	---	---	---	---	---	
2-Chlorotoluene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
4-Chlorotoluene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Dibromochloromethane	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dibromo-3-chloropropane	ND	---	167	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dibromoethane (EDB)	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Dibromomethane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dichlorobenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,3-Dichlorobenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,4-Dichlorobenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Dichlorodifluoromethane	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethane	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,2-Dichloroethane (EDC)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,1-Dichloroethene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
cis-1,2-Dichloroethene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
trans-1,2-Dichloroethene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	

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503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012671 - EPA 5035A							**Soil**					
Blank (1012671-BLK1)		Prepared: 01/08/21 09:00		Analyzed: 01/08/21 13:28								
1,2-Dichloropropane	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,3-Dichloropropane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
2,2-Dichloropropane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
1,1-Dichloropropene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
cis-1,3-Dichloropropene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
trans-1,3-Dichloropropene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Ethylbenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Hexachlorobutadiene	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
2-Hexanone	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
Isopropylbenzene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
4-Isopropyltoluene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Methylene chloride	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
4-Methyl-2-pentanone (MiBK)	ND	---	333	ug/kg wet	50	---	---	---	---	---	---	
Methyl tert-butyl ether (MTBE)	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Naphthalene	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
n-Propylbenzene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Styrene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
1,1,1,2-Tetrachloroethane	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,1,2,2-Tetrachloroethane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Tetrachloroethene (PCE)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Toluene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichlorobenzene	ND	---	167	ug/kg wet	50	---	---	---	---	---	---	
1,2,4-Trichlorobenzene	ND	---	167	ug/kg wet	50	---	---	---	---	---	---	
1,1,1-Trichloroethane	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
1,1,2-Trichloroethane	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Trichloroethene (TCE)	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Trichlorofluoromethane	ND	---	66.7	ug/kg wet	50	---	---	---	---	---	---	
1,2,3-Trichloropropane	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
1,2,4-Trimethylbenzene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
1,3,5-Trimethylbenzene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
Vinyl chloride	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
m,p-Xylene	ND	---	33.3	ug/kg wet	50	---	---	---	---	---	---	
o-Xylene	ND	---	16.7	ug/kg wet	50	---	---	---	---	---	---	
Surr: 1,4-Difluorobenzene (Surr)		*Recovery: 86 %*		*Limits: 80-120 %*				*Dilution: 1x*				

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503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012671 - EPA 5035A									Soil			
Blank (1012671-BLK1)			Prepared: 01/08/21 09:00 Analyzed: 01/08/21 13:28									
Surr: Toluene-d8 (Surr)			*Recovery: 101 %*	*Limits: 80-120 %*				*Dilution: 1x*				
4-Bromofluorobenzene (Surr)			*100 %*	*79-120 %*				*"*				
LCS (1012671-BS2)			Prepared: 01/08/21 09:00 Analyzed: 01/08/21 12:33									
5035A/8260D												
Acetone	1630	---	1000	ug/kg wet	50	2000	---	82	80 - 120%	---	---	
Acrylonitrile	717	---	100	ug/kg wet	50	1000	---	**72**	**80 - 120%**	---	---	Q-55
Benzene	820	---	10.0	ug/kg wet	50	1000	---	82	80 - 120%	---	---	
Bromobenzene	942	---	25.0	ug/kg wet	50	1000	---	94	80 - 120%	---	---	
Bromochloromethane	837	---	50.0	ug/kg wet	50	1000	---	84	80 - 120%	---	---	
Bromodichloromethane	881	---	50.0	ug/kg wet	50	1000	---	88	80 - 120%	---	---	
Bromoform	1070	---	100	ug/kg wet	50	1000	---	107	80 - 120%	---	---	
Bromomethane	1200	---	500	ug/kg wet	50	1000	---	120	80 - 120%	---	---	
2-Butanone (MEK)	1420	---	500	ug/kg wet	50	2000	---	**71**	**80 - 120%**	---	---	Q-55
n-Butylbenzene	1020	---	50.0	ug/kg wet	50	1000	---	102	80 - 120%	---	---	
sec-Butylbenzene	992	---	50.0	ug/kg wet	50	1000	---	99	80 - 120%	---	---	
tert-Butylbenzene	1000	---	50.0	ug/kg wet	50	1000	---	100	80 - 120%	---	---	
Carbon disulfide	872	---	500	ug/kg wet	50	1000	---	87	80 - 120%	---	---	
Carbon tetrachloride	1000	---	50.0	ug/kg wet	50	1000	---	100	80 - 120%	---	---	
Chlorobenzene	974	---	25.0	ug/kg wet	50	1000	---	97	80 - 120%	---	---	
Chloroethane	775	---	500	ug/kg wet	50	1000	---	**78**	**80 - 120%**	---	---	Q-55
Chloroform	890	---	50.0	ug/kg wet	50	1000	---	89	80 - 120%	---	---	
Chloromethane	734	---	250	ug/kg wet	50	1000	---	**73**	**80 - 120%**	---	---	Q-55
2-Chlorotoluene	972	---	50.0	ug/kg wet	50	1000	---	97	80 - 120%	---	---	
4-Chlorotoluene	974	---	50.0	ug/kg wet	50	1000	---	97	80 - 120%	---	---	
Dibromochloromethane	1040	---	100	ug/kg wet	50	1000	---	104	80 - 120%	---	---	
1,2-Dibromo-3-chloropropane	846	---	250	ug/kg wet	50	1000	---	85	80 - 120%	---	---	
1,2-Dibromoethane (EDB)	1040	---	50.0	ug/kg wet	50	1000	---	104	80 - 120%	---	---	
Dibromomethane	898	---	50.0	ug/kg wet	50	1000	---	90	80 - 120%	---	---	
1,2-Dichlorobenzene	943	---	25.0	ug/kg wet	50	1000	---	94	80 - 120%	---	---	
1,3-Dichlorobenzene	969	---	25.0	ug/kg wet	50	1000	---	97	80 - 120%	---	---	
1,4-Dichlorobenzene	954	---	25.0	ug/kg wet	50	1000	---	95	80 - 120%	---	---	
Dichlorodifluoromethane	1150	---	100	ug/kg wet	50	1000	---	115	80 - 120%	---	---	
1,1-Dichloroethane	816	---	25.0	ug/kg wet	50	1000	---	82	80 - 120%	---	---	

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Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012671 - EPA 5035A							**Soil**					
LCS (1012671-BS2)		Prepared: 01/08/21 09:00		Analyzed: 01/08/21 12:33								
1,2-Dichloroethane (EDC)	919	---	25.0	ug/kg wet	50	1000	---	92	80 - 120%	---	---	
1,1-Dichloroethene	944	---	25.0	ug/kg wet	50	1000	---	94	80 - 120%	---	---	
cis-1,2-Dichloroethene	852	---	25.0	ug/kg wet	50	1000	---	85	80 - 120%	---	---	
trans-1,2-Dichloroethene	881	---	25.0	ug/kg wet	50	1000	---	88	80 - 120%	---	---	
1,2-Dichloropropane	791	---	25.0	ug/kg wet	50	1000	---	**79**	**80 - 120%**	---	---	Q-55
1,3-Dichloropropane	978	---	50.0	ug/kg wet	50	1000	---	98	80 - 120%	---	---	
2,2-Dichloropropane	1080	---	50.0	ug/kg wet	50	1000	---	108	80 - 120%	---	---	
1,1-Dichloropropene	874	---	50.0	ug/kg wet	50	1000	---	87	80 - 120%	---	---	
cis-1,3-Dichloropropene	1020	---	50.0	ug/kg wet	50	1000	---	102	80 - 120%	---	---	
trans-1,3-Dichloropropene	1090	---	50.0	ug/kg wet	50	1000	---	109	80 - 120%	---	---	
Ethylbenzene	972	---	25.0	ug/kg wet	50	1000	---	97	80 - 120%	---	---	
Hexachlorobutadiene	1090	---	100	ug/kg wet	50	1000	---	109	80 - 120%	---	---	
2-Hexanone	1670	---	500	ug/kg wet	50	2000	---	84	80 - 120%	---	---	
Isopropylbenzene	1000	---	50.0	ug/kg wet	50	1000	---	100	80 - 120%	---	---	
4-Isopropyltoluene	982	---	50.0	ug/kg wet	50	1000	---	98	80 - 120%	---	---	
Methylene chloride	874	---	500	ug/kg wet	50	1000	---	87	80 - 120%	---	---	
4-Methyl-2-pentanone (MiBK)	1640	---	500	ug/kg wet	50	2000	---	82	80 - 120%	---	---	
Methyl tert-butyl ether (MTBE)	876	---	50.0	ug/kg wet	50	1000	---	88	80 - 120%	---	---	
Naphthalene	928	---	100	ug/kg wet	50	1000	---	93	80 - 120%	---	---	
n-Propylbenzene	970	---	25.0	ug/kg wet	50	1000	---	97	80 - 120%	---	---	
Styrene	928	---	50.0	ug/kg wet	50	1000	---	93	80 - 120%	---	---	
1,1,1,2-Tetrachloroethane	1090	---	25.0	ug/kg wet	50	1000	---	109	80 - 120%	---	---	
1,1,2,2-Tetrachloroethane	894	---	50.0	ug/kg wet	50	1000	---	89	80 - 120%	---	---	
Tetrachloroethene (PCE)	1050	---	25.0	ug/kg wet	50	1000	---	105	80 - 120%	---	---	
Toluene	920	---	50.0	ug/kg wet	50	1000	---	92	80 - 120%	---	---	
1,2,3-Trichlorobenzene	932	---	250	ug/kg wet	50	1000	---	93	80 - 120%	---	---	
1,2,4-Trichlorobenzene	929	---	250	ug/kg wet	50	1000	---	93	80 - 120%	---	---	
1,1,1-Trichloroethane	934	---	25.0	ug/kg wet	50	1000	---	93	80 - 120%	---	---	
1,1,2-Trichloroethane	976	---	25.0	ug/kg wet	50	1000	---	98	80 - 120%	---	---	
Trichloroethene (TCE)	882	---	25.0	ug/kg wet	50	1000	---	88	80 - 120%	---	---	
Trichlorofluoromethane	1080	---	100	ug/kg wet	50	1000	---	108	80 - 120%	---	---	
1,2,3-Trichloropropane	998	---	50.0	ug/kg wet	50	1000	---	100	80 - 120%	---	---	
1,2,4-Trimethylbenzene	998	---	50.0	ug/kg wet	50	1000	---	100	80 - 120%	---	---	
1,3,5-Trimethylbenzene	1020	---	50.0	ug/kg wet	50	1000	---	102	80 - 120%	---	---	

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Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Volatile Organic Compounds by EPA 8260D

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012671 - EPA 5035A							**Soil**					
LCS (1012671-BS2)		Prepared: 01/08/21 09:00		Analyzed: 01/08/21 12:33								
Vinyl chloride	907	---	25.0	ug/kg wet	50	1000	---	91	80 - 120%	---	---	
m,p-Xylene	1980	---	50.0	ug/kg wet	50	2000	---	99	80 - 120%	---	---	
o-Xylene	957	---	25.0	ug/kg wet	50	1000	---	96	80 - 120%	---	---	
Surr: 1,4-Difluorobenzene (Surr)			*Recovery: 89 %*		*Limits: 80-120 %*				*Dilution: 1x*			
Toluene-d8 (Surr)			*102 %*		*80-120 %*				*"*			
4-Bromofluorobenzene (Surr)			*97 %*		*79-120 %*				*"*			

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Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 1012447 - Total Solids (Dry Weight)									Soil			
Duplicate (1012447-DUP2)		Prepared: 01/04/21 07:28		Analyzed: 01/05/21 07:29								
QC Source Sample: B-5(4.0-5.0)122920 (A0L1061-12)												
EPA 8000D												
% Solids	**91.5**	---	1.00	%	1	---	91.7	---	---	0.2	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

SAMPLE PREPARATION INFORMATION

Volatile Organic Compounds by EPA 8260D

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1012500							
A0L1061-01	Soil	5035A/8260D	12/29/20 15:40	12/29/20 15:40	6.46g/5mL	5g/5mL	0.77
A0L1061-02	Soil	5035A/8260D	12/29/20 16:00	12/29/20 16:00	5.2g/5mL	5g/5mL	0.96
A0L1061-03	Soil	5035A/8260D	12/30/20 11:22	12/30/20 11:22	6.96g/5mL	5g/5mL	0.72
A0L1061-04	Soil	5035A/8260D	12/30/20 13:58	12/30/20 13:58	5.82g/5mL	5g/5mL	0.86
A0L1061-05	Soil	5035A/8260D	12/30/20 15:45	12/30/20 15:45	5.77g/5mL	5g/5mL	0.87
A0L1061-07	Soil	5035A/8260D	12/30/20 17:45	12/30/20 17:45	5.95g/5mL	5g/5mL	0.84
A0L1061-08	Soil	5035A/8260D	12/28/20 14:50	12/28/20 14:50	4.28g/5mL	5g/5mL	1.17
A0L1061-09	Soil	5035A/8260D	12/28/20 16:30	12/28/20 16:30	6.13g/5mL	5g/5mL	0.82
A0L1061-10	Soil	5035A/8260D	12/29/20 09:20	12/29/20 09:20	6.45g/5mL	5g/5mL	0.78
Batch: 1012618							
A0L1061-12	Soil	5035A/8260D	12/29/20 10:10	12/29/20 10:10	4.98g/5mL	5g/5mL	1.00
A0L1061-13	Soil	5035A/8260D	12/31/20 08:40	12/31/20 08:40	5.92g/5mL	5g/5mL	0.85
A0L1061-14	Soil	5035A/8260D	12/31/20 09:38	12/31/20 09:38	5.05g/5mL	5g/5mL	0.99
A0L1061-15	Soil	5035A/8260D	12/31/20 09:55	12/31/20 09:55	5.25g/5mL	5g/5mL	0.95
Batch: 1012671							
A0L1061-11RE1	Soil	5035A/8260D	12/29/20 09:55	12/29/20 09:55	4.77g/5mL	5g/5mL	1.05

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 1012447							
A0L1061-01	Soil	EPA 8000D	12/29/20 15:40	01/04/21 07:28			NA
A0L1061-02	Soil	EPA 8000D	12/29/20 16:00	01/04/21 07:28			NA
A0L1061-03	Soil	EPA 8000D	12/30/20 11:22	01/04/21 07:28			NA
A0L1061-04	Soil	EPA 8000D	12/30/20 13:58	01/04/21 07:28			NA
A0L1061-05	Soil	EPA 8000D	12/30/20 15:45	01/04/21 07:28			NA
A0L1061-07	Soil	EPA 8000D	12/30/20 17:45	01/04/21 07:28			NA
A0L1061-08	Soil	EPA 8000D	12/28/20 14:50	01/04/21 07:28			NA
A0L1061-09	Soil	EPA 8000D	12/28/20 16:30	01/04/21 07:28			NA
A0L1061-10	Soil	EPA 8000D	12/29/20 09:20	01/04/21 07:28			NA
A0L1061-11	Soil	EPA 8000D	12/29/20 09:55	01/04/21 07:28			NA
A0L1061-12	Soil	EPA 8000D	12/29/20 10:10	01/04/21 07:28			NA
A0L1061-13	Soil	EPA 8000D	12/31/20 08:40	01/04/21 07:28			NA
A0L1061-14	Soil	EPA 8000D	12/31/20 09:38	01/04/21 07:28			NA

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6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A0L1061-15	Soil	EPA 8000D	12/31/20 09:55	01/04/21 07:28			NA

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Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

Q-55 Daily CCV/LCS recovery for this analyte was below the +/-20% criteria listed in EPA 8260, however there is adequate sensitivity to ensure detection at the reporting level.

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported.

RPD Relative Percent Difference. RPDs for Matrix Spikes and Matrix Spike Duplicates are based on concentration, not recovery.

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.

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Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the sample results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories maintains detailed records on sample receipt, including client label verification, cooler temperature, sample preservation, hold

Apex Laboratories

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Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

LABORATORY ACCREDITATION INFORMATION

ORELAP Certification ID: OR100062 (Primary Accreditation)
EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories

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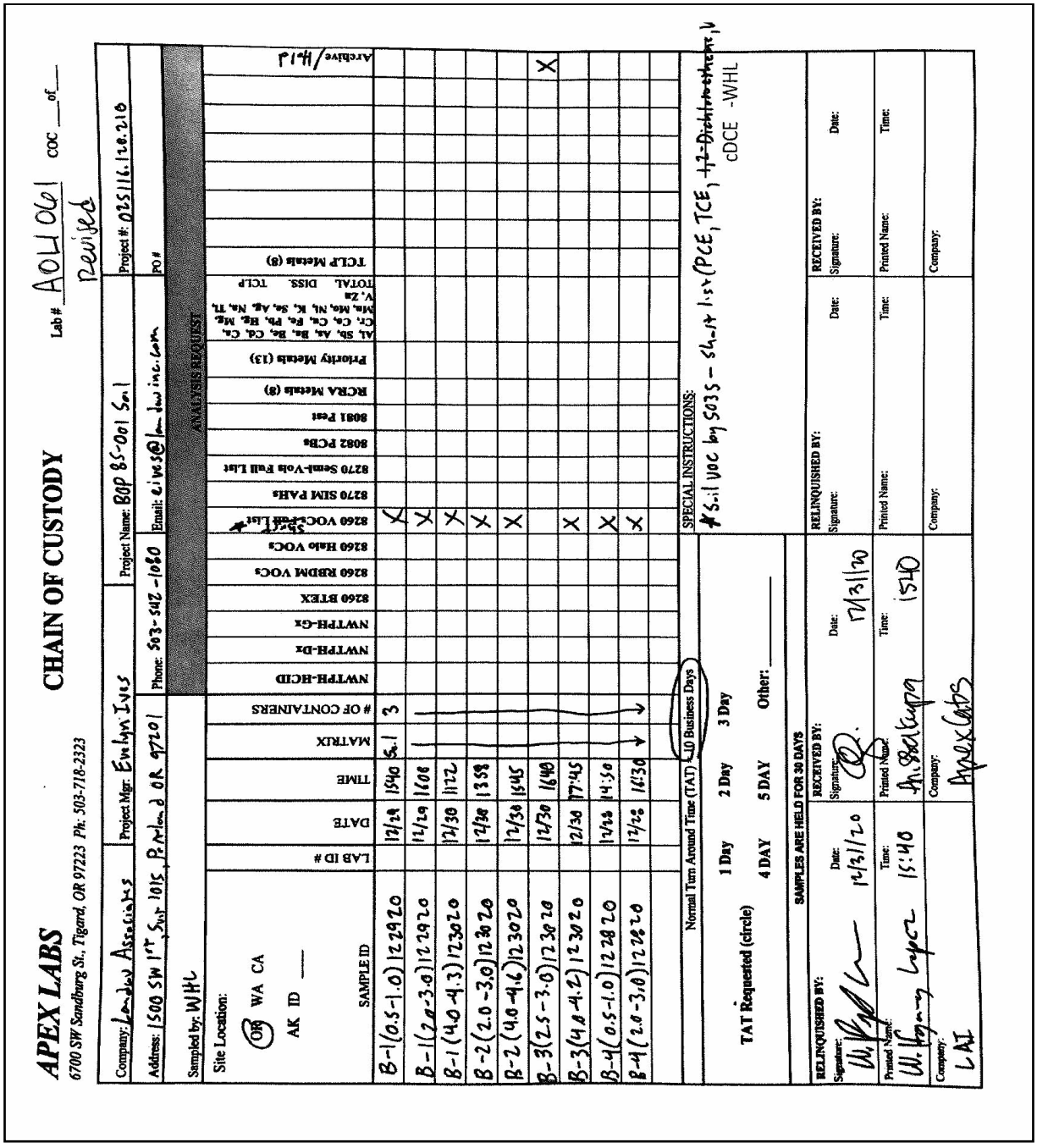

APEX LABS — **CHAIN OF CUSTODY** — Lab # A0L1061 — COC __ of __ — Revised

6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Company: Landau Associates — Project Mgr: Evelyn Ives — Project Name: BOP 85-001 Soil — Project #: 025116.120.210

Address: 1500 SW 1st Ste 1015, Portland OR 97201 — Phone: 503-542-1080 — Email: eives@landauinc.com — PO #

Sampled by: WHL

Site Location: OR WA CA AK ID ___

ANALYSIS REQUEST

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Short List*	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pest	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	Archive/Hold
B-1(0.5-1.0)121920		12/19	1540	S.I	3							X									
B-1(2.0-3.0)121920		12/19	1608									X									
B-1(4.0-4.3)123020		12/30	1122									X									
B-2(2.0-3.0)123020		12/30	1358									X									
B-2(4.0-4.6)123020		12/30	1545									X									
B-3(2.5-3.0)123020		12/30	1640																		X
B-3(4.0-4.2)123020		12/30	17:45									X									
B-4(0.5-1.0)122820		12/28	14:30									X									
B-4(2.0-3.0)122820		12/28	1430									X									

Normal Turn Around Time (TAT) (10 Business Days)

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: ___

SPECIAL INSTRUCTIONS: #S.1 VOC by 5035 – SW-846 1,1,1-TCE (PCE, TCE, ~~1,2-Dichloroethene~~, cDCE -WHL

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature:	Signature:	Signature:	Signature:
Date: 12/31/20	Date: 12/31/20	Date:	Date:
Time: 15:40	Time: 1540	Time:	Time:
Printed Name: W. Hyung Lee	Printed Name: A. Bartkiewicz	Printed Name:	Printed Name:
Company: LAI	Company: Apex Labs	Company:	Company:

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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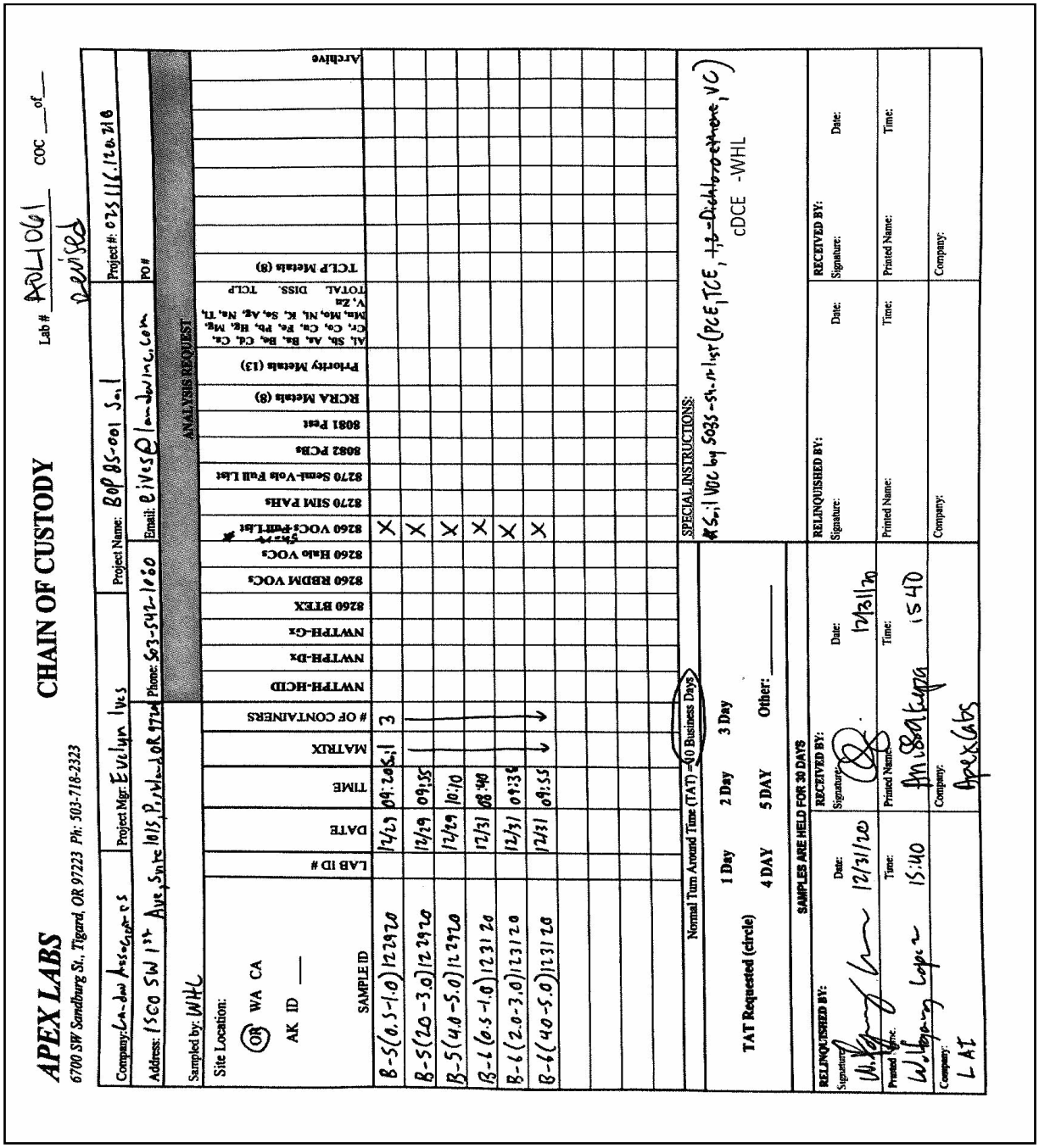
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**



APEX LABS — **CHAIN OF CUSTODY**

6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

Lab # A0L1061 COC ___ of ___

Company: Landau Associates | Project Mgr: Evelyn Ives | Project Name: BOP 85-001 S.1 | Project #: 025116.120.210

Address: 1500 SW 1st Ave, Suite 1015, Portland, OR 97201 | Phone: 503-542-1080 | Email: eives@landauinc.com | PO#

Sampled by: WHL

Site Location: (OR) WA CA AK ID ___

ANALYSIS REQUEST

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 Short-Tail List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pest	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	Archive
B-5(0.5-1.0)122820		12/23	09:20	S	3							X									
B-5(20-30)122820		12/29	09:35									X									
B-5(40-50)122820		12/29	10:10									X									
B-6(0.5-1.0)123120		12/31	08:40									X									
B-6(20-30)123120		12/31	09:30									X									
B-6(40-50)123120		12/31	09:55									X									

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: ___

SPECIAL INSTRUCTIONS: #8,1 VOC by 8035-SIM-PAH (PCE, TCE, 1,2-Dichloroethene, VC) cDCE -WHL

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:	12/31/20		Signature:	12/31/20	
Printed Name:		15:40	Printed Name:		15:40
Company:			Company:	Apex Labs	

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:			Signature:		
Printed Name:			Printed Name:		
Company:			Company:		

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:			Signature:		
Printed Name:			Printed Name:		
Company:			Company:		

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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Tigard, OR 97223
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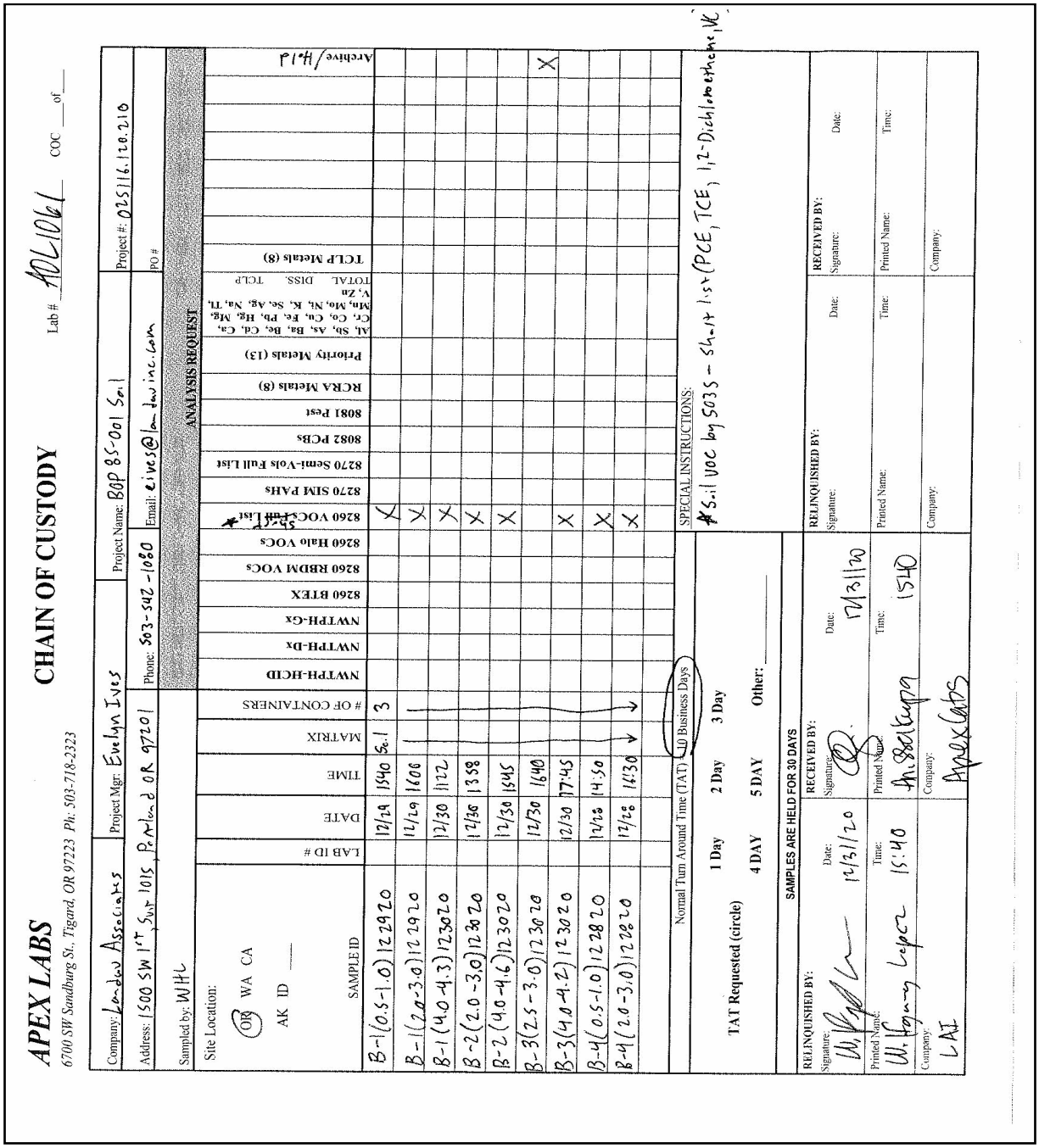
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**



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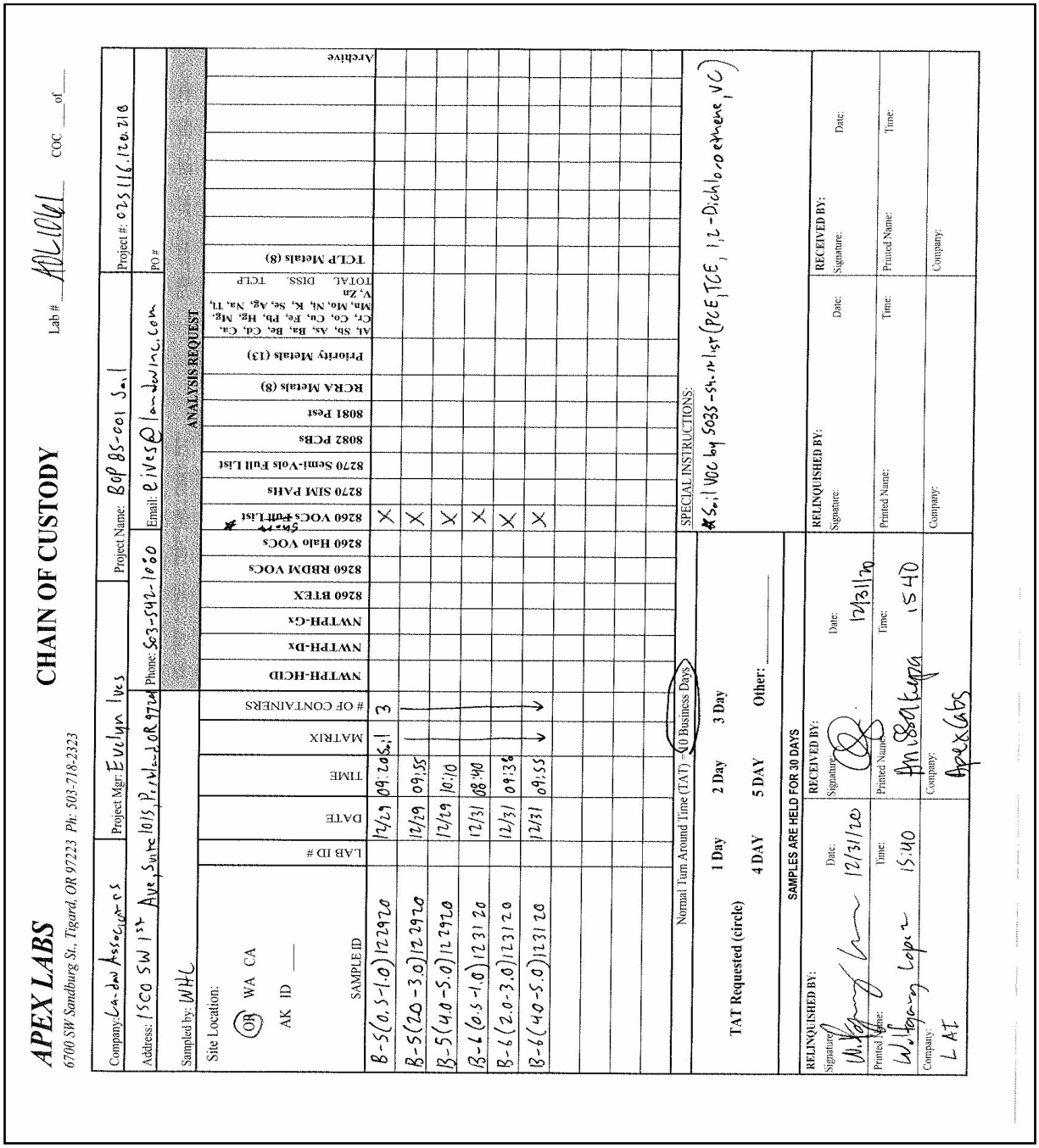
Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**



APEX LABS
6700 SW Sandburg St., Tigard, OR 97223 Ph: 503-718-2323

CHAIN OF CUSTODY

Lab # A0L1061 COC ___ of ___

Company: Landau Associates | Project Mgr: Evelyn Ives | Project Name: BGP GS-001 Soil | Project #: 025116.120.210
Address: 1500 SW 1st Ave, Suite 1015, Portland, OR 97201 | Phone: 503-542-1080 | Email: eives@landauinc.com | PO #
Sampled by: WHL

Site Location: (OR) WA CA AK ID ___

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 BTEX	8260 RBDM VOCs	8260 Halo VOCs	8260 VOCs Full List	8270 SIM PAHs	8270 Semi-Vols Full List	8082 PCBs	8081 Pest	RCRA Metals (8)	Priority Metals (13)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS. TCLP	TCLP Metals (8)	Archive
B-5(0.5-1.0)122920		12/29	09:20	Soil	3							X								
B-5(20-30)122920		12/29	09:55									X								
B-5(40-50)122920		12/29	10:10									X								
B-6(0.5-1.0)123120		12/31	08:40									X								
B-6(20-30)123120		12/31	09:36									X								
B-6(40-50)123120		12/31	09:55	↓	↓							X								

Normal Turn Around Time (TAT) = 10 Business Days

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other: ___

SPECIAL INSTRUCTIONS:
#Soil VOC by 8035-SIM (PCE, TCE, 1,2-Dichloroethene, VC)

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:	12/31/20		Signature:	12/31/20	
Printed Name:		15:40	Printed Name:		15:40
Company:	L AT		Company:	Apex Labs	

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:			Signature:		
Printed Name:			Printed Name:		
Company:			Company:		

RELINQUISHED BY:	Date:	Time:	RECEIVED BY:	Date:	Time:
Signature:			Signature:		
Printed Name:			Printed Name:		
Company:			Company:		

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Apex Laboratories, LLC
6700 S.W. Sandburg Street
Tigard, OR 97223
503-718-2323
ORELAP ID: **OR100062**

Landau Associates	Project: **Boeing Portland**	
1500 SW First Avenue Suite 1015	Project Number: **025116.120.210**	**Report ID:**
Portland, OR 97201	Project Manager: **Evelyn Ives**	**A0L1061 - 01 14 21 1536**

APEX LABS COOLER RECEIPT FORM

Client: Landau Associates Element WO#: A0 L1061

Project/Project #: BOP 85-001 Soil #025116.120.210

Delivery Info:

Date/time received: 12/31/20 @ 1540 By: AKK

Delivered by: Apex X Client ESS FedEx UPS Swift Senvoy SDS Other

Cooler Inspection Date/time inspected: 12/31/20 @ ~~1540~~ 1630 By: AKK
akk 12/31/20

Chain of Custody included? Yes X No Custody seals? Yes No X

Signed/dated by client? Yes X No

Signed/dated by Apex? Yes X No

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (°C)	2.6						
Received on ice? (Y/N)	Y						
Temp. blanks? (Y/N)	N						
Ice type: (Gel/Real/Other)	Real						
Condition:	Good						

Cooler out of temp? (Y/N) Possible reason why:

If some coolers are in temp and some out, were green dots applied to out of temperature samples? Yes/No/NA

Out of temperature samples form initiated? Yes/No/NA

Samples Inspection: Date/time inspected: 12/31/20 @ 1639 By: (illegible)

All samples intact? Yes X No Comments:

Bottle labels/COCs agree? Yes No X Comments: 1/2 VOAs B-4(0.5-1.0)122820 reads T of, 1455, 2/2 VOAs B-6(0.5-1.0)123120 + B-6(2.0-3.0)123120 missing "6" in ID

COC/container discrepancies form initiated? Yes No X

Containers/volumes received appropriate for analysis? Yes X No Comments:

Do VOA vials have visible headspace? Yes No NA X

Comments

Water samples: pH checked: Yes No NA X pH appropriate? Yes No NA Y

Comments:

Additional information:

Labeled by: VS Witness: (illegible) Cooler Inspected by: AKK See Project Contact Form: Y

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager