Technical Memorandum

TO: Steve Teal, Washington State Department of Ecology

CC: Amy Sikora, Washington State Department of Natural Resources

FROM: Katie Gauglitz, LG

DATE: July 29, 2022

RE: **Second Quarter 2022 Groundwater Monitoring Results**
Webster Nursery Site, Site Identification 3380
Tumwater, Washington
Project No. 0774006.040.047

Introduction

This technical memorandum summarizes the results of quarterly groundwater monitoring completed by Landau Associates, Inc. (Landau) at the Washington State Department of Natural Resources Webster Nursery site, a former pesticide-storage warehouse in Tumwater, Washington (Site; Figure 1). The Site is associated with past releases of organochlorine pesticides to soil and groundwater. Constituents of concern include the organochlorine pesticides heptachlor epoxide (HE; breakdown product of heptachlor) and chlordanes.

Remedial action excavation and disposal of HE-contaminated soil was completed in August 2018. A summary of the remedial action is provided in a Cleanup Action Completion Report (Landau 2020).

Groundwater Monitoring

Second quarter 2022 (2Q22) groundwater monitoring was completed on May 24, 2022 in accordance with the framework established by Washington State Department of Ecology (Ecology) Agreed Order Number DE 00TCP-SR295, the Remedial Action Work Plan (Landau 2017), and the Compliance Monitoring Plan (Landau 2019).

Groundwater samples were collected from two wells (SW-10R and SW-11R; Figure 2) using a peristaltic pump and dedicated tubing following low-flow groundwater sampling procedures. Low-flow groundwater monitoring consists of measuring the depth-to-water with an electronic groundwater level indicator, monitoring field parameters with a YSI Professional Plus multi-parameter instrument, and measuring turbidity with a handheld meter. One duplicate sample (SW-99 at SW-11R) was collected for quality control purposes. Analytical Resources, Inc. of Tukwila, Washington analyzed the groundwater samples for organochlorine pesticides using U.S. Environmental Protection Agency Method 8081B low-level.

Groundwater Monitoring Results

Groundwater monitoring results are summarized below:

- HE was detected in the duplicate sample of SW-11R (i.e., SW-99) at a concentration of 0.001 micrograms per liter (µg/L), which is below the cleanup level (CUL; 0.0048 µg/L). HE was not detected above the laboratory reporting limit in the parent sample (the laboratory reporting limit for HE at SW-11R was 0.002 µg/L in 2Q22).
- No other analytes were detected in either well during 2Q22 groundwater monitoring.

May 2022 organochlorine pesticide data are provided in Table 1, and the laboratory data package is provided in Attachment 1. Time series data of recent HE concentrations in groundwater at SW-10R and SW-11R (dating back to January 2010) are presented on Figure 3. A review of historical trends indicates HE concentrations are lower during the wet season (HE was also not detected above the laboratory reporting limit in SW-10R and SW-11R in February 2022). Concentrations of HE are expected to rebound slightly during the upcoming dry season, however overall concentrations of HE appear to be decreasing over time.

Groundwater elevations at SW-10R and SW-11R were 187.76 and 187.47 feet mean sea level, respectively. This represents an approximate 0.5-foot decrease from the previous monitoring event, completed in February 2022. Depth-to-water and groundwater elevation data are provided in Table 2 and SW-10R groundwater elevation data collected since the remedial action is shown on Figure 3. Figure 3 indicates that the groundwater elevation measured during May 2022 was relatively high compared to that time in previous years, and very similar to February 2022, based on historical trends.

Environmental Information Management Submittal

An Environmental Information Management (EIM) submittal is required. The 2Q22 submittal was completed on July 8, 2022, and confirmation that the results have been uploaded to the EIM database is pending.

Conclusions and Next Steps

Landau will continue to conduct quarterly monitoring through May 2023. The next monitoring event is scheduled for August 2022.

Use of this Report

This technical memorandum has been prepared for the exclusive use of Washington State Department of Natural Resources and Washington State Department of Ecology for specific application to the Webster Nursery site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of Landau Associates. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Landau Associates, shall be at the user's sole risk. Landau Associates warrants that within the

limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. Landau Associates makes no other warranty, either express or implied.

This document has been prepared under the supervision and direction of the following key staff.

LANDAU ASSOCIATES, INC.

Katie Gauglitz, LG
Senior Project Geologist

SMR/KMG/SMM/kjg
[\\TACOMA3\PROJECT\774\006 WEBSTER\R\QUARTERLY GW MONITORING REPORTS\2022_05_2Q22\LAI_WEBSTER NURSERY 2Q22 GW MONITORING_TM_07-29-22.DOCX]

References

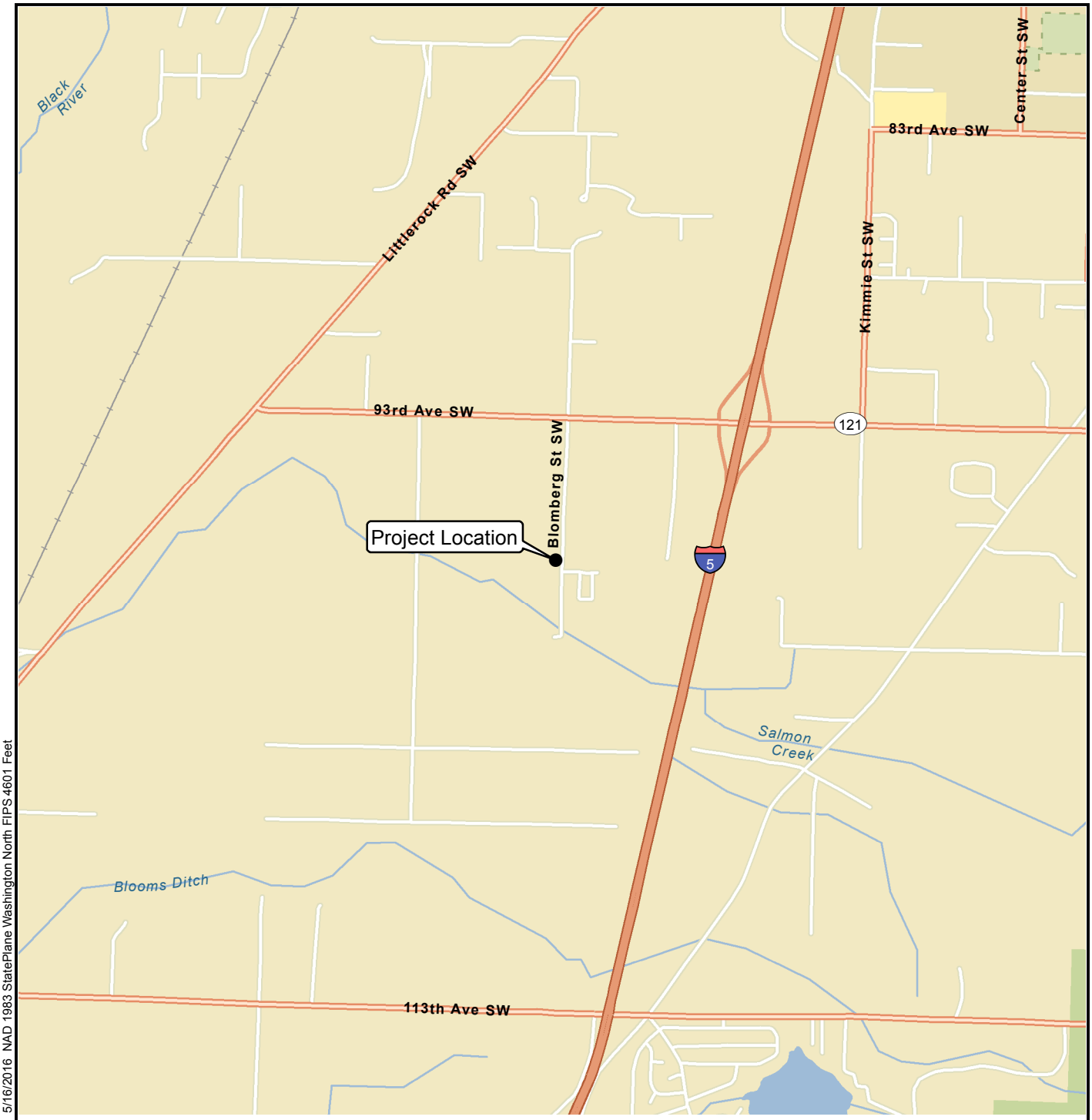
Landau. 2017. Remedial Action Work Plan, Webster Nursery, 9805 Blomberg Street SW, Tumwater, Washington. Landau Associates, Inc. October 31.

Landau. 2019. Compliance Monitoring Plan, Washington State Department of Natural Resources Webster Nursery, Tumwater, Washington. Landau Associates, Inc. July 24.

Landau. 2020. Final: Cleanup Action Completion Report, Washington State Department of Natural Resources Webster Nursery, Tumwater, Washington. Landau Associates, Inc. May 29.

Attachments

Figure 1	Vicinity Map
Figure 2	Monitoring Well Network
Figure 3	Heptachlor Epoxide and Groundwater Elevation Time Series SW-10(R) and SW-11(R)
Table 1	Groundwater Analytical Results
Table 2	Groundwater Level Measurements
Attachment 1	May 2022 Laboratory Data Packages



N

0 0.5 1

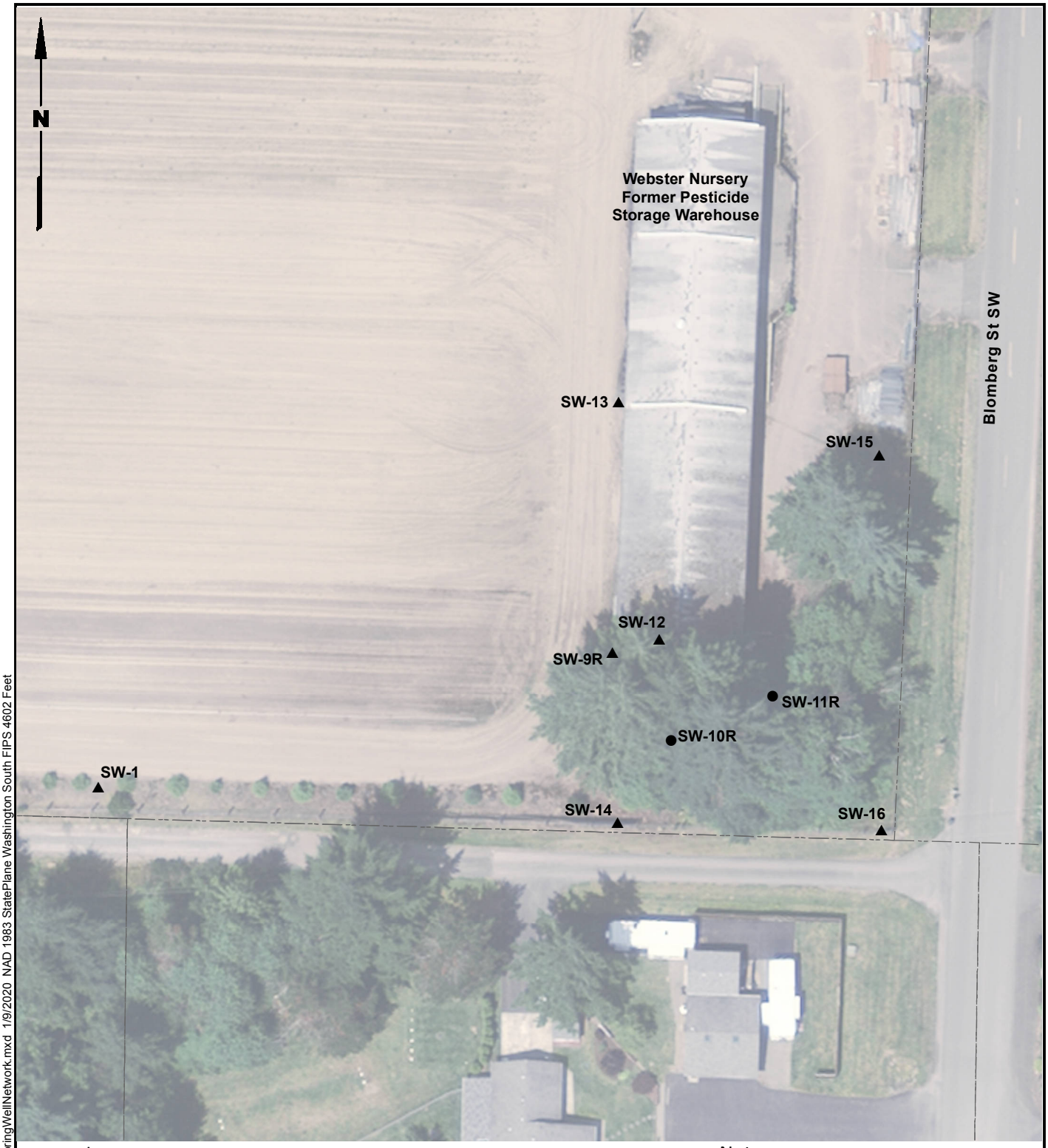
Miles

Data Source: Esri 2012

G:\Projects\774\006\020\026\FSIF01 VicinityMap.mxd 5/16/2016 NAD 1983 StatePlane Washington North FIPS 4601 Feet

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Vicinity Map**	Figure 1



G:\Projects\774\006\040\045\F02MonitoringWellNetwork.mxd 1/9/2020 NAD 1983 StatePlane Washington South FIPS 4602 Feet

Legend

- ● Pesticide Monitoring Well
- ▲ Other Monitoring Well
- Tax Parcels

0 50 100

Scale in Feet

Notes

1. SW-9R, SW-10R, and SW-11R are new (replacement) wells.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Thurston County GIS; WA DNR Survey, 2018.

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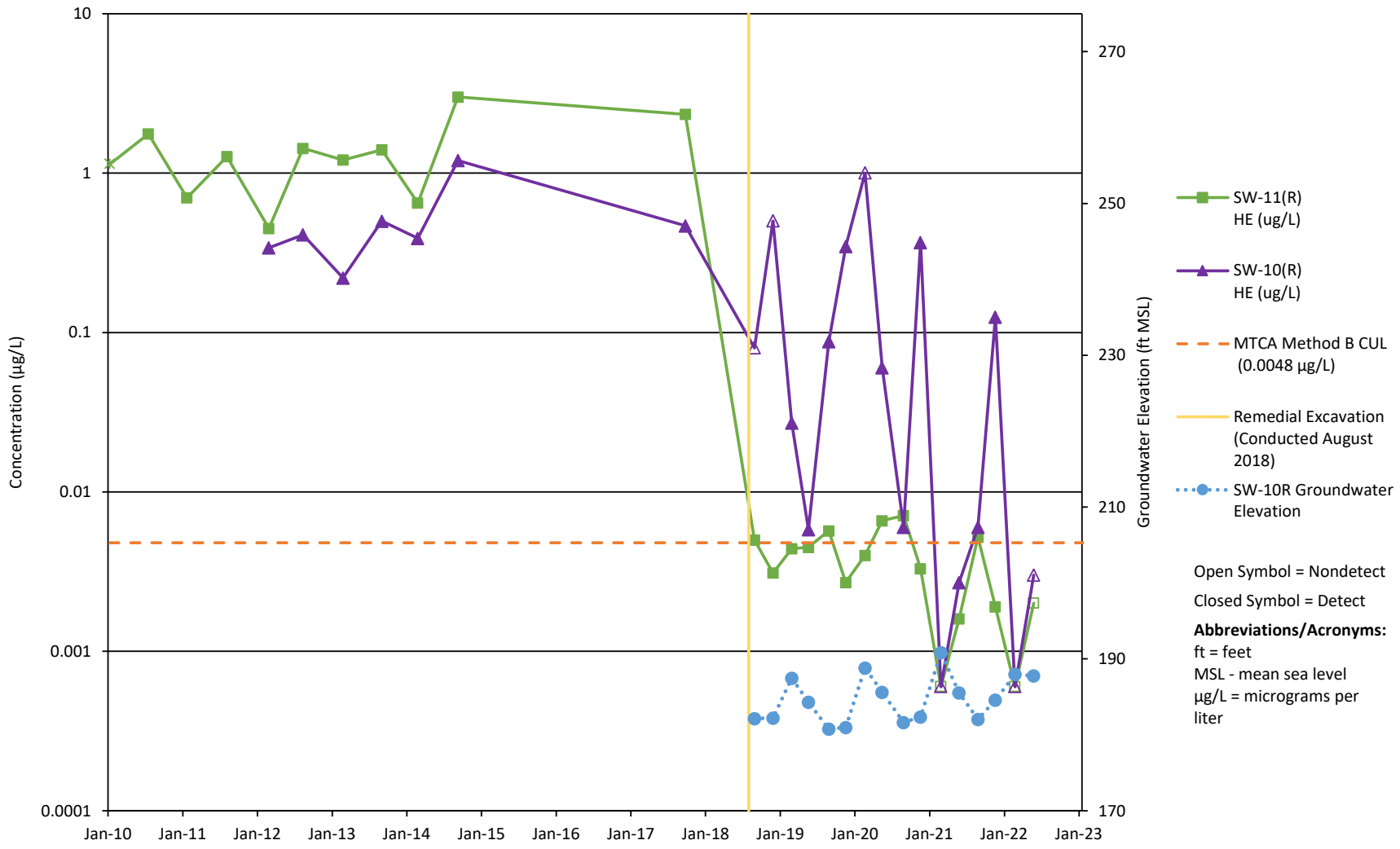
Webster Nursery Site Tumwater, Washington	**Monitoring Well Network**	Figure 2

\\tacoma3\PROJECT\774\006 Webster\R\Quarterly GW Monitoring Reports\2022_05_2Q22\Figures\F03_HE and GWE Timeseries 2Q



LANDAU ASSOCIATES

Webster Nursery Site
Tumwater, Washington

Heptachlor Epoxide and Groundwater Elevation Time Series SW-10(R) and SW-11(R)

Figure
3

Table 1
Groundwater Analytical Results
Webster Nursery
Tumwater, Washington

Analyte	MTCA Method B Cleanup Levels Cancerous	Sample Location, Sample ID, Laboratory SDG, Sample Date, and Sample Type SW-10R SW-10R-20220524 22E0392 5/24/2022 N	 SW-11R SW-11R-20220524 22E0392 5/24/2022 N	 SW-11R SW-99-20220524 22E0392 5/24/2022 FD
Pesticides (µg/L; SW-846 8081B)				
4,4'-DDD	--	0.0013 U	0.0013 U	0.0013 U
4,4'-DDE	--	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT	--	0.0013 U	0.0013 U	0.0013 U
Aldrin	--	0.0006 U	0.0006 U	0.0006 U
alpha-BHC	--	0.0006 U	0.0006 U	0.0006 U
beta-BHC	--	0.0006 U	0.0006 U	0.0006 U
Chlordane	0.25	0.0050 U	0.0050 U	0.0050 U
cis-Chlordane	--	0.0006 U	0.0006 U	0.0006 U
delta-BHC	--	0.0006 U	0.0006 U	0.0006 U
Dieldrin	--	0.0013 U	0.0013 U	0.0013 U
Endosulfan I	--	0.0006 U	0.0006 U	0.0006 U
Endosulfan II	--	0.0013 U	0.0013 U	0.0013 U
Endosulfan Sulfate	--	0.0013 U	0.0013 U	0.0013 U
Endrin	--	0.0013 U	0.0013 U	0.0013 U
Endrin Aldehyde	--	0.0013 U	0.0013 U	0.0013 U
Endrin Ketone	--	0.0013 U	0.0013 U	0.0013 U
gamma-BHC	--	0.0006 U	0.0006 U	0.0006 U
Heptachlor	0.0194	0.0006 U	0.0006 U	0.0006 U
Heptachlor Epoxide	0.0048	0.0030 U	0.0020 U	**0.0010**
Methoxychlor	--	0.0063 U	0.0063 U	0.0063 U
Toxaphene	--	0.0625 U	0.0625 U	0.0625 U
trans-Chlordane	--	0.0006 U	0.0006 U	0.0006 U

Notes:

-- = cleanup level not applicable

Bold text = Indicates detected analyte.

Green Box = Detected concentration is greater than the cleanup level

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

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

Abbreviations and Acronyms:

FD = field duplicate

ID = identification

µg/L = micrograms per liter

Table 2
Groundwater Level Measurements
Webster Nursery
Tumwater, Washington

Well ID	Top of Casing Elevation (ft)	Depth to Water (ft bgs)	Groundwater Elevation (ft)
SW-10R	193.41	5.65	187.76
SW-11R	192.50	5.03	187.47

Notes:
Groundwater elevation data was measured February 22, 2022.

Abbreviations:
bgs = below ground surface
ft = feet
ID = identification

Attachment 1

May 2022 Laboratory Data Package

Analytical Resources, LLC
Analytical Chemists and Consultants

21 June 2022

Sierra Mott
Landau Associates, Inc. - Tacoma
2107 South C Street
Tacoma, WA 98402

RE: Webster Nursery (0774006.040.047 (2Q Sampling))

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

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

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

Associated Work Order(s)	Associated SDG ID(s)
22E0392	N/A

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

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

Analytical Resources, LLC

Kelly Bottem, 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.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006-012

22E0392

LANDAU ASSOCIATES

Chain-of-Custody Record

☐ North Seattle (206) 631-8660 ☒ Tacoma (253) 926-2493 ☐ Olympia (360) 791-3178
☐ Spokane (509) 327-9737 ☐ Portland (503) 542-1080 ☐ _____

Date 5/24/22 Page 1 of 1

Turnaround Time: (Standard) / Accelerated

Project Name Webster Nursery Project No. 077400.040.047
Project Location/Event Olympia, WA / 2Q Sampling
Sampler's Name SMR
Project Contact Katie Gauglitz
Send Results To K. Gauglitz, D. Jorgensen, S. Mott, E. Weber

Special Handling Requirements: _____
Shipment Method: _____
Stored on ice: (Yes) / No

Sample I.D.	Date	Time	Matrix	No. of Containers	Testing Parameters: organochlorine pesticides (8081B)	Observations/Comments
SW-10R-20220524	5/24/22	936	Aq	2	X	3.4°C
SW-11R-20220524	↓	1015	↓	2	X	
SW-99-20220524	↓	1016	↓	2	X	
		(SMR)				

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

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

___ Dissolved metal samples were field filtered

Other _____

Relinquished by	Received by	Relinquished by	Received by
Signature SMR	Signature Rm	Signature	Signature
Printed Name Simone Rodriguez	Printed Name Roman Miller	Printed Name	Printed Name
Company Landau Associates	Company ARR	Company	Company
Date 5/24/22 Time 1131	Date 5/24/22 Time 1131	Date Time	Date Time

WHITE COPY - Laboratory YELLOW COPY - Project File PINK COPY - Client Representative

10/2018

Analytical Resources, LLC
Analytical Chemists and Consultants

Analytical Report

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-10R-20220524	22E0392-01	Water	24-May-2022 09:36	24-May-2022 11:31
SW-11R-20220524	22E0392-02	Water	24-May-2022 10:15	24-May-2022 11:31
SW-99-20220524	22E0392-03	Water	24-May-2022 10:16	24-May-2022 11:31

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

Work Order Case Narrative

Pesticides - EPA Method SW8081B

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The blank spike (BS/LCS) percent recoveries were within control limits with the exception of analytes flagged on the associated forms.

Analytical Resources, LLC
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau

COC No(s): NA

Assigned ARI Job No: 22E0392

Project Name: webster nursery

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

Tracking No: NA

Preliminary Examination Phase:

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.4

Time 1131

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

Temp Gun ID#: 2565

Cooler Accepted by: RA Date: 5-24-22 Time: 1131

Complete custody forms and attach all shipping documents

Log-In Phase:

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

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

Samples Logged by: Date: 05/24/2022 Time: 1513 Labels checked by: SLF

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

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

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

SW-10R-20220524

22E0392-01 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 05/24/2022 09:36

Instrument: ECD6 Analyst: yz — Analyzed: 06/16/2022 16:51

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 22E0392-01 A 01
	Preparation Batch: BKE0709	Sample Size: 1000 mL	
	Prepared: 05/31/2022	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 22E0392-01 A 01
	Cleanup Batch: CKF0105	Initial Volume: 0.5 uL	
	Cleaned: 14-Jun-2022	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:22E0392-01 A 01
	Cleanup Batch: CKF0104	Initial Volume: 0.5 uL	
	Cleaned: 14-Jun-2022	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0030	ND	ug/L	Y1, U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.0013	ND	ug/L	U
Dieldrin	60-57-1	1	0.0013	ND	ug/L	U
Endrin	72-20-8	1	0.0013	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.0013	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.0013	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.0013	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.0013	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.0013	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.0013	ND	ug/L	U
Methoxychlor	72-43-5	1	0.0063	ND	ug/L	U
Toxaphene	8001-35-2	1	0.0625	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.0050	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*109*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*102*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*49.2*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*42.9*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

SW-11R-20220524

22E0392-02 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 05/24/2022 10:15

Instrument: ECD6 Analyst: YZ — Analyzed: 06/16/2022 17:09

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 22E0392-02 A 01
	Preparation Batch: BKE0709	Sample Size: 1000 mL	
	Prepared: 05/31/2022	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 22E0392-02 A 01
	Cleanup Batch: CKF0105	Initial Volume: 0.5 uL	
	Cleaned: 14-Jun-2022	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:22E0392-02 A 01
	Cleanup Batch: CKF0104	Initial Volume: 0.5 uL	
	Cleaned: 14-Jun-2022	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0020	ND	ug/L	Y1, U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.0013	ND	ug/L	U
Dieldrin	60-57-1	1	0.0013	ND	ug/L	U
Endrin	72-20-8	1	0.0013	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.0013	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.0013	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.0013	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.0013	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.0013	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.0013	ND	ug/L	U
Methoxychlor	72-43-5	1	0.0063	ND	ug/L	U
Toxaphene	8001-35-2	1	0.0625	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.0050	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*136*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*121*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*54.2*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*54.8*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

SW-99-20220524

22E0392-03 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 05/24/2022 10:16

Instrument: ECD6 Analyst: yz — Analyzed: 06/16/2022 17:28

Analysis by: Analytical Resources, LLC

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 22E0392-03 A 01
	Preparation Batch: BKE0709	Sample Size: 1000 mL	
	Prepared: 05/31/2022	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 22E0392-03 A 01
	Cleanup Batch: CKF0105	Initial Volume: 0.5 uL	
	Cleaned: 14-Jun-2022	Final Volume: 0.5 uL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:22E0392-03 A 01
	Cleanup Batch: CKF0104	Initial Volume: 0.5 uL	
	Cleaned: 14-Jun-2022	Final Volume: 0.5 uL	

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	0.0010	ug/L	
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.0013	ND	ug/L	U
Dieldrin	60-57-1	1	0.0013	ND	ug/L	U
Endrin	72-20-8	1	0.0013	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.0013	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.0013	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.0013	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.0013	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.0013	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.0013	ND	ug/L	U
Methoxychlor	72-43-5	1	0.0063	ND	ug/L	U
Toxaphene	8001-35-2	1	0.0625	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.0050	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*125*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*110*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*49.3*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*52.5*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

Analysis by: Analytical Resources, LLC

Chlorinated Pesticides - Quality Control

Batch BKE0709 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BKE0709-BLK1)				Prepared: 31-May-2022 Analyzed: 16-Jun-2022 15:19						
alpha-BHC	ND	0.0006	ug/L							U
beta-BHC	ND	0.0006	ug/L							U
gamma-BHC (Lindane)	ND	0.0006	ug/L							U
delta-BHC	ND	0.0006	ug/L							U
Heptachlor	ND	0.0006	ug/L							U
Aldrin	ND	0.0006	ug/L							U
Heptachlor Epoxide	ND	0.0006	ug/L							U
trans-Chlordane (beta-Chlordane)	ND	0.0006	ug/L							U
cis-Chlordane (alpha-chlordane)	ND	0.0006	ug/L							U
Endosulfan I	ND	0.0006	ug/L							U
4,4'-DDE	ND	0.0013	ug/L							U
Dieldrin	ND	0.0013	ug/L							U
Endrin	ND	0.0013	ug/L							U
Endosulfan II	ND	0.0013	ug/L							U
4,4'-DDD	ND	0.0013	ug/L							U
Endrin Aldehyde	ND	0.0013	ug/L							U
4,4'-DDT	ND	0.0013	ug/L							U
Endosulfan Sulfate	ND	0.0013	ug/L							U
Endrin Ketone	ND	0.0013	ug/L							U
Methoxychlor	ND	0.0063	ug/L							U
Toxaphene	ND	0.0625	ug/L							U
Chlordane (NOS)	ND	0.0050	ug/L							U
Surrogate: Decachlorobiphenyl	0.0219		ug/L	*0.0200*		*109*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0202		ug/L	*0.0200*		*101*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0144		ug/L	*0.0200*		*72.1*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0160		ug/L	*0.0200*		*79.9*	*30-160*			
LCS (BKE0709-BS1)				Prepared: 31-May-2022 Analyzed: 16-Jun-2022 15:38						
alpha-BHC [2C]	0.0078	0.0006	ug/L	0.0100		77.5	30-160			
beta-BHC [2C]	0.0079	0.0006	ug/L	0.0100		78.9	30-160			
gamma-BHC (Lindane) [2C]	0.0078	0.0006	ug/L	0.0100		78.5	30-160			
delta-BHC [2C]	0.0075	0.0006	ug/L	0.0100		75.4	30-160			
Heptachlor	0.0078	0.0006	ug/L	0.0100		77.6	30-160			
Aldrin [2C]	0.0076	0.0006	ug/L	0.0100		75.7	30-160			
Heptachlor Epoxide [2C]	0.0085	0.0006	ug/L	0.0100		84.9	30-160			

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

Analysis by: Analytical Resources, LLC

Chlorinated Pesticides - Quality Control

Batch BKE0709 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BKE0709-BS1)				Prepared: 31-May-2022 Analyzed: 16-Jun-2022 15:38						
trans-Chlordane (beta-Chlordane) [2C]	0.0075	0.0006	ug/L	0.0100		74.7	30-160			
cis-Chlordane (alpha-chlordane) [2C]	0.0080	0.0006	ug/L	0.0100		79.7	30-160			
Endosulfan I [2C]	0.0082	0.0006	ug/L	0.0100		81.8	30-160			
4,4'-DDE [2C]	0.0154	0.0013	ug/L	0.0200		76.9	30-160			
Dieldrin [2C]	0.0158	0.0013	ug/L	0.0200		78.9	30-160			
Endrin [2C]	0.0160	0.0013	ug/L	0.0200		79.9	30-160			
Endosulfan II	0.0166	0.0013	ug/L	0.0200		82.8	30-160			
4,4'-DDD	0.0160	0.0013	ug/L	0.0200		79.8	30-160			
Endrin Aldehyde	0.0138	0.0013	ug/L	0.0200		69.2	30-160			
4,4'-DDT	0.0167	0.0013	ug/L	0.0200		83.5	30-160			
Endosulfan Sulfate	0.0181	0.0013	ug/L	0.0200		90.3	30-160			
Endrin Ketone	0.0180	0.0013	ug/L	0.0200		89.8	30-160			
Methoxychlor [2C]	0.0768	0.0063	ug/L	0.100		76.8	30-160			
Surrogate: Decachlorobiphenyl	0.0218		ug/L	*0.0200*		*109*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0171		ug/L	*0.0200*		*85.4*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0149		ug/L	*0.0200*		*74.7*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0160		ug/L	*0.0200*		*80.1*	*30-160*			
LCS (BKE0709-BS2)				Prepared: 31-May-2022 Analyzed: 16-Jun-2022 16:33						
Toxaphene	0.878	0.0625	ug/L	1.00		87.8	30-160			
Surrogate: Decachlorobiphenyl	0.0234		ug/L	*0.0200*		*117*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0197		ug/L	*0.0200*		*98.4*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0143		ug/L	*0.0200*		*71.5*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0144		ug/L	*0.0200*		*71.9*	*30-160*			
LCS Dup (BKE0709-BSD1)				Prepared: 31-May-2022 Analyzed: 16-Jun-2022 15:56						
alpha-BHC	0.0060	0.0006	ug/L	0.0100		60.4	30-160	20.70	30	
beta-BHC [2C]	0.0062	0.0006	ug/L	0.0100		62.1	30-160	23.80	30	
gamma-BHC (Lindane) [2C]	0.0062	0.0006	ug/L	0.0100		62.4	30-160	22.80	30	
delta-BHC [2C]	0.0062	0.0006	ug/L	0.0100		61.7	30-160	19.90	30	
Heptachlor	0.0062	0.0006	ug/L	0.0100		62.4	30-160	21.80	30	
Aldrin [2C]	0.0064	0.0006	ug/L	0.0100		63.9	30-160	16.80	30	P1
Heptachlor Epoxide [2C]	0.0069	0.0006	ug/L	0.0100		69.4	30-160	20.10	30	
trans-Chlordane (beta-Chlordane) [2C]	0.0062	0.0006	ug/L	0.0100		61.8	30-160	18.90	30	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

Analysis by: Analytical Resources, LLC

Chlorinated Pesticides - Quality Control

Batch BKE0709 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BKE0709-BSD1)				Prepared: 31-May-2022 Analyzed: 16-Jun-2022 15:56						
cis-Chlordane (alpha-chlordane) [2C]	0.0063	0.0006	ug/L	0.0100		62.9	30-160	23.70	30	
Endosulfan I [2C]	0.0066	0.0006	ug/L	0.0100		66.0	30-160	21.40	30	
4,4'-DDE [2C]	0.0123	0.0013	ug/L	0.0200		61.3	30-160	22.60	30	
Dieldrin [2C]	0.0126	0.0013	ug/L	0.0200		63.2	30-160	22.10	30	
Endrin	0.0126	0.0013	ug/L	0.0200		63.2	30-160	23.00	30	
Endosulfan II	0.0150	0.0013	ug/L	0.0200		74.9	30-160	9.93	30	
4,4'-DDD	0.0128	0.0013	ug/L	0.0200		64.0	30-160	21.90	30	
Endrin Aldehyde	0.0095	0.0013	ug/L	0.0200		47.4	30-160	37.50	30	*
4,4'-DDT	0.0129	0.0013	ug/L	0.0200		64.6	30-160	25.40	30	
Endosulfan Sulfate	0.0142	0.0013	ug/L	0.0200		70.9	30-160	24.10	30	
Endrin Ketone	0.0143	0.0013	ug/L	0.0200		71.7	30-160	22.30	30	
Methoxychlor	0.0611	0.0063	ug/L	0.100		61.1	30-160	18.20	30	
Surrogate: Decachlorobiphenyl	0.0209		ug/L	*0.0200*		*105*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0168		ug/L	*0.0200*		*84.2*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0125		ug/L	*0.0200*		*62.7*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0132		ug/L	*0.0200*		*66.1*	*30-160*			

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Certified Analyses included in this Report

Analyte	Certifications
EPA 8081B in Water	
alpha-BHC	DoD-ELAP,WADOE,NELAP
alpha-BHC [2C]	DoD-ELAP,WADOE,NELAP
beta-BHC	DoD-ELAP,WADOE,NELAP
beta-BHC [2C]	DoD-ELAP,WADOE,NELAP
gamma-BHC (Lindane)	DoD-ELAP,WADOE,NELAP
gamma-BHC (Lindane) [2C]	DoD-ELAP,WADOE,NELAP
delta-BHC	DoD-ELAP,WADOE,NELAP
delta-BHC [2C]	DoD-ELAP,WADOE,NELAP
Heptachlor	DoD-ELAP,WADOE,NELAP
Heptachlor [2C]	DoD-ELAP,WADOE,NELAP
Aldrin	DoD-ELAP,WADOE,NELAP
Aldrin [2C]	DoD-ELAP,WADOE,NELAP
Heptachlor Epoxide	DoD-ELAP,WADOE,NELAP
Heptachlor Epoxide [2C]	DoD-ELAP,WADOE,NELAP
trans-Chlordane (beta-Chlordane)	DoD-ELAP,WADOE,NELAP
trans-Chlordane (beta-Chlordane) [2C]	DoD-ELAP,WADOE,NELAP
cis-Chlordane (alpha-chlordane)	DoD-ELAP,WADOE,NELAP
cis-Chlordane (alpha-chlordane) [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan I	DoD-ELAP,WADOE,NELAP
Endosulfan I [2C]	DoD-ELAP,WADOE,NELAP
4,4'-DDE	DoD-ELAP,WADOE,NELAP
4,4'-DDE [2C]	DoD-ELAP,WADOE,NELAP
Dieldrin	DoD-ELAP,WADOE,NELAP
Dieldrin [2C]	DoD-ELAP,WADOE,NELAP
Endrin	DoD-ELAP,WADOE,NELAP
Endrin [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan II	DoD-ELAP,WADOE,NELAP
Endosulfan II [2C]	DoD-ELAP,WADOE,NELAP
4,4'-DDD	DoD-ELAP,WADOE,NELAP
4,4'-DDD [2C]	DoD-ELAP,WADOE,NELAP
Endrin Aldehyde	DoD-ELAP,WADOE,NELAP
Endrin Aldehyde [2C]	DoD-ELAP,WADOE,NELAP
4,4'-DDT	DoD-ELAP,WADOE,NELAP
4,4'-DDT [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan Sulfate	DoD-ELAP,WADOE,NELAP

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
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Endosulfan Sulfate [2C]	DoD-ELAP,WADOE,NELAP
Endrin Ketone	DoD-ELAP,WADOE,NELAP
Endrin Ketone [2C]	DoD-ELAP,WADOE,NELAP
Methoxychlor	DoD-ELAP,WADOE,NELAP
Methoxychlor [2C]	DoD-ELAP,WADOE,NELAP
Hexachlorobutadiene	DoD-ELAP,WADOE,NELAP
Hexachlorobutadiene [2C]	DoD-ELAP,WADOE,NELAP
Hexachlorobenzene	DoD-ELAP,WADOE,NELAP
Hexachlorobenzene [2C]	DoD-ELAP,WADOE,NELAP
2,4'-DDE	DoD-ELAP
2,4'-DDE [2C]	DoD-ELAP
2,4'-DDD	DoD-ELAP
2,4'-DDD [2C]	DoD-ELAP
2,4'-DDT	DoD-ELAP
2,4'-DDT [2C]	DoD-ELAP
Oxychlordane	DoD-ELAP
Oxychlordane [2C]	DoD-ELAP
cis-Nonachlor	DoD-ELAP
cis-Nonachlor [2C]	DoD-ELAP
trans-Nonachlor	DoD-ELAP
trans-Nonachlor [2C]	DoD-ELAP
Mirex	DoD-ELAP
Mirex [2C]	DoD-ELAP
Toxaphene	DoD-ELAP
Toxaphene [2C]	DoD-ELAP
Chlordane, technical	DoD-ELAP
Chlordane, technical [2C]	DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: 0774006.040.047 (2Q Sampling)	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	21-Jun-2022 13:53

Notes and Definitions

*	Flagged value is not within established control limits.
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
Y1	Raised reporting limit due to interference
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.