

# Technical Memorandum

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**TO:** Matthew Morris, PE, Washington State Department of Ecology  
**CC:** John Felder, PE, Washington State Department of Natural Resources  
**FROM:** Sierra Mott and Eric Weber, LHG, CWRE  
**DATE:** February 21, 2019  
**RE:** **Second Quarter Groundwater Monitoring Results  
Webster Nursery Site, Site ID 3380  
Tumwater, Washington  
LAI Project No. 0774006.040.045**

## Introduction

On behalf of the Washington State Department of Natural Resources (DNR), Landau Associates, Inc. (LAI) is providing the November 2018 groundwater monitoring results for DNR's Webster Nursery former pesticide storage warehouse (site). The site is associated with past releases of organochlorine pesticides to soil and groundwater. The constituents of concern at the site include the organochlorine pesticides heptachlor epoxide (HE; breakdown product of heptachlor) and technical chlordane. The site location is shown on Figure 1.

Remedial action excavation and disposal of soil contaminated with HE was completed on August 2018. This is the second of four required quarterly monitoring events related to the remedial action. Results of the excavation are provided in a draft Cleanup Action Completion Report (CACR; LAI 2018a).

## Groundwater Monitoring Summary

Groundwater monitoring was completed by LAI on November 28, 2018. The six groundwater monitoring wells sampled were SW-9R, SW-10R, SW-11R, SW-14, SW-15, and SW-16. The groundwater monitoring framework was established under an Agreed Order (No. DE 00TCP-SR295) dated January 8, 2001) with the Washington State Department of Ecology (Ecology) and in accordance with the Remedial Action Work Plan (RAWP; LAI 2017) and CACR (LAI 2018a). The scope of groundwater monitoring is described below:

- Groundwater samples were collected for analysis at three new replacement wells (SW-9R, SW-10R, and SW-11R) and three existing wells (SW-14, SW-15, and SW-16). All primary groundwater samples were analyzed for organochlorine pesticides using US Environmental Protection Agency Method 8081A low-level at Analytical Resources, Inc. (ARI) located in Tukwila, Washington. A laboratory split sample (described below) was collected from SW-10R and analyzed for the method listed above by ALS Laboratories (ALS) located in Kelso, Washington.
- Depth to groundwater measurements were also 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 consecutive quarters of groundwater sampling will be conducted as described above. Third quarter (3Q) and 4Q sampling will be conducted in February and May 2019, respectively.

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 using 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.

Due to matrix interference, the reporting limit for HE at SW-10R was elevated during the 1Q monitoring event (LAI 2018b), completed in August 2018. The elevated reporting limit for HE was 0.080 micrograms per liter ( $\mu\text{g/L}$ ) and the cleanup level (CUL) is 0.00481  $\mu\text{g/L}$ . To determine whether laboratory-specific procedures resulted in the elevated reporting limit, a laboratory split sample was collected and analyzed by ALS. The laboratory split sample was collected in the same manner as the duplicate sample.

As mentioned above, an additional 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:

- No organochlorine pesticides were detected at concentrations greater than the laboratory-reporting limits at four (SW-9R, SW-14, SW-15, and SW-16) of the six wells.
- HE was detected at a concentration of 0.0031  $\mu\text{g/L}$  at SW-11R (below the CUL).
- The reporting limit for HE was elevated above the CUL<sup>1</sup> at SW-10R in the sample analyzed by ARI (not detected at a concentration of 0.500  $\mu\text{g/L}$ ). The ALS results indicate that HE was detected at a concentration of 0.570  $\mu\text{g/L}$ , which does exceed the CUL.
- Cis-chlordane and trans-chlordane were also detected at SW-10R in the ALS split-sample, at a concentration of 0.016 and 0.080  $\mu\text{g/L}$ , respectively<sup>2</sup>. Technical chlordane at that well was not detected above the laboratory reporting limit (0.005  $\mu\text{g/L}$ ).

November 2018 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 (dating back to January 2010) are presented on Figure 3. For consistency, we are plotting the ARI data on this figure as opposed to the split sample from ALS.

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<sup>1</sup> HE, trans-chlordane and cis-chlordane have an elevated reporting limit due to matrix effects in the sample.

<sup>2</sup> The results for cis-chlordane and trans-chlordane were qualified at J+, or as an estimated quantity and potentially biased high.

Groundwater elevations in November 2018 were similar to previous elevations measured in August 2018, and ranged between 181.50 ft and 182.35 feet. 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 possibly buried utilities. Depth to water and groundwater elevations data are provided in Table 2. Groundwater elevation contours are shown on Figure 2.

## Environmental Information Management Submittal

An Environmental Information Management (EIM) submittal is required. This submittal will be completed in winter 2019, after submission of this technical memorandum to Ecology.

LANDAU ASSOCIATES, INC.



Sierra Mott  
Senior Project Scientist



Eric Weber, LHG, CWRE  
Principal

SMM/EFW/jrc

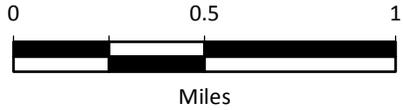
Y:\774\006\R\Quarterly GW Monitoring Reports\2Q\_Nov 18\LAI\_Webster Nursery 2Q GW Monitoring\_draft TM 02052019.docx

## References

- LAI. 2017. Remedial Action Work Plan, Webster Nursery, 9805 Blomberg Street SW, Tumwater, Washington. Landau Associates, Inc. October 31.
- 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 Technical Memorandum: First Quarter Groundwater Monitoring Results, Webster Nursery Site, Site ID 3380, Tumwater, Washington. Landau Associates, Inc. October 24.

Attachments: Figure 1: Vicinity Map  
Figure 2: Monitoring Well Network and August 2018 Groundwater Elevation Contours  
Figure 3: Heptachlor Epoxide Time Series Concentrations for SW-10 and SW-11  
Table 1: Groundwater Analytical Results  
Table 2: Groundwater Level Measurements  
Attachment 1: November 2018 Laboratory Data Package

G:\Projects\774\006\020\026\FIS\F01\_VicinityMap.mxd 5/16/2016 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Data Source: Esri 2012

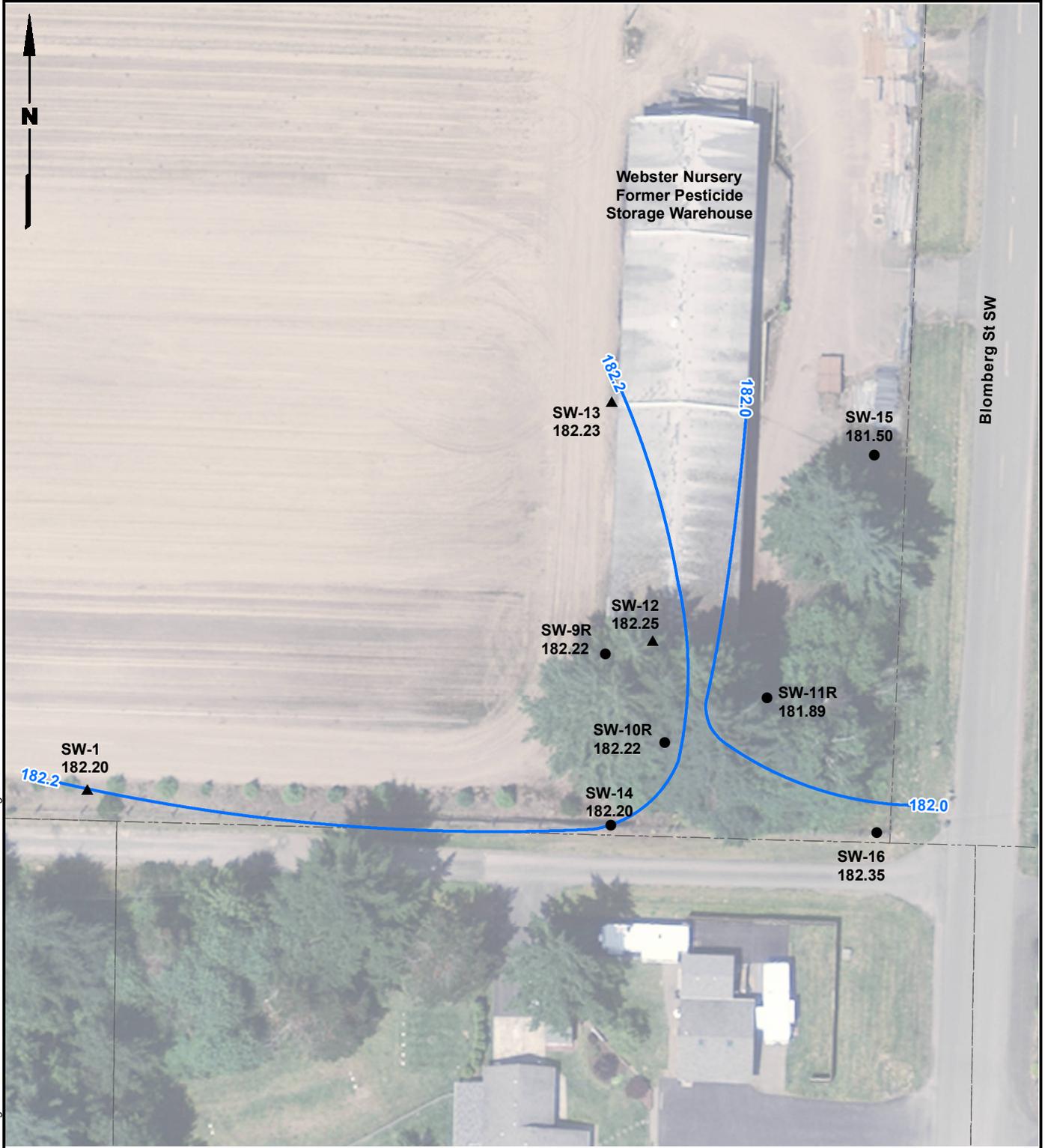


Webster Nursery Site  
Tumwater, Washington

Vicinity Map

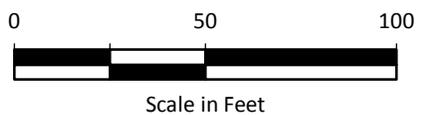
Figure  
**1**

G:\Projects\7741006\040\045\F02GWMonitoringNov2018.mxd 12/28/2018 NAD 1983 StatePlane Washington South FIPS 4602 Feet



**Legend**

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



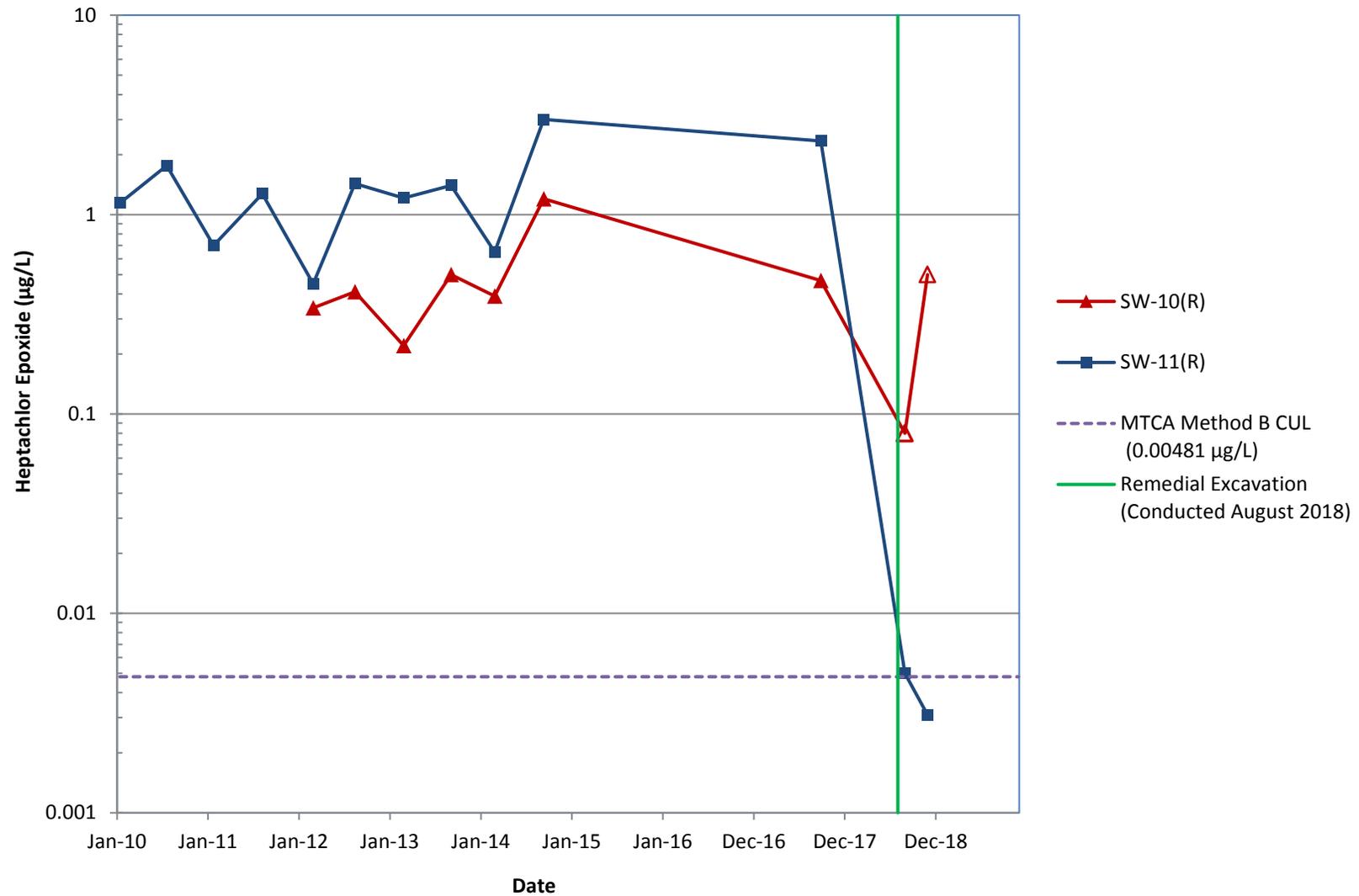
**Notes**

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.



Webster Nursery Site Tumwater, Washington	<b>Monitoring Well Network and November 2018 Groundwater Elevation Contours</b>	Figure <b>2</b>
----------------------------------------------	-----------------------------------------------------------------------------------------	--------------------



1. Open markers on graph denote non-detect values. Values shown represent the analytical reporting limit.
2. Data after the remedial action excavation in 2018 are from replacement wells.

**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-20181128 18K0402 11/28/2018	SW-10R SW-10R-20181128 18K0402 11/28/2018	SW-10R (a) SW-10R-20181128 K1811642 11/28/2018	SW-11R SW-11R-20181128 18K0402 11/28/2018	SW-11R SW-99-20181128 18K0402 11/28/2018	SW-14 SW-14-20181128 18K0402 11/28/2018	SW-15 SW-15-20181128 18K0402 11/28/2018	SW-16 SW-16-20181128 18K0402 11/28/2018
	Non-cancerous	Cancerous	N	N	N	N	FD	N	N	N
<b>Pesticides (µg/L; SW-846 8081B)</b>										
4,4'-DDD	--	--	0.0013 U	0.0013 U	0.001 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	0.0016 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	0.001 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Aldrin	--	--	0.0006 U	0.0006 U	0.001 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
alpha-BHC	--	--	0.0006 U	0.0006 U	0.001 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
beta-BHC	--	--	0.0006 U	0.0006 U	0.0016 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	0.18 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U
cis-Chlordane	--	--	0.0006 U	0.200 U	<b>0.016 J+</b>	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
delta-BHC	--	--	0.0006 U	0.0006 U	0.0033 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Dieldrin	--	--	0.0013 U	0.0013 U	0.0022 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endosulfan I	--	--	0.0006 U	0.0006 U	0.001 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II	--	--	0.0013 U	0.0013 U	0.001 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endosulfan Sulfate	--	--	0.0013 U	0.0013 U	0.001 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endrin	--	--	0.0013 U	0.0013 U	0.001 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endrin Aldehyde	--	--	0.0013 U	0.0013 U	0.001 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
Endrin Ketone	--	--	0.0013 U	0.0013 U	0.0014 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U	0.0013 U
gamma-BHC	--	--	0.0006 U	0.0006 U	0.001 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	0.001 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	0.500 U	<b>0.570</b>	<b>0.0031 J</b>	<b>0.0021 J</b>	0.0006 U	0.0006 U	0.0006 U
Methoxychlor	--	--	0.0063 U	0.0063 U	0.002 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U	0.0063 U
Toxaphene	--	--	0.0625 U	0.0625 U	0.100 U	0.0625 U	0.0625 U	0.0625 U	0.0625 U	0.0625 U
trans-Chlordane	--	--	0.0006 U	0.500 U	<b>0.080 J+</b>	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U

**Notes:**

- (a) A split sample was collected at SW-10R and was analyzed at ALS Laboratories in Kelso, WA.
- = 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.
- J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ = The result is an estimated quantity and the result may be biased high.

**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	11.02	182.20
SW-9R	192.62	10.40	182.22
SW-10R	193.41	11.19	182.22
SW-11R	192.50	10.61	181.89
SW-12	192.68	10.43	182.25
SW-13	192.95	10.72	182.23
SW-14	192.87	10.67	182.20
SW-15	194.58	13.08	181.50
SW-16	194.57	12.22	182.35

**Abbreviations:**

bgs = below ground surface  
ft = feet

# **November 2018 Laboratory Data Packages**



11 December 2018

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.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
18K0402	N/A

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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.*



# Chain of Custody Record & Laboratory Analysis Request



**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

ARI Assigned Number: <b>18K0402</b>	Turn-around Requested: <b>Standard</b>	Page: <b>i</b> of <b>1</b>
ARI Client Company: <b>Landau Associates</b>	Phone: <b>253-926-2493</b>	Date: <b>11/28/18</b> Ice Present? <b>Yes</b>
Client Contact: <b>Eric Weber, Sierra Mott</b>		No. of Coolers: <b>2</b> Cooler Temps: <b>4.8° 4.3°</b>

Client Project Name: <b>Webster Nursery: quarterly groundwater monitoring</b>	Analysis Requested	Notes/Comments
Client Project #: <b>774006040045</b>	Pesticides EPA 8061 B W Organochlorine	
Samplers: <b>Katie Gauglitz</b>		

Sample ID	Date	Time	Matrix	No. Containers										
SW-15-20181128	11/28/18	9 10	Aq	2	<del>X</del>									
SW-16-20181128		10 10			<del>X</del>									
SW-14-20181128		10 55			<del>X</del>									
SW-9R-20181128		11 35			<del>X</del>									
SW-10R-20181128		12 45			<del>X</del>									
SW-11R-20181128		13 55			<del>X</del>									
SW-99-20181128		14 00			<del>X</del>									

Comments/Special Instructions	Relinquished by: (Signature) <b>Katie M. Gauglitz</b>	Received by: (Signature) <b>Jacob Walter</b>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: <b>Katie Gauglitz</b>	Printed Name: <b>Jacob Walter</b>	Printed Name:	Printed Name:
	Company: <b>Landau Associates</b>	Company: <b>ARI</b>	Company:	Company:
	Date & Time: <b>11/28/18 16:00</b>	Date & Time: <b>11/28/18 16:00</b>	Date & Time:	Date & Time:

**Limits of Liability:** ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding 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  
2107 South C Street  
Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-15-20181128	18K0402-01	Water	28-Nov-2018 09:10	28-Nov-2018 16:00
SW-16-20181128	18K0402-02	Water	28-Nov-2018 10:10	28-Nov-2018 16:00
SW-14-20181128	18K0402-03	Water	28-Nov-2018 10:55	28-Nov-2018 16:00
SW-9R-20181128	18K0402-04	Water	28-Nov-2018 11:35	28-Nov-2018 16:00
SW-10R-20181128	18K0402-05	Water	28-Nov-2018 12:45	28-Nov-2018 16:00
SW-11R-20181128	18K0402-06	Water	28-Nov-2018 13:55	28-Nov-2018 16:00
SW-99-20181128	18K0402-07	Water	28-Nov-2018 14:00	28-Nov-2018 16:00



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

## Work Order Case Narrative

### Pesticides - EPA Method SW8081A

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.

The reporting limits have been raised for sample SW-10R-20181128 due to a matrix interference.



**WORK ORDER**

**18K0402**

<b>Client:</b> Landau Associates, Inc. - Tacoma	<b>Project Manager:</b> Kelly Bottem
<b>Project:</b> Webster Nursery	<b>Project Number:</b> Webster Nursery

<b>Report To:</b> Landau Associates, Inc. - Tacoma Sara Fees 2107 South C Street Tacoma, WA 98402 Phone: (253) 926-2493 Fax: (253) 926-2531	<b>Invoice To:</b> Landau Associates, Inc. - Tacoma Sara Fees 2107 South C Street Tacoma, WA 98402 Phone : (253) 926-2493 Fax: (253) 926-2531
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Date Due: 13-Dec-2018 18:00 (10 day TAT)	Date Received: 28-Nov-2018 16:00
Received By: Jacob Walter	Date Logged In: 28-Nov-2018 17:17
Logged In By: Jacob Walter	

Samples Received at: 4.8°C	
Intact, properly signed and dated custody seals attached to outside of cooler(s).....No	Custody papers included with the cooler..... Yes
Custody papers properly filled out (in, signed, analyses requested, etc).....Yes	Was a temperature blank included in the cooler..... No
Was sufficient ice used (if appropriate).....Yes	All bottles sealed in individual plastic bags..... No
All bottles arrived in good condition (unbroken).....Yes	All bottle labels complete and legible..... Yes
Number of containers listed on COC match number received.....Yes	Bottle labels and tags agree with COC..... Yes
Correct bottles used for the requested analyses.....Yes	All VOC vials free of air bubbles..... No
Analyses/bottles require preservation (attach preservation sheet excluding VOC).No	Sufficient amount of sample sent in each bottle..... Yes
Sample split at ARI.....No	

Analysis	Due	TAT	Expires	Comments
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**WORK ORDER**

**18K0402**

**Client:** Landau Associates, Inc. - Tacoma

**Project Manager:** Kelly Bottem

**Project:** Webster Nursery

**Project Number:** Webster Nursery

Analysis	Due	TAT	Expires	Comments
<b>18K0402-01 SW-15-20181128 [Water] Sampled 28-Nov-2018 09:10 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 09:10	Must meet MTCA method B. Must not over dilute. LC
<b>18K0402-02 SW-16-20181128 [Water] Sampled 28-Nov-2018 10:10 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 10:10	Must meet MTCA method B. Must not over dilute. LC
<b>18K0402-03 SW-14-20181128 [Water] Sampled 28-Nov-2018 10:55 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 10:55	Must meet MTCA method B. Must not over dilute. LC
<b>18K0402-04 SW-9R-20181128 [Water] Sampled 28-Nov-2018 11:35 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 11:35	Must meet MTCA method B. Must not over dilute. LC
<b>18K0402-05 SW-10R-20181128 [Water] Sampled 28-Nov-2018 12:45 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 12:45	Must meet MTCA method B. Must not over dilute. LC
<b>18K0402-06 SW-11R-20181128 [Water] Sampled 28-Nov-2018 13:55 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 13:55	Must meet MTCA method B. Must not over dilute. LC
<b>18K0402-07 SW-99-20181128 [Water] Sampled 28-Nov-2018 14:00 (GMT-08:00) Pacific Time (US &amp; Canada)</b>				
<i>A = Glass NM, Amber, 1000 mL      B = Glass NM, Amber, 1000 mL</i>				
8081B Pest (Low Level H2O)	13-Dec-2018 15:00	10	05-Dec-2018 14:00	Must meet MTCA method B. Must not over dilute. LC

Reviewed By \_\_\_\_\_

Date \_\_\_\_\_



# Cooler Receipt Form

ARI Client: London Associates

Project Name: Webster Nursery

COC No(s): \_\_\_\_\_ (NA)

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

Assigned ARI Job No: 18K0402

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) 4.8°C 4.3°C  
 Time: 1600

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 2005706

Cooler Accepted by: JSW Date: 11/28/18 Time: 1600

**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: JSW Date: 11/28/18 Time: 1717

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

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
<u>SW-11R-20181128</u>	<u>SW-94-20181128</u>		

**Additional Notes, Discrepancies, & Resolutions:** above marked w/ stars. 2 set of samples labeled as SW-11R-20181128, sampled time used to distinguish correct sample.

By: JSW Date: 11/28/18

<p>Small Air Bubbles ~2mm</p>	<p>Peabubbles' 2-4 mm</p>	<p>LARGE Air Bubbles &gt; 4 mm</p>	<p>Small → "sm" (&lt; 2 mm)</p> <p>Peabubbles → "pb" (2 to &lt; 4 mm)</p> <p>Large → "lg" (4 to &lt; 6 mm)</p> <p>Headspace → "hs" (&gt; 6 mm)</p>
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Landau Associates, Inc. - Tacoma  
2107 South C Street  
Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-15-20181128**  
**18K0402-01 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 09:10  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 16:39

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BGL0073 Sample Size: 1000 mL  
Prepared: 04-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CGL0035 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur  
Cleanup Batch: CGL0034 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 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
<i>Surrogate: Decachlorobiphenyl</i>				30-160 %	49.2 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				30-160 %	52.4 %	
<i>Surrogate: Tetrachlorometaxylene</i>				30-160 %	54.6 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				30-160 %	44.5 %	



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2107 South C Street  
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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-16-20181128**  
**18K0402-02 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 10:10  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 16:57

Sample Preparation: Preparation Method: EPA 3510C SepF Sample Size: 1000 mL  
Preparation Batch: BGL0073 Final Volume: 0.5 mL  
Prepared: 04-Dec-2018

Sample Cleanup: Cleanup Method: Silica Gel Initial Volume: 0.5 mL  
Cleanup Batch: CGL0035 Final Volume: 0.5 mL  
Cleaned: 06-Dec-2018

Sample Cleanup: Cleanup Method: Sulfur Initial Volume: 0.5 mL  
Cleanup Batch: CGL0034 Final Volume: 0.5 mL  
Cleaned: 06-Dec-2018

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
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	55.2	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	52.6	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	38.3	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	36.3	%	



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-14-20181128**  
**18K0402-03 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 10:55  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 17:15

Sample Preparation: Preparation Method: EPA 3510C SepF Sample Size: 1000 mL  
Preparation Batch: BGL0073 Final Volume: 0.5 mL  
Prepared: 04-Dec-2018

Sample Cleanup: Cleanup Method: Silica Gel Initial Volume: 0.5 mL  
Cleanup Batch: CGL0035 Final Volume: 0.5 mL  
Cleaned: 06-Dec-2018

Sample Cleanup: Cleanup Method: Sulfur Initial Volume: 0.5 mL  
Cleanup Batch: CGL0034 Final Volume: 0.5 mL  
Cleaned: 06-Dec-2018

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
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	62.1	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	62.1	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	48.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	50.3	%	



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2107 South C Street  
Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-9R-20181128**  
**18K0402-04 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 11:35  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 17:34

Sample Preparation: Preparation Method: EPA 3510C SepF Sample Size: 1000 mL  
Preparation Batch: BGL0073 Final Volume: 0.5 mL  
Prepared: 04-Dec-2018

Sample Cleanup: Cleanup Method: Silica Gel Initial Volume: 0.5 mL  
Cleanup Batch: CGL0035 Final Volume: 0.5 mL  
Cleaned: 06-Dec-2018

Sample Cleanup: Cleanup Method: Sulfur Initial Volume: 0.5 mL  
Cleanup Batch: CGL0034 Final Volume: 0.5 mL  
Cleaned: 06-Dec-2018

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
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	69.0	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	66.2	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	46.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	44.6	%	



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Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-10R-20181128**  
**18K0402-05 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 12:45  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 17:52

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BGL0073 Sample Size: 1000 mL  
Prepared: 04-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CGL0035 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur  
Cleanup Batch: CGL0034 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 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	0.500	ND	ug/L	Y1, U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.500	ND	ug/L	Y1, U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.200	ND	ug/L	Y1, 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
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	64.8	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	61.7	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	40.5	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	42.3	%	



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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-11R-20181128**  
**18K0402-06 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 13:55  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 18:10

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BGL0073 Sample Size: 1000 mL  
Prepared: 04-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CGL0035 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur  
Cleanup Batch: CGL0034 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 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	<b>0.0031</b>	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
<i>Surrogate: Decachlorobiphenyl</i>				30-160 %	68.0 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				30-160 %	65.9 %	
<i>Surrogate: Tetrachlorometaxylene</i>				30-160 %	46.4 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				30-160 %	47.2 %	



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Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**SW-99-20181128**  
**18K0402-07 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 11/28/2018 14:00  
Instrument: ECD6 Analyst: YZ Analyzed: 12/10/2018 18:28

Sample Preparation: Preparation Method: EPA 3510C SepF  
Preparation Batch: BGL0073 Sample Size: 1000 mL  
Prepared: 04-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel  
Cleanup Batch: CGL0035 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur  
Cleanup Batch: CGL0034 Initial Volume: 0.5 mL  
Cleaned: 06-Dec-2018 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	<b>0.0021</b>	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
<i>Surrogate: Decachlorobiphenyl</i>				30-160 %	66.9 %	
<i>Surrogate: Decachlorobiphenyl [2C]</i>				30-160 %	64.6 %	
<i>Surrogate: Tetrachlorometaxylene</i>				30-160 %	43.1 %	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>				30-160 %	44.6 %	



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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**Chlorinated Pesticides - Quality Control**

**Batch BGL0073 - 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
<b>Blank (BGL0073-BLK1)</b>										
Prepared: 04-Dec-2018 Analyzed: 10-Dec-2018 15:44										
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	0.0149		ug/L	0.0200		74.4	30-160			
Surrogate: Decachlorobiphenyl [2C]	0.0140		ug/L	0.0200		70.0	30-160			
Surrogate: Tetrachlorometaxylene	0.0107		ug/L	0.0200		53.6	30-160			
Surrogate: Tetrachlorometaxylene [2C]	0.0106		ug/L	0.0200		52.8	30-160			

<b>LCS (BGL0073-BS1)</b>										
Prepared: 04-Dec-2018 Analyzed: 10-Dec-2018 16:03										
alpha-BHC	0.0059	0.0006	ug/L	0.0100		58.9	30-160			
beta-BHC	0.0063	0.0006	ug/L	0.0100		62.8	30-160			
gamma-BHC (Lindane)	0.0060	0.0006	ug/L	0.0100		59.8	30-160			
delta-BHC	0.0066	0.0006	ug/L	0.0100		66.4	30-160			
Heptachlor	0.0057	0.0006	ug/L	0.0100		57.4	30-160			
Aldrin	0.0053	0.0006	ug/L	0.0100		52.8	30-160			
Heptachlor Epoxide	0.0069	0.0006	ug/L	0.0100		69.5	30-160			



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

### Chlorinated Pesticides - Quality Control

#### Batch BGL0073 - 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
<b>LCS (BGL0073-BS1)</b>										
					Prepared: 04-Dec-2018 Analyzed: 10-Dec-2018 16:03					
trans-Chlordane (beta-Chlordane)	0.0090	0.0006	ug/L	0.0100		89.5	30-160			
cis-Chlordane (alpha-chlordane)	0.0069	0.0006	ug/L	0.0100		69.2	30-160			
Endosulfan I	0.0065	0.0006	ug/L	0.0100		64.6	30-160			
4,4'-DDE	0.0155	0.0013	ug/L	0.0200		77.3	30-160			
Dieldrin	0.0138	0.0013	ug/L	0.0200		68.9	30-160			
Endrin	0.0138	0.0013	ug/L	0.0200		68.9	30-160			
Endosulfan II	0.0130	0.0013	ug/L	0.0200		65.2	30-160			
4,4'-DDD	0.0134	0.0013	ug/L	0.0200		67.0	30-160			
Endrin Aldehyde	0.0086	0.0013	ug/L	0.0200		42.8	30-160			
4,4'-DDT	0.0136	0.0013	ug/L	0.0200		67.8	30-160			
Endosulfan Sulfate	0.0125	0.0013	ug/L	0.0200		62.6	30-160			
Endrin Ketone	0.0131	0.0013	ug/L	0.0200		65.6	30-160			
Methoxychlor	0.0664	0.0063	ug/L	0.100		66.4	30-160			
Surrogate: Decachlorobiphenyl	0.0145		ug/L	0.0200		72.3	30-160			
Surrogate: Decachlorobiphenyl [2C]	0.0141		ug/L	0.0200		70.6	30-160			
Surrogate: Tetrachlorometaxylene	0.0104		ug/L	0.0200		52.2	30-160			
Surrogate: Tetrachlorometaxylene [2C]	0.0105		ug/L	0.0200		52.3	30-160			
<b>LCS Dup (BGL0073-BS1)</b>										
					Prepared: 04-Dec-2018 Analyzed: 10-Dec-2018 16:21					
alpha-BHC	0.0055	0.0006	ug/L	0.0100		54.8	30-160	7.31	30	
beta-BHC	0.0061	0.0006	ug/L	0.0100		60.6	30-160	3.53	30	
gamma-BHC (Lindane)	0.0056	0.0006	ug/L	0.0100		55.8	30-160	6.97	30	
delta-BHC	0.0064	0.0006	ug/L	0.0100		64.3	30-160	3.12	30	
Heptachlor	0.0058	0.0006	ug/L	0.0100		57.9	30-160	0.81	30	
Aldrin	0.0051	0.0006	ug/L	0.0100		51.4	30-160	0.88	30	
Heptachlor Epoxide	0.0065	0.0006	ug/L	0.0100		64.8	30-160	6.89	30	
trans-Chlordane (beta-Chlordane)	0.0082	0.0006	ug/L	0.0100		82.2	30-160	8.52	30	
cis-Chlordane (alpha-chlordane)	0.0067	0.0006	ug/L	0.0100		67.1	30-160	3.01	30	
Endosulfan I	0.0062	0.0006	ug/L	0.0100		62.1	30-160	3.96	30	
4,4'-DDE	0.0148	0.0013	ug/L	0.0200		74.1	30-160	4.26	30	
Dieldrin	0.0131	0.0013	ug/L	0.0200		65.6	30-160	4.84	30	
Endrin	0.0136	0.0013	ug/L	0.0200		67.8	30-160	1.42	30	
Endosulfan II	0.0130	0.0013	ug/L	0.0200		65.2	30-160	0.02	30	
4,4'-DDD	0.0130	0.0013	ug/L	0.0200		65.2	30-160	2.76	30	
Endrin Aldehyde	0.0082	0.0013	ug/L	0.0200		41.0	30-160	4.28	30	



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
11-Dec-2018 16:20

**Chlorinated Pesticides - Quality Control**

**Batch BGL0073 - 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
<b>LCS Dup (BGL0073-BSD1)</b>		Prepared: 04-Dec-2018 Analyzed: 10-Dec-2018 16:21								
4,4'-DDT	0.0138	0.0013	ug/L	0.0200		69.1	30-160	1.90	30	
Endosulfan Sulfate	0.0129	0.0013	ug/L	0.0200		64.7	30-160	3.25	30	
Endrin Ketone	0.0128	0.0013	ug/L	0.0200		64.0	30-160	2.53	30	
Methoxychlor	0.0668	0.0063	ug/L	0.100		66.8	30-160	0.51	30	
Surrogate: Decachlorobiphenyl	0.0131		ug/L	0.0200		65.6	30-160			
Surrogate: Decachlorobiphenyl [2C]	0.0132		ug/L	0.0200		66.1	30-160			
Surrogate: Tetrachlorometaxylene	0.00979		ug/L	0.0200		48.9	30-160			
Surrogate: Tetrachlorometaxylene [2C]	0.00961		ug/L	0.0200		48.0	30-160			



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**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8081B in Water</b>	
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
Oxychlorane	DoD-ELAP
Oxychlorane [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	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
DoD-ELAP DW	DoD-Environmental Laboratory Accreditation - Drinking Water	66169	02/07/2019
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)
- U This analyte is not detected above the applicable reporting or detection limit.
- 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.



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January 16, 2019

**Analytical Report for Service Request No: K1811642**  
**Revised Service Request No: K1811642.02**

Eric Weber  
Landau Associates, Inc.  
950 Pacific Ave., Suite 515  
Tacoma, WA 98402

**RE: Webster Nursery / 774006.040.045**

Dear Eric,

Enclosed is the revised report for the sample(s) submitted to our laboratory November 29, 2018. For your reference, these analyses have been assigned our service request number **K1811642**.

This report has been updated with the corrected Case Narrative and QC for Organochlorine Pesticides.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

We apologize for any inconvenience this may have created.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at [Kelley.Lovejoy@alsglobal.com](mailto:Kelley.Lovejoy@alsglobal.com).

Respectfully submitted,

**ALS Group USA, Corp. dba ALS Environmental**

Kelley Lovejoy  
Project Manager



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Acronyms

Qualifiers

State Certifications, Accreditations, And Licenses

Case Narrative

Chain of Custody

Organochlorine Pesticides

## Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

### **Inorganic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- E The result is an estimate amount because the value exceeded the instrument calibration range.
- J The result is an estimated value.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.
- H The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

### **Metals Data Qualifiers**

- # The control limit criteria is not applicable. See case narrative.
- J The result is an estimated value.
- E The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
- M The duplicate injection precision was not met.
- N The Matrix Spike sample recovery is not within control limits. See case narrative.
- S The reported value was determined by the Method of Standard Additions (MSA).
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
- W The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
- X See case narrative.
- + The correlation coefficient for the MSA is less than 0.995.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Organic Data Qualifiers**

- \* The result is an outlier. See case narrative.
- # The control limit criteria is not applicable. See case narrative.
- A A tentatively identified compound, a suspected aldol-condensation product.
- B The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
- C The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
- D The reported result is from a dilution.
- E The result is an estimated value.
- J The result is an estimated value.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- P The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
- U The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.  
*DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.  
  - i The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
- X See case narrative.
- Q See case narrative. One or more quality control criteria was outside the limits.

### **Additional Petroleum Hydrocarbon Specific Qualifiers**

- F The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
- L The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
- H The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
- O The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
- Y The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
- Z The chromatographic fingerprint does not resemble a petroleum product.

**ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso  
State Certifications, Accreditations, and Licenses**

<b>Agency</b>	<b>Web Site</b>	<b>Number</b>
Alaska DEH	<a href="http://dec.alaska.gov/eh/lab/cs/csapproval.htm">http://dec.alaska.gov/eh/lab/cs/csapproval.htm</a>	UST-040
Arizona DHS	<a href="http://www.azdhs.gov/lab/license/env.htm">http://www.azdhs.gov/lab/license/env.htm</a>	AZ0339
Arkansas - DEQ	<a href="http://www.adeq.state.ar.us/techsvs/labcert.htm">http://www.adeq.state.ar.us/techsvs/labcert.htm</a>	88-0637
California DHS (ELAP)	<a href="http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx">http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx</a>	2795
DOD ELAP	<a href="http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm">http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm</a>	L16-58-R4
Florida DOH	<a href="http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm">http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm</a>	E87412
Hawaii DOH	<a href="http://health.hawaii.gov/">http://health.hawaii.gov/</a>	-
ISO 17025	<a href="http://www.pjlabs.com/">http://www.pjlabs.com/</a>	L16-57
Louisiana DEQ	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	03016
Maine DHS	<a href="http://www.maine.gov/dhhs/">http://www.maine.gov/dhhs/</a>	WA01276
Minnesota DOH	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	053-999-457
Nevada DEP	<a href="http://ndep.nv.gov/bsdw/labservice.htm">http://ndep.nv.gov/bsdw/labservice.htm</a>	WA01276
New Jersey DEP	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	WA005
New York - DOH	<a href="https://www.wadsworth.org/regulatory/elap">https://www.wadsworth.org/regulatory/elap</a>	12060
North Carolina DEQ	<a href="https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification">https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification</a>	605
Oklahoma DEQ	<a href="http://www.deq.state.ok.us/CSDnew/labcert.htm">http://www.deq.state.ok.us/CSDnew/labcert.htm</a>	9801
Oregon – DEQ (NELAP)	<a href="http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	WA100010
South Carolina DHEC	<a href="http://www.scdhec.gov/environment/EnvironmentalLabCertification/">http://www.scdhec.gov/environment/EnvironmentalLabCertification/</a>	61002
Texas CEQ	<a href="http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html</a>	T104704427
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C544
Wyoming (EPA Region 8)	<a href="https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water">https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water</a>	-
Kelso Laboratory Website	<a href="http://www.alsglobal.com">www.alsglobal.com</a>	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at [www.ALSGlobal.com](http://www.ALSGlobal.com) or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/analyte is offered by that state.



## Case Narrative

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery  
**Sample Matrix:** Ground Water

**Service Request:** K1811642  
**Date Received:** 11/29/2018

### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

#### Sample Receipt:

One ground water sample was received for analysis at ALS Environmental on 11/29/2018. The sample was received in good condition and consistent with the accompanying chain of custody form. The sample was stored in a refrigerator at 4°C upon receipt at the laboratory.

#### Semivolatile GC:

Method 8081B, Organochlorine Pesticides 12/16/18: The analysis of Chlorinated Pesticides by EPA 8081 requires the use of dual column confirmation. When the Initial Calibration Verification (ICV) criteria are met for both columns, the higher of the two sample results is generally reported. The primary evaluation criteria were not met on the confirmation column for gamma-Chlordane and Endrin Aldehyde. The ICV results were reported from the acceptable column. The data quality was not affected. No further corrective action was necessary.

Method 8081B, Organochlorine Pesticides 12/16, 28/18: The recoveries of several analytes in Laboratory Control Samples (LCS/DLCS) KWG1806237-1/2 were outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The affected QC were re-analyzed based on client request, both original and re-analysis data will be reported to client.

Method 8081B, Organochlorine Pesticides 12/28/18: The recovery of Decachlorobiphenyl in Duplicate Laboratory Control Sample KWG1806237-2 was outside the control limits listed in the results summary. The limits are default values temporarily in use until sufficient data points are generated to calculate statistical control limits. Based on the method and historic data, the recoveries observed were in the range expected for this procedure. The affected QC were re-analyzed based on client request, both original and re-analysis data will be reported to client.

Method 8081B, Organochlorine Pesticides 12/16, 28/18: The PEM is being flagged in the raw data as failing on the front column due to a co-eluting interference at the same retention time as Endrin ketone resulting in an expected recovery of Endrin and increased recovery of Endrin ketone. The confirmation column does not exhibit the same interference and is passing indicating that Endrin is not breaking down. No further corrective action is required.

Approved by Kelley Lovejoy

Date 01/16/2019



# Chain of Custody

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)



# Chain-of-Custody Record

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

Date 11/28/18  
Page 1 of 1

K1811642

Turnaround Time:  
 Standard  
 Accelerated

Project Name Webster Nursery    Project No. 774000-040.045  
 Project Location/Event Tumwater, WA/quarry groundwater monitoring  
 Sampler's Name Katie Gauglitz  
 Project Contact Eric Weber/Sierra Mott  
 Send Results To eweber@landauinc.com; smott@landauinc.com

806181/Pest OC WLL

### Testing Parameters

Special Handling Requirements: \_\_\_\_\_  
 Shipment Method: \_\_\_\_\_  
 Stored on ice:  Yes /  No

Sample I.D.	Date	Time	Matrix	No. of Containers
SW-102-20181128	11/28/18	12:45	Aq	2

### Observations/Comments

Allow water samples to settle, collect aliquot from clear portion   
 NWTPH-Dx - Acid wash cleanup   
     - Silica gel cleanup   
 Dissolved metal samples were field filtered

Other \_\_\_\_\_

**Relinquished by**  
 Signature Katie Gauglitz  
 Printed Name Katie Gauglitz  
 Company Landau Associates  
 Date 11/28/18 Time 17:30

**Received by**  
 Signature Sierra Mott  
 Printed Name Sierra Mott  
 Company LA1  
 Date 11/28/18 Time 17:30

**Relinquished by**  
 Signature Sierra Mott  
 Printed Name Sierra Mott  
 Company LA1  
 Date 11/29/18 Time 15:15

**Received by**  
 Signature [Signature]  
 Printed Name BWOLF  
 Company A2S  
 Date 11/29/18 Time 1517



PC KL

### Cooler Receipt and Preservation Form

Client LANDAU ASSOCIATES Service Request K18 11642  
 Received: 11-29-18 Opened: 11-29-18 By: JSP Unloaded: 11-29-18 By: JSP

- Samples were received via?  USPS  Fed Ex  UPS  DHL  PDX  Courier  Hand Delivered
- Samples were received in: (circle)  Cooler  Box  Envelope  Other \_\_\_\_\_ NA
- Were custody seals on coolers? NA Y  N If yes, how many and where? \_\_\_\_\_  
 If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID	Tracking Number	Filed
0.8	0.9	4.1	4.2	10.1	393	NA		NA

- Packing material:  Inserts  Baggies  Bubble Wrap  Gel Packs  Wet Ice  Dry Ice  Sleeves \_\_\_\_\_
- Were custody papers properly filled out (ink, signed, etc.)? NA  Y N
- Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA  Y N  
 If applicable, tissue samples were received:  Frozen  Partially Thawed  Thawed
- Were all sample labels complete (i.e analysis, preservation, etc.)? NA  Y N
- Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA  Y N
- Were appropriate bottles/containers and volumes received for the tests indicated? NA  Y N
- Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below*  NA Y N
- Were VOA vials received without headspace? *Indicate in the table below.*  NA Y N
- Was C12/Res negative?  NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count	Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



# Organochlorine Pesticides

**ALS Environmental—Kelso Laboratory**  
1317 South 13th Avenue, Kelso, WA 98626  
Phone (360)577-7222 Fax (360)636-1068  
[www.alsglobal.com](http://www.alsglobal.com)

Analytical Results

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642  
**Date Collected:** 11/28/2018  
**Date Received:** 11/29/2018

Organochlorine Pesticides

**Sample Name:** SW-10R-20181128  
**Lab Code:** K1811642-001  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** ng/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
beta-BHC	ND	Ui	1.1	1	11/30/18	12/16/18	KWG1806237	
gamma-BHC (Lindane)	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
delta-BHC	ND	Ui	3.1	1	11/30/18	12/16/18	KWG1806237	*
Heptachlor	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Aldrin	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
Heptachlor Epoxide	550	D	20	20	11/30/18	12/17/18	KWG1806237	*
gamma-Chlordane†	82	D	10	10	11/30/18	12/16/18	KWG1806237	*
Endosulfan I	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
alpha-Chlordane	14	P	1.0	1	11/30/18	12/16/18	KWG1806237	*
Dieldrin	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
4,4'-DDE	ND	Ui	1.4	1	11/30/18	12/16/18	KWG1806237	*
Endrin	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endosulfan II	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
4,4'-DDD	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endrin Aldehyde	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endosulfan Sulfate	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
4,4'-DDT	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endrin Ketone	ND	Ui	1.6	1	11/30/18	12/16/18	KWG1806237	
Methoxychlor	ND	U	2.0	1	11/30/18	12/16/18	KWG1806237	
Toxaphene	ND	U	100	1	11/30/18	12/16/18	KWG1806237	
Chlordane	ND	Ui	180	1	11/30/18	12/16/18	KWG1806237	*

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	104	70-130	12/16/18	Acceptable
Decachlorobiphenyl	73	70-130	12/16/18	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

Analytical Results

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642  
**Date Collected:** NA  
**Date Received:** NA

Organochlorine Pesticides

**Sample Name:** Method Blank  
**Lab Code:** KWG1806237-5  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** ng/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
beta-BHC	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
gamma-BHC (Lindane)	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
delta-BHC	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Heptachlor	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Aldrin	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
Heptachlor Epoxide	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
gamma-Chlordane†	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endosulfan I	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
alpha-Chlordane	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Dieldrin	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
4,4'-DDE	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endrin	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endosulfan II	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
4,4'-DDD	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endrin Aldehyde	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endosulfan Sulfate	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
4,4'-DDT	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	*
Endrin Ketone	ND	U	1.0	1	11/30/18	12/16/18	KWG1806237	
Methoxychlor	ND	U	2.0	1	11/30/18	12/16/18	KWG1806237	
Toxaphene	ND	U	100	1	11/30/18	12/16/18	KWG1806237	
Chlordane	ND	U	20	1	11/30/18	12/16/18	KWG1806237	*

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	95	70-130	12/16/18	Acceptable
Decachlorobiphenyl	86	70-130	12/16/18	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

**Comments:** \_\_\_\_\_

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642

**Surrogate Recovery Summary  
 Organochlorine Pesticides**

**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SW-10R-20181128	K1811642-001	104	73
Method Blank	KWG1806237-5	95	86
Lab Control Sample	KWG1806237-1	73	76
Duplicate Lab Control Sample	KWG1806237-2	79	77

**Surrogate Recovery Control Limits (%)**

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Sur1 = Tetrachloro-m-xylene	70-130
Sur2 = Decachlorobiphenyl	70-130

---

Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642  
**Date Extracted:** 11/30/2018  
**Date Analyzed:** 12/16/2018

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Organochlorine Pesticides**

**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** ng/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1806237

Analyte Name	Lab Control Sample KWG1806237-1 Lab Control Spike			Duplicate Lab Control Sample KWG1806237-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
alpha-BHC	35.0	25.0	140 *	35.9	25.0	144 *	70-130	3	30
beta-BHC	29.5	25.0	118	29.8	25.0	119	70-130	1	30
gamma-BHC (Lindane)	35.8	25.0	143 *	36.3	25.0	145 *	70-130	2	30
delta-BHC	33.7	25.0	135 *	34.2	25.0	137 *	70-130	2	30
Heptachlor	33.1	25.0	132 *	34.7	25.0	139 *	70-130	5	30
Aldrin	30.9	25.0	124	32.5	25.0	130	70-130	5	30
Heptachlor Epoxide	33.8	25.0	135 *	33.4	25.0	134 *	70-130	1	30
gamma-Chlordane	34.2	25.0	137 *	35.2	25.0	141 *	70-130	3	30
Endosulfan I	30.4	25.0	122	31.2	25.0	125	70-130	3	30
alpha-Chlordane	34.3	25.0	137 *	35.8	25.0	143 *	70-130	4	30
Dieldrin	32.4	25.0	129	33.3	25.0	133 *	70-130	3	30
4,4'-DDE	34.2	25.0	137 *	34.7	25.0	139 *	70-130	2	30
Endrin	35.8	25.0	143 *	36.2	25.0	145 *	70-130	1	30
Endosulfan II	31.9	25.0	127	32.5	25.0	130	70-130	2	30
4,4'-DDD	35.9	25.0	144 *	36.0	25.0	144 *	70-130	0	30
Endrin Aldehyde	27.5	25.0	110	32.9	25.0	131 *	70-130	18	30
Endosulfan Sulfate	31.3	25.0	125	32.0	25.0	128	70-130	2	30
4,4'-DDT	33.4	25.0	134 *	34.6	25.0	138 *	70-130	4	30
Endrin Ketone	30.7	25.0	123	31.0	25.0	124	70-130	1	30
Methoxychlor	29.9	25.0	120	31.4	25.0	125	70-130	5	30
Toxaphene	1160	1000	116	1090	1000	109	70-130	7	30
Chlordane	436	500	87	425	250	170 *	70-130	3	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Results

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642  
**Date Collected:** 11/28/2018  
**Date Received:** 11/29/2018

Organochlorine Pesticides

**Sample Name:** SW-10R-20181128  
**Lab Code:** K1811642-001  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** ng/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
beta-BHC	ND	Ui	1.6	1	11/30/18	12/28/18	KWG1806237	
gamma-BHC (Lindane)	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
delta-BHC	ND	Ui	3.3	1	11/30/18	12/28/18	KWG1806237	*
Heptachlor	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Aldrin	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
Heptachlor Epoxide	<b>570</b>	D	20	20	11/30/18	12/28/18	KWG1806237	
gamma-Chlordane†	<b>80</b>	D	10	10	11/30/18	12/28/18	KWG1806237	*
Endosulfan I	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
alpha-Chlordane	<b>16</b>		1.0	1	11/30/18	12/28/18	KWG1806237	*
Dieldrin	ND	Ui	2.2	1	11/30/18	12/28/18	KWG1806237	
4,4'-DDE	ND	Ui	1.6	1	11/30/18	12/28/18	KWG1806237	
Endrin	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endosulfan II	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
4,4'-DDD	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endrin Aldehyde	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
Endosulfan Sulfate	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
4,4'-DDT	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endrin Ketone	ND	Ui	1.4	1	11/30/18	12/28/18	KWG1806237	
Methoxychlor	ND	U	2.0	1	11/30/18	12/28/18	KWG1806237	
Toxaphene	ND	U	100	1	11/30/18	12/28/18	KWG1806237	
Chlordane	ND	Ui	180	1	11/30/18	12/28/18	KWG1806237	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	102	70-130	12/28/18	Acceptable
Decachlorobiphenyl	71	70-130	12/28/18	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

**Comments:** \_\_\_\_\_

Analytical Results

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642  
**Date Collected:** NA  
**Date Received:** NA

Organochlorine Pesticides

**Sample Name:** Method Blank  
**Lab Code:** KWG1806237-5  
**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** ng/L  
**Basis:** NA  
**Level:** Low

Analyte Name	Result	Q	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
beta-BHC	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
gamma-BHC (Lindane)	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
delta-BHC	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Heptachlor	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Aldrin	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
Heptachlor Epoxide	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
gamma-Chlordane†	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endosulfan I	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
alpha-Chlordane	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Dieldrin	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
4,4'-DDE	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
Endrin	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endosulfan II	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
4,4'-DDD	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endrin Aldehyde	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
Endosulfan Sulfate	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
4,4'-DDT	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	*
Endrin Ketone	ND	U	1.0	1	11/30/18	12/28/18	KWG1806237	
Methoxychlor	ND	U	2.0	1	11/30/18	12/28/18	KWG1806237	
Toxaphene	ND	U	100	1	11/30/18	12/28/18	KWG1806237	
Chlordane	ND	U	20	1	11/30/18	12/28/18	KWG1806237	

\* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	91	70-130	12/28/18	Acceptable
Decachlorobiphenyl	83	70-130	12/28/18	Acceptable

† Analyte Comments

gamma-Chlordane For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: \_\_\_\_\_

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642

**Surrogate Recovery Summary  
 Organochlorine Pesticides**

**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** Percent  
**Level:** Low

<u>Sample Name</u>	<u>Lab Code</u>	<u>Sur1</u>	<u>Sur2</u>
SW-10R-20181128	K1811642-001	102	71
Method Blank	KWG1806237-5	91	83
Lab Control Sample	KWG1806237-1	76	72
Duplicate Lab Control Sample	KWG1806237-2	70	69 *

**Surrogate Recovery Control Limits (%)**

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Sur1 = Tetrachloro-m-xylene	70-130
Sur2 = Decachlorobiphenyl	70-130

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Results flagged with an asterisk (\*) indicate values outside control criteria.  
 Results flagged with a pound (#) indicate the control criteria is not applicable.

**Client:** Landau Associates, Inc.  
**Project:** Webster Nursery/774006.040.045  
**Sample Matrix:** Ground water

**Service Request:** K1811642  
**Date Extracted:** 11/30/2018  
**Date Analyzed:** 12/28/2018

**Lab Control Spike/Duplicate Lab Control Spike Summary**  
**Organochlorine Pesticides**

**Extraction Method:** EPA 3511  
**Analysis Method:** 8081B

**Units:** ng/L  
**Basis:** NA  
**Level:** Low  
**Extraction Lot:** KWG1806237

Analyte Name	Lab Control Sample KWG1806237-1 Lab Control Spike			Duplicate Lab Control Sample KWG1806237-2 Duplicate Lab Control Spike			%Rec Limits	RPD	RPD Limit
	Result	Spike Amount	%Rec	Result	Spike Amount	%Rec			
alpha-BHC	34.9	25.0	140 *	33.0	25.0	132 *	70-130	6	30
beta-BHC	30.7	25.0	123	30.6	25.0	123	70-130	0	30
gamma-BHC (Lindane)	35.3	25.0	141 *	33.4	25.0	134 *	70-130	5	30
delta-BHC	32.8	25.0	131 *	31.2	25.0	125	70-130	5	30
Heptachlor	33.1	25.0	132 *	30.1	25.0	120	70-130	9	30
Aldrin	32.0	25.0	128	30.3	25.0	121	70-130	5	30
Heptachlor Epoxide	32.6	25.0	130	30.9	25.0	124	70-130	5	30
gamma-Chlordane	33.4	25.0	134 *	34.9	25.0	140 *	70-130	4	30
Endosulfan I	29.8	25.0	119	27.8	25.0	111	70-130	7	30
alpha-Chlordane	34.3	25.0	137 *	32.6	25.0	131 *	70-130	5	30
Dieldrin	31.2	25.0	125	27.2	25.0	109	70-130	14	30
4,4'-DDE	32.3	25.0	129	31.1	25.0	124	70-130	4	30
Endrin	33.8	25.0	135 *	33.2	25.0	133 *	70-130	2	30
Endosulfan II	32.0	25.0	128	30.7	25.0	123	70-130	4	30
4,4'-DDD	35.0	25.0	140 *	35.4	25.0	142 *	70-130	1	30
Endrin Aldehyde	30.6	25.0	123	25.3	25.0	101	70-130	19	30
Endosulfan Sulfate	31.4	25.0	126	30.8	25.0	123	70-130	2	30
4,4'-DDT	32.7	25.0	131 *	32.8	25.0	131 *	70-130	0	30
Endrin Ketone	27.9	25.0	112	26.7	25.0	107	70-130	4	30
Methoxychlor	29.9	25.0	120	29.8	25.0	119	70-130	0	30
Toxaphene	1060	1000	106	964	1000	96	70-130	9	30
Chlordane	442	500	88	401	500	80	70-130	10	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.