Technical Memorandum

TO:	Matthew Morris, PE, Washington State Department of Ecology
CC:	Amy Sikora, Washington State Department of Natural Resources
FROM:	Sierra Mott and Eric Weber, LHG, CWRE
DATE:	April 18, 2019
RE:	**Third Quarter Groundwater Monitoring Results** **Webster Nursery Site, Site ID 3380** **Tumwater, Washington** **Project No. 0774006.040.045**

Introduction

This technical memorandum summarizes the results of quarterly groundwater monitoring completed by Landau Associates, Inc. (LAI) at the Washington State Department of Natural Resources (DNR) Webster Nursery, 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 technical chlordane.

Remedial action excavation and disposal of HE-contaminated soil were completed in August 2018. The February 2019 groundwater monitoring event is the third of four quarterly events required for remedial action. A summary of the remedial action is provided in a draft Cleanup Action Completion Report (CACR; LAI 2018a).

Groundwater Monitoring Summary

Third quarter (3Q) groundwater monitoring was completed on February 27, 2019. Groundwater monitoring wells SW-9R, SW-10R, SW-11R, SW-14, SW-15, and SW-16 were sampled in accordance with the framework established by Washington State Department of Ecology (Ecology) Agreed Order No. DE 00TCP-SR295, the Remedial Action Work Plan (RAWP; LAI 2017), and the CACR (LAI 2018a). The scope of groundwater monitoring is described below:

- Groundwater samples were collected from three new wells (SW-9R, SW-10R, and SW-11R) and from three existing wells (SW-14, SW-15, and SW-16). Analytical Resources, Inc. of Tukwila, Washington analyzed primary groundwater samples for organochlorine pesticides using U.S. Environmental Protection Agency Method 8081A low-level.
- Depth-to-groundwater measurements were collected at three additional wells (SW-1, SW-12, and SW-13) to support analysis of groundwater level contours and flow direction.
- Per the RAWP and CACR, four quarterly groundwater monitoring events will be completed as described above. Fourth quarter (4Q) sampling will be conducted in May 2019. The 4Q memorandum will include recommendations for additional groundwater monitoring.

All groundwater samples were collected with a peristaltic pump and dedicated tubing using low-flow groundwater sampling techniques. Low-flow groundwater monitoring consists of measuring the depth-to-water with an electronic groundwater level indicator, monitoring field parameters with a YSI 554 multi-parameter probe, and measuring turbidity with a handheld meter. One duplicate sample (SW-99 at SW-11R) was collected for quality control purposes.

During 3Q groundwater monitoring, a field-filter split sample was collected at SW-10R to determine whether HE presents as a dissolved solute or is adsorbed to particulate matter. The field-filter split sample was collected in the same manner as the duplicate sample, using a disposable, 0.45-micron inline filter.

As noted above, three wells (SW-1, SW-12, and SW-13) were measured for depth-to-water. Groundwater elevation data were used to determine groundwater flow direction; further discussion is provided in the next section. The groundwater monitoring network is shown on Figure 2.

Groundwater Monitoring Results

Groundwater monitoring results are summarized below:

- At three (SW-9R, SW-14, and SW-16) of the six wells, no organochlorine pesticides were detected at concentrations greater than the laboratory reporting limits. No analytes other than HE were detected in any well during 3Q groundwater monitoring.
- HE was detected in SW-11R at a concentration of 0.0044 micrograms per liter (µg/L). This concentration is below the current cleanup level (CUL).
- In an unfiltered sample collected from SW-10R, HE was detected at a concentration of 0.0271 µg/L. This concentration is above the current CUL, but below the adjusted groundwater screening level.[1] HE was not detected above the laboratory reporting limit in the filtered sample. This result supports the understanding of HE fate and transport properties (LAI 2018b) with a low solubility and high tendency to adsorb to the aquifer matrix, making it relatively immobile in groundwater.
- HE was detected in SW-15 at a concentration of 0.0012 µg/L. This concentration is below the CUL. HE has not been detected in this well in at least the past five monitoring events[2] (beginning in 2014).

February 2019 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-10(R) and SW-11(R) (dating back to January 2010) are presented on Figure 3.

[1] Based on the federal maximum contaminant level (0.2 µg/L), the adjusted groundwater screening level is 0.048 µg/L, or a one-order-of-magnitude increase from the MTCA Method B CUL.

[2] LAI began monitoring site groundwater in 2014. Five monitoring events have occurred since, and HE reporting limits at SW-15 are as follows: 0.0097 µg/L, 0.012 µg/L, 0.000313 µg/L, 0.0006 µg/L, and 0.0006 µg/L. Reporting limits are provided in chronological order.

Groundwater elevations in February 2019 ranged from 186.61 to 187.93 feet. Since second quarter groundwater monitoring (November 2018), site groundwater elevations have increased by approximately 5 feet (LAI 2019). Regionally, groundwater flow is likely to the south, toward Salmon Creek. Locally, groundwater flow elevation is more variable, and is likely influenced by factors, including runoff, infiltration, and buried utilities. Depth-to-water and groundwater elevation data are provided in Table 2. Groundwater elevation contours are shown on Figure 2.

Environmental Information Management Submittal

An Environmental Information Management submittal is required. The submittal will be completed in spring 2019, after this technical memorandum has been submitted to Ecology.

LANDAU ASSOCIATES, INC.

Sierra Mott
Senior Project Scientist

Eric Weber, LHG, CWRE
Principal

SMM/EFW/mcs
[U:\774\006\R\QUARTERLY GW MONITORING REPORTS\3Q_FEB 19\WEBSTER NURSERY 3Q GW MONITORING TECHNICAL MEMORANDUM.DOCX]

Attachments: Figure 1. Vicinity Map
Figure 2. Monitoring Well Network and February 2019 Groundwater Elevation Contours
Figure 3. Heptachlor Epoxide Time Series Concentrations for SW-10(R) and SW-11(R)
Table 1. Groundwater Analytical Results
Table 2. Groundwater Level Measurements
Attachment 1. February 2019 Laboratory Data Package

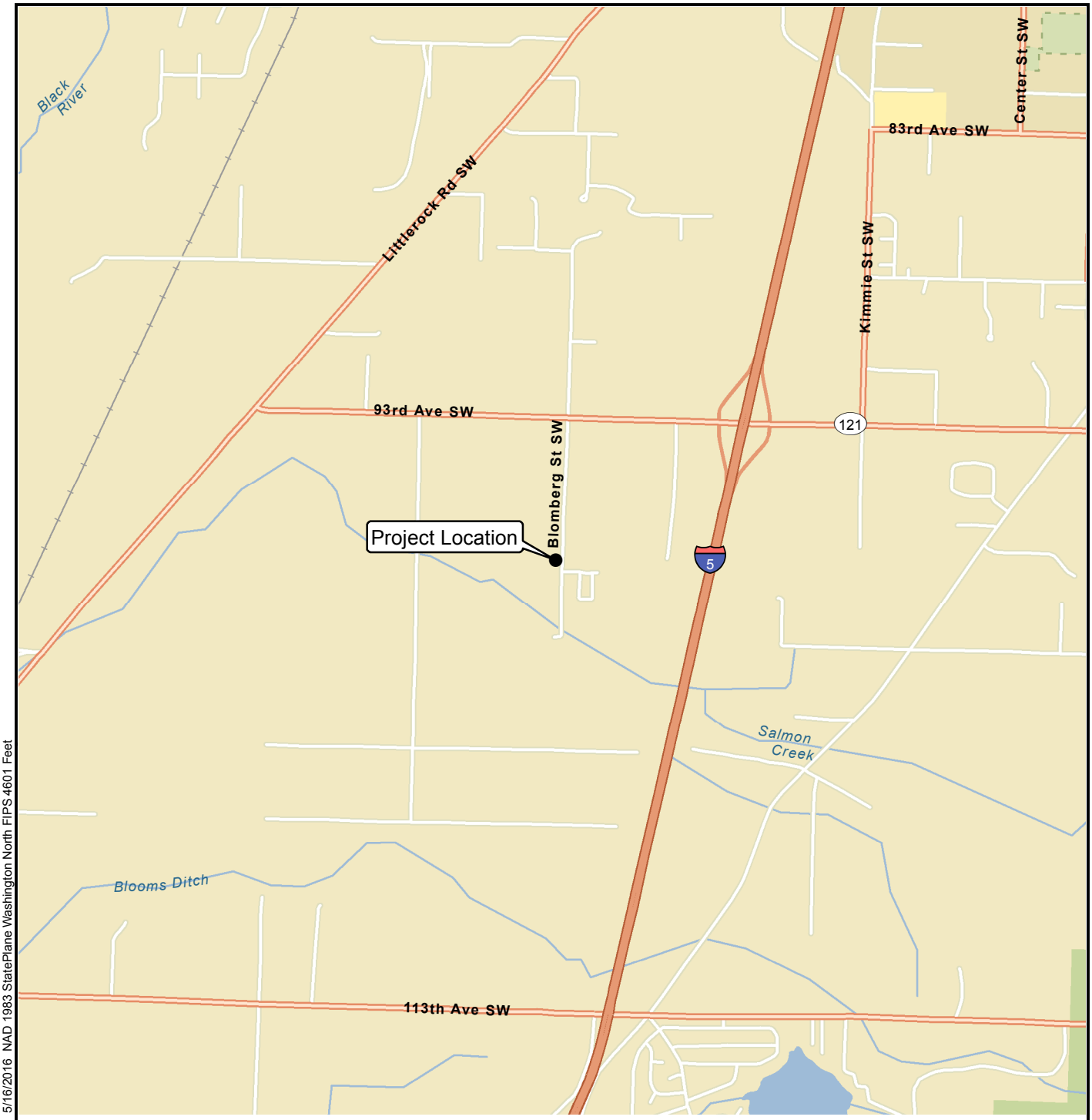
References

LAI. 2019. Technical Memorandum: Second Quarter Groundwater Monitoring Results, Webster Nursery Site, Site ID 3380, Tumwater, Washington. Landau Associates, Inc. February 21.

LAI. 2018a. Draft Cleanup Action Completion Report, Washington State Department of Natural Resources Webster Nursery, Tumwater, Washington. Landau Associates, Inc. October 12.

LAI. 2018b. Agency Review Draft Cleanup Action Completion Report, Washington State Department of Natural Resources, Webster Nursery, Tumwater, Washington. Landau Associates, Inc. October 24.

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



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

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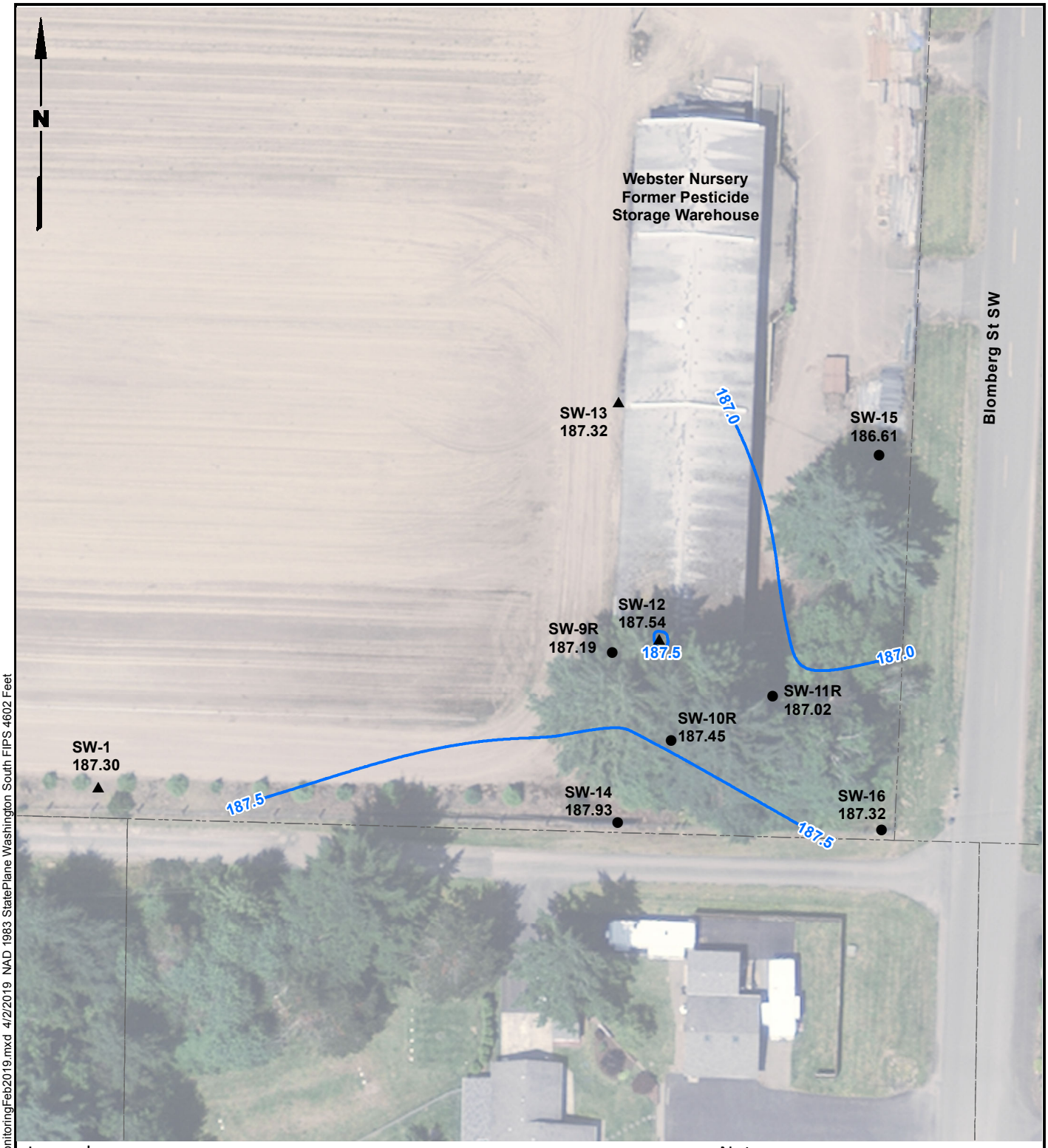
Webster Nursery Site Tumwater, Washington	**Vicinity Map**	Figure 1



Legend

- Pesticide Monitoring Well
- Other Monitoring Well
- Tax Parcels
- Groundwater Contour

0 50 100

Scale in Feet

Notes

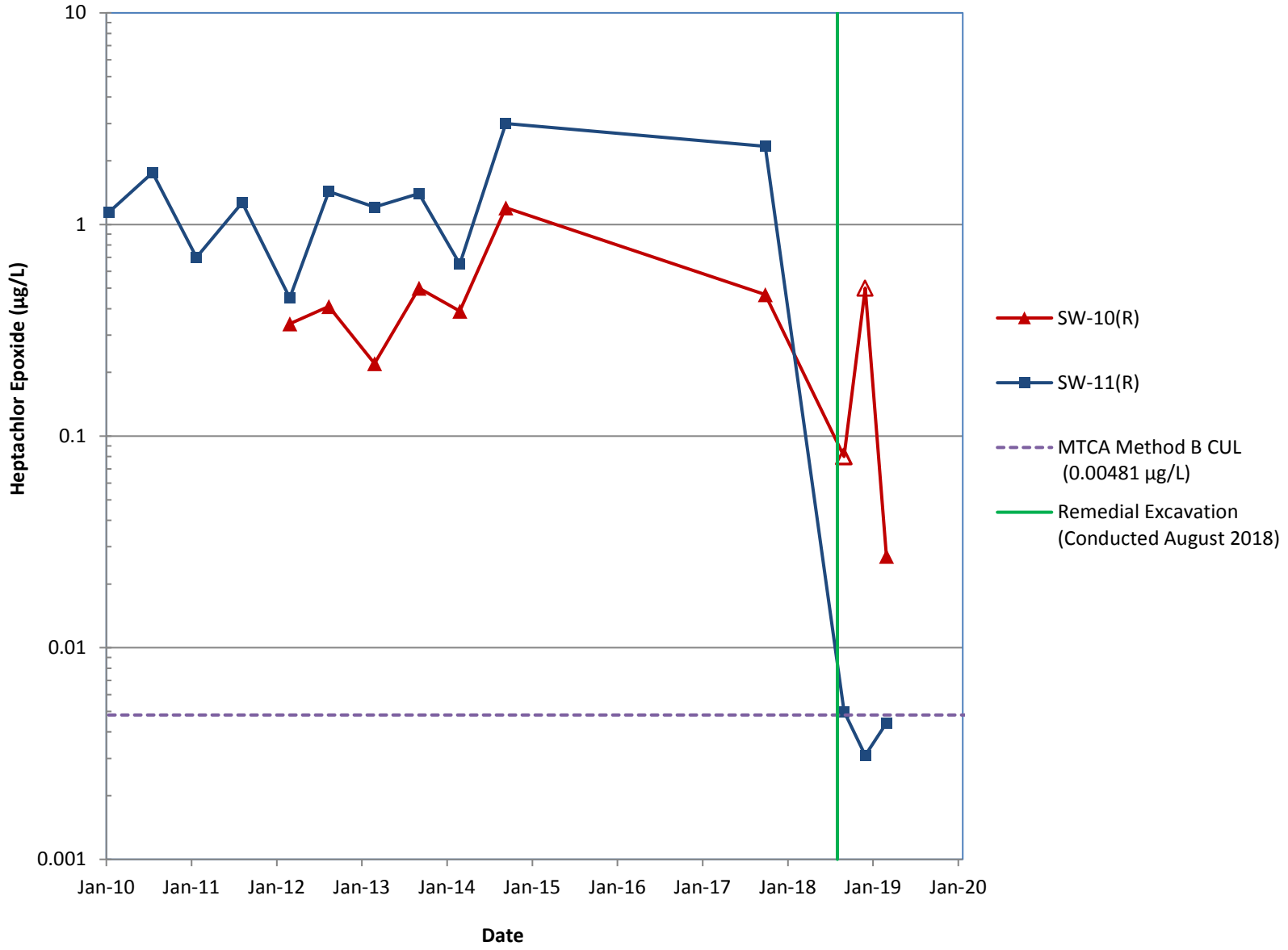
1. SW-9R, SW-10R, and SW-11R are new (replacement) wells.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Thurston County GIS; WA DNR Survey 2018

G:\Projects\774\006\040\042\F02GWMonitoringFeb2019.mxd 4/2/2019 NAD 1983 StatePlane Washington South FIPS 4602 Feet

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Monitoring Well Network and February 2019 Groundwater Elevation Contours**	Figure 2



LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Heptachlor Epoxide Time Series Concentrations for SW-10(R) and SW-11(R)**	Figure 3

Table 1
Groundwater Analytical Results
Webster Nursery
Tumwater, Washington

Analyte	MTCA Method B Cleanup Levels		Sample Location, Sample ID, Laboratory SDG, Sample Date, and Sample Type							
			SW-9R SW-9R-20190227 19C0007 2/27/2019	SW-10R SW-10R-F-20190227 19C0007 2/27/2019	SW-10R SW-10R-UF-20190227 19C0007 2/27/2019	SW-11R SW-11R-20190227 19C0007 2/27/2019	SW-11R SW-99-20190227 19C0007 2/27/2019	SW-14 SW-14-20190227 19C0007 2/27/2019	SW-15 SW-15-20190227 19C0007 2/27/2019	SW-16 SW-16-20190227 19C0007 2/27/2019
	Non-cancerous	Cancerous	N	FD	N	N	FD	N	N	N
Pesticides (µg/L; SW-846 8081B)										
4,4'-DDD	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDE	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
4,4'-DDT	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Aldrin	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
alpha-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
beta-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Chlordane	8.0	0.25	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
cis-Chlordane	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
delta-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Dieldrin	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endosulfan I	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endosulfan Sulfate	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endrin	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endrin Aldehyde	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endrin Ketone	--	--	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
gamma-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Heptachlor	8.0	0.0194	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Heptachlor Epoxide	0.104	0.00481	0.0006 U	0.0006 U	**0.0271**	**0.0044**	**0.0042**	0.0006 U	**0.0012**	0.0006 U
Methoxychlor	--	--	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U
Toxaphene	--	--	0.0625 U	0.0625 U	0.0625 U	0.0625 U	0.0625 U	0.0625 U	0.0625 U	0.0625 U
trans-Chlordane	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	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 at least one of the cleanup levels.

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

Abbreviations:

FD = field duplicate

ID = identification

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

N = primary sample

SDG = sample delivery group

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-1	193.22	5.92	187.30
SW-9R	192.62	5.43	187.19
SW-10R	193.41	5.96	187.45
SW-11R	192.50	5.48	187.02
SW-12	192.68	5.14	187.54
SW-13	192.95	5.63	187.32
SW-14	192.87	4.94	187.93
SW-15	194.58	7.97	186.61
SW-16	194.57	7.25	187.32

Abbreviations:
bgs = below ground surface
ft = feet

ATTACHMENT 1

February 2019 Laboratory Data Package

Analytical Resources, Incorporated
Analytical Chemists and Consultants

19 March 2019

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

RE: Webster Nursery

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)
19C0007	N/A

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

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

Analytical Resources, Inc.

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

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 19C0007	Turn-around Requested: Standard
ARI Client Company: Landau Associates	Phone: 253-926-2493
Client Contact: Eric Weber, Sierra Mott	
Client Project Name: Webster Nursery: quarterly groundwater sampling	
Client Project #: 7740016.040.045	Samplers: Kelsey March, Heather Rogers

Page: 1 of 1	
Date: 2/27/2019	Ice Present? Yes
No. of Coolers: 2	Cooler Temps: 5.0°C 5.3°C

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Pesticides EPA 8081B LL Organochlorine	Notes/Comments
SW-15-20190227	2/27/19	950	Aq	2	X	
SW-16-20190227	"	1040	"	"	X	
SW-14-20190227	"	1150	"	"	X	
SW-9R-20190227	"	1256	"	"	X	
SW-10R-UF-20190227	"	1356	"	"	X	
SW-10R-F-20190227	"	1358	"	"	X	Field filtered w/ 0.45µm filter
SW-11R-20190227	"	1512	"	"	X	
SW-99-20190227	"	1514	"	"	X	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Kelsey Mach	Printed Name: Katie Gangluff	Printed Name:	Printed Name: Jacob Haltc
	Company: Landau Associates	Company: Landau Associates	Company:	Company: ALI
	Date & Time: 2/27/2019	Date & Time: 2/28/2019 12:58	Date & Time:	Date & Time: 02/28/19 1258

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

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

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-15-20190227	19C0007-01	Water	27-Feb-2019 09:50	28-Feb-2019 12:58
SW-16-20190227	19C0007-02	Water	27-Feb-2019 10:40	28-Feb-2019 12:58
SW-14-20190227	19C0007-03	Water	27-Feb-2019 11:50	28-Feb-2019 12:58
SW-9R-20190227	19C0007-04	Water	27-Feb-2019 12:56	28-Feb-2019 12:58
SW-10R-UF-20190227	19C0007-05	Water	27-Feb-2019 13:56	28-Feb-2019 12:58
SW-10R-F-20190227	19C0007-06	Water	27-Feb-2019 13:58	28-Feb-2019 12:58
SW-11R-20190227	19C0007-07	Water	27-Feb-2019 15:12	28-Feb-2019 12:58
SW-99-20190227	19C0007-08	Water	27-Feb-2019 15:14	28-Feb-2019 12:58

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

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

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 LCS percent recoveries were within control limits.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Landau Tacoma Project Name: Webster Nursery

COC No(s): NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other:

Assigned ARI Job No: 19C0007 Tracking No: NA

Preliminary Examination Phase:

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

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

Time 1354 5.0°C 5.3°

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D005206

Cooler Accepted by: JM Date: 02/28/19 Time: 1258

Complete custody forms and attach all shipping documents

Log-In Phase:

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

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

Samples Logged by: Sef Date: 3-1-19 Time: 10 Labels checked by: Sef

***** 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: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-15-20190227

19C0007-01 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 09:50

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 15:09

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-01 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-01 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-01 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	**0.0012**	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 %*	*71.9*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*77.1*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*95.8*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*74.1*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-16-20190227

19C0007-02 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 10:40

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 15:27

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-02 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-02 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-02 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	ND	ug/L	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 %*	*91.7*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*101*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*102*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*74.3*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-14-20190227

19C0007-03 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 11:50

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 15:45

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-03 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-03 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-03 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	ND	ug/L	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 %*	*90.4*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*99.2*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*96.4*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*72.9*	*%*	

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-9R-20190227

19C0007-04 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 12:56

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 16:03

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-04 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-04 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-04 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	ND	ug/L	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 %*	*93.8*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*105*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*83.9*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*82.4*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-10R-UF-20190227

19C0007-05 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 13:56

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 16:21

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-05 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-05 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-05 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	**0.0271**	ug/L	P1
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 %*	*92.0*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*98.8*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*74.3*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*67.8*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-10R-F-20190227

19C0007-06 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 13:58

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 16:39

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-06 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-06 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-06 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	ND	ug/L	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 %*	*92.8*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*102*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*81.5*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*55.8*	*%*	

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-11R-20190227

19C0007-07 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 15:12

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 16:57

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-07 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-07 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-07 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	**0.0044**	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 %*	*87.2*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*92.8*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*67.0*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*65.4*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

SW-99-20190227

19C0007-08 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 02/27/2019 15:14

Instrument: ECD6 Analyst: YZ — Analyzed: 03/18/2019 17:15

Sample Preparation:	Preparation Method: EPA 3510C SepF		Extract ID: 19C0007-08 A 01
	Preparation Batch: BHC0069	Sample Size: 1000 mL	
	Prepared: 05-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Silica Gel		Extract ID: 19C0007-08 A 01
	Cleanup Batch: CHC0101	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	
Sample Cleanup:	Cleanup Method: Sulfur		Extract ID:19C0007-08 A 01
	Cleanup Batch: CHC0100	Initial Volume: 0.5 mL	
	Cleaned: 15-Mar-2019	Final Volume: 0.5 mL	

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	**0.0042**	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 %*	*93.5*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*101*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*72.9*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*67.9*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

Chlorinated Pesticides - Quality Control

Batch BHC0069 - 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 (BHC0069-BLK1)				Prepared: 05-Mar-2019 Analyzed: 18-Mar-2019 14:14						
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	0.0178		ug/L	*0.0200*		*89.2*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0194		ug/L	*0.0200*		*97.1*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0142		ug/L	*0.0200*		*70.8*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0161		ug/L	*0.0200*		*80.3*	*30-160*			
LCS (BHC0069-BS1)				Prepared: 05-Mar-2019 Analyzed: 18-Mar-2019 14:32						
alpha-BHC	0.0080	0.0006	ug/L	0.0100		80.1	30-160			
beta-BHC	0.0083	0.0006	ug/L	0.0100		83.2	30-160			
gamma-BHC (Lindane)	0.0082	0.0006	ug/L	0.0100		82.1	30-160			
delta-BHC	0.0087	0.0006	ug/L	0.0100		87.4	30-160			
Heptachlor	0.0077	0.0006	ug/L	0.0100		77.2	30-160			
Aldrin	0.0086	0.0006	ug/L	0.0100		86.2	30-160			
Heptachlor Epoxide	0.0091	0.0006	ug/L	0.0100		90.9	30-160			

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

Chlorinated Pesticides - Quality Control

Batch BHC0069 - 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 (BHC0069-BS1)				Prepared: 05-Mar-2019 Analyzed: 18-Mar-2019 14:32						
trans-Chlordane (beta-Chlordane)	0.0103	0.0006	ug/L	0.0100		103	30-160			
cis-Chlordane (alpha-chlordane)	0.0090	0.0006	ug/L	0.0100		90.4	30-160			
Endosulfan I	0.0092	0.0006	ug/L	0.0100		92.2	30-160			
4,4'-DDE	0.0206	0.0013	ug/L	0.0200		103	30-160			
Dieldrin	0.0192	0.0013	ug/L	0.0200		95.9	30-160			
Endrin	0.0177	0.0013	ug/L	0.0200		88.4	30-160			
Endosulfan II	0.0167	0.0013	ug/L	0.0200		83.6	30-160			
4,4'-DDD	0.0173	0.0013	ug/L	0.0200		86.5	30-160			
Endrin Aldehyde	0.0115	0.0013	ug/L	0.0200		57.7	30-160			
4,4'-DDT	0.0178	0.0013	ug/L	0.0200		89.1	30-160			
Endosulfan Sulfate	0.0172	0.0013	ug/L	0.0200		86.1	30-160			
Endrin Ketone	0.0167	0.0013	ug/L	0.0200		83.6	30-160			
Methoxychlor	0.0865	0.0063	ug/L	0.100		86.5	30-160			
Surrogate: Decachlorobiphenyl	0.0197		ug/L	*0.0200*		*98.4*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0220		ug/L	*0.0200*		*110*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0156		ug/L	*0.0200*		*77.9*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0159		ug/L	*0.0200*		*79.4*	*30-160*			
LCS Dup (BHC0069-BSD1)				Prepared: 05-Mar-2019 Analyzed: 18-Mar-2019 14:51						
alpha-BHC	0.0081	0.0006	ug/L	0.0100		80.7	30-160	0.74	30	
beta-BHC	0.0085	0.0006	ug/L	0.0100		84.7	30-160	1.82	30	
gamma-BHC (Lindane)	0.0084	0.0006	ug/L	0.0100		84.4	30-160	2.76	30	
delta-BHC	0.0092	0.0006	ug/L	0.0100		92.1	30-160	5.17	30	
Heptachlor	0.0082	0.0006	ug/L	0.0100		82.3	30-160	6.36	30	
Aldrin	0.0088	0.0006	ug/L	0.0100		88.2	30-160	2.33	30	
Heptachlor Epoxide	0.0094	0.0006	ug/L	0.0100		94.0	30-160	3.32	30	
trans-Chlordane (beta-Chlordane)	0.0107	0.0006	ug/L	0.0100		107	30-160	3.62	30	
cis-Chlordane (alpha-chlordane)	0.0095	0.0006	ug/L	0.0100		95.3	30-160	5.25	30	
Endosulfan I	0.0095	0.0006	ug/L	0.0100		95.1	30-160	3.04	30	
4,4'-DDE	0.0216	0.0013	ug/L	0.0200		108	30-160	5.03	30	
Dieldrin	0.0198	0.0013	ug/L	0.0200		99.2	30-160	3.35	30	
Endrin	0.0190	0.0013	ug/L	0.0200		94.9	30-160	7.16	30	
Endosulfan II	0.0174	0.0013	ug/L	0.0200		86.8	30-160	3.66	30	
4,4'-DDD	0.0180	0.0013	ug/L	0.0200		90.2	30-160	4.21	30	
Endrin Aldehyde	0.0109	0.0013	ug/L	0.0200		54.4	30-160	5.76	30	

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2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	19-Mar-2019 17:00

Chlorinated Pesticides - Quality Control

Batch BHC0069 - 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 (BHC0069-BSD1)				Prepared: 05-Mar-2019 Analyzed: 18-Mar-2019 14:51						
4,4'-DDT	0.0184	0.0013	ug/L	0.0200		92.1	30-160	3.35	30	
Endosulfan Sulfate	0.0182	0.0013	ug/L	0.0200		91.0	30-160	5.53	30	
Endrin Ketone	0.0170	0.0013	ug/L	0.0200		84.8	30-160	1.37	30	
Methoxychlor	0.0897	0.0063	ug/L	0.100		89.7	30-160	3.60	30	
Surrogate: Decachlorobiphenyl	0.0196		ug/L	*0.0200*		*97.9*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0218		ug/L	*0.0200*		*109*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.0150		ug/L	*0.0200*		*75.2*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.0150		ug/L	*0.0200*		*74.9*	*30-160*			

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Certified Analyses included in this Report

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

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Endosulfan Sulfate [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endrin Ketone	WADOE,DoD-ELAP,NELAP,CALAP
Endrin Ketone [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Methoxychlor	WADOE,DoD-ELAP,NELAP,CALAP
Methoxychlor [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobutadiene	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobutadiene [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobenzene	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobenzene [2C]	WADOE,DoD-ELAP,NELAP,CALAP
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	01/31/2021
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Notes and Definitions

E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
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).
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.