

October 17, 2019

Project No. 923-1000-005.2019

Mr. Bill Kombol

Landsburg PLP Group
31407 Highway 169
PO Box 10
Black Diamond, WA 98010

LANDSBURG MINE SITE SHORT-TERM COMPLIANCE MONITORING REPORT AUGUST 2019 SAMPLING

Dear Bill,

The Compliance Monitoring Plan (CMP) (Golder 2017)¹ requires short-term compliance monitoring be conducted during the remediation to ensure that there are no adverse effects to the environment from remediation activities. The CMP states that short-term compliance monitoring will commence when the trench-backfilling begins and will continue for a period of four weeks following completion of the backfilling. To meet this requirement Golder Associates Inc. (Golder) completed short-term compliance monitoring events at the Landsburg Mine Site (the Site) starting in June 2019 and extending for four weeks following completion of the backfilling, which was completed on August 7, 2019. This letter report presents the results of the two short-term monitoring events completed in August 2019. The first event was conducted from August 14 to 16, 2019, and included collecting groundwater samples from monitoring wells LMW-2, LMW-3, LMW-4, LMW-5, LMW-6, LMW-7, LMW-8, LMW-9, LMW-10, LMW-11, LMW-12, LMW-13R, LMW-14, and LMW-15. The first event of August also served as a quarterly monitoring event for groundwater monitoring wells located at the north end of the site (LMW-2, LMW-4, LMW-10, LMW-12 and LMW-13R). The second event of August was conducted from August 27 to 28, 2019, and included field measurements of groundwater quality parameters from the monitoring wells.

Figure 1 presents the locations of the monitoring wells. Figures 2A and 2B present a cross-section along the strike at the coal seam that also depicts the location of the monitoring wells. Monitoring wells LMW-2, LMW-4, LMW-10, LMW-12 and LMW-13R are completed to monitor shallow, middle, and deeper zones within the north end of the Rogers Coal Mine subsidence trench. Monitoring wells LMW-3, LMW-5, LMW-8, LMW-9, LMW-11, LMW-14 and LMW-15 are completed to monitor shallow, middle and deeper zones along the southern half of the Rogers Coal Mine. LMW-14 was installed in April 2019 as a south sentinel well and to provide groundwater elevation data at a location immediately south of the trench areas that will be backfilled and capped as part of the

¹ Golder Associates Inc. (Golder). 2017. Exhibit D of the Consent Decree – Compliance Monitoring Plan Landsburg Mine Site MTCA Remediation Project, Ravensdale, Washington. Prepared by Golder Associates Inc. June 7.

Site remedial action. Wells LMW-6 and LMW-7 monitor groundwater from the Frasier and Landsburg Coal Mines to the west and east of the Rogers Coal Mine, respectively.

Groundwater sampling was conducted in accordance with the CMP (Golder 2017), and included the following activities:

- Measurement of static water levels at monitoring wells.
- Well purging with the dedicated pumping systems installed in each well to ensure sample representativeness.
- Measurement of field parameters including: pH, specific conductance, temperature, dissolved oxygen, oxidation-reduction potential (ORP) and turbidity.
- Collection of representative samples in appropriate containers provided by the analytical laboratory and associated analyses of groundwater samples. Groundwater samples were analyzed for volatile organic compounds (VOCs; by United States Environmental Protection Agency [EPA] Method 8260C) and a total petroleum hydrocarbon (TPH) identification scan (by NWTPH-HCID). Under the CMP, sample analyses for VOCs and TPH are only performed monthly during short-term compliance monitoring. The groundwater samples collected from wells on the north end of the Site (LMW-2, LMW-4, LMW-10, LMW-12 and LMW-13R) during the August 14 through 16, 2019 event were also analyzed for 1,4-dioxane (by EPA Method 8270D).

Field sampling activities were documented on Sample Integrity Data Sheets (SIDS), provided in Appendix A. Tables 1A and 1B present depths to groundwater measured during the two events and calculated static water level elevations.

Following sample collection, all bottles were sealed, labeled, and placed in an iced cooler until delivery to the laboratory. Groundwater samples were transported under chain-of-custody procedures to Analytical Resources Incorporated (ARI), of Tukwila, Washington, for analyses.

Appendix B presents the laboratory analytical reports and the data validation report with added data qualifiers noted. The laboratory data packages underwent data validation. Items of note are provided in a validation memorandum in Appendix B. Data were found to be acceptable without qualifications.

Table 2 presents the field parameter measurements and laboratory analytical results for each groundwater sample. Laboratory analyses did not detect TPH in any of the groundwater samples, and there were no VOCs detected in groundwater above the triggers level concentrations prescribed in the CMP (Golder 2017). The only parameters detected in groundwater samples above the laboratory reporting limits during the August 14-16, 2019 sampling event were benzene, carbon disulfide, chloroethane, ethylbenzene, toluene, and 1,4-dioxane.

Carbon disulfide was detected in LMW-2 (0.15 µg/L), LMW-4 (0.16 µg/L), LMW-10 (0.27 µg/L), LMW-13R (0.11 µg/L), and LMW-15 (1.1 µg/L). All detected concentrations of carbon disulfide are considerably lower than the MTCA Method A groundwater cleanup level of 800 µg/L. Carbon disulfide has been detected at these low levels in Site groundwater in previous sampling events. The detection of carbon disulfide is attributed to being present in the coal bed material as a natural constituent.

Chloroethane was detected in LMW-12 at a concentration of 0.44 µg/L. The detected concentration is significantly less than the MTCA Method B groundwater cleanup level of 80 µg/L.

Trace concentrations of benzene, ethylbenzene, toluene, and xylenes were detected in LMW-14. All detections were at least 10 times lower than their respective MTCA Method A groundwater cleanup levels.

1,4-Dioxane was detected in LMW-2 (1.8 µg/L), LMW-4 (1.5 µg/L), and LMW-12 (1.6 µg/L). The MTCA Method B groundwater cleanup level for 1,4-dioxane is 0.438 µg/L. 1,4-dioxane was initially detected in LMW-2 and LMW-4 in the November 2017 sampling event, which is the first sampling round that included analysis of 1,4-dioxane at the Site. 1,4-dioxane concentrations detected during the August 2019 round are consistent with historic concentrations detected at the Site since November 2017. 1,4-dioxane is detected in LMW-12 at low concentrations but has not been detected in LMW-13R. 1,4-Dioxane has not been detected in any other Site monitoring wells. The 1,4-dioxane detection is being addressed by the Landsburg Mine Site Group in cooperation with Ecology.

Table 3 presents the groundwater quality parameters (pH, specific conductance, temperature, dissolved oxygen, ORP, and turbidity) for the events completed in June, July, and August 2019, as well as the May 2019 event that was conducted immediately preceding the start of short-term compliance monitoring. Groundwater quality parameters do not appear to be trending significantly upwards or downwards and are within historical norms.

If you have any questions or require any additional information, please contact Gary Zimmerman at (425) 883-0777.

Sincerely,

Golder Associates Inc.



Joseph Xi
Senior Project Engineer



Gary Zimmerman
Principal

JX/GZ/sb

Attachments: Table 1A: Groundwater Elevation Data, Landsburg Mine Site, August 14-16, 2019
Table 1B: Groundwater Elevation Data, Landsburg Mine Site, August 27-28, 2019
Table 2: August 2019 Groundwater Analytical Results Landsburg Mine Site
Table 3: Short-Term Monitoring Groundwater Parameter Trends
Figure 1: Groundwater Monitoring Locations
Figure 2A: Cross-Section along Strike at Coal Seam, August 14, 2019
Figure 2B: Cross-Section along Strike at Coal Seam, August 27-28, 2019
Appendix A: Sample Integrity Data Sheets (SIDS)
Appendix B: Laboratory Analytical Reports Data Validation and Quality Assurance /
Quality Control Review Memorandum and August 2019 Laboratory Analytical Report

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Tables

Table 1A: Groundwater Elevation Data, Landsburg Mine Site, August 14, 2019

	LMW-1	LMW-2	LMW-3	LMW-4 ¹	LMW-5	LMW-6	LMW-7 ¹	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13R	LMW-14 ¹	LMW-15
Water Depths															
Date of data collection	NC	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019
Time of data collection	NC	9:30 AM	11:02 AM	9:39 AM	11:05 AM	10:02 AM	8:19 AM	11:10 AM	10:56 AM	9:37 AM	10:32 AM	9:33 AM	9:35 AM	10:16 AM	10:27 AM
Measured to Top of PVC (ft btc)	NC	8.79	12.68	9.58	14.22	40.76	211.45	4.80	99.93	0.20	157.78	11.71	12.23	160.79	151.86
Surveyed Elevation															
Top of PVC (ft asl)	765.36	617.79	656.75	619.27	658.27	632.33	771.51	646.97	743.99	618.98	802.19	625.35	625.86	805.12	796.46
Top of Monument (ft asl)	766.16	618.38	657.48	619.89	658.87	633.00	771.88	NC	NC	619.10	802.51	625.49	625.91	805.14	796.61
Ground Level (ft asl)	763.02	614.92	654.40	617.37	655.63	629.95	768.79	645.25	741.13	615.78	799.89	621.90	622.07	802.22	792.64
Corrected Water Elevation															
Using PVC elevation (ft asl)	NA	609.00	644.07	609.69	644.05	591.57	560.06	642.17	644.06	618.78	644.41	613.64	613.63	644.33	644.60

Notes:
¹ Data corrected to accommodate well inclination from vertical
NA = Not applicable
NC = Data not collected
ft btc = feet below top of casing
ft asl = feet above sea level

Table 1B: Groundwater Elevation Data, Landsburg Mine Site, August 27-28, 2019

	LMW-1	LMW-2	LMW-3	LMW-4 ¹	LMW-5	LMW-6	LMW-7 ¹	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13R	LMW-14 ¹	LMW-15
Water Depths															
Date of data collection	NC	8/28/2019	8/28/2019	8/28/2019	8/28/2019	8/28/2019	8/28/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019	8/27/2019
Time of data collection	NC	1:32 PM	9:50 AM	12:40 PM	10:43 AM	2:38 PM	8:45 AM	4:11 PM	3:23 PM	2:20 PM	12:27 PM	9:05 AM	9:47 AM	10:42 AM	1:21 PM
Measured to Top of PVC (ft btc)	NC	8.70	13.49	10.21	14.91	42.53	211.57	4.96	99.96	0.70	157.81	11.50	12.03	160.84	151.89
Surveyed Elevation															
Top of PVC (ft asl)	765.36	617.79	656.75	619.27	658.27	632.33	771.51	646.97	743.99	618.98	802.19	625.35	625.86	805.12	796.46
Top of Monument (ft asl)	766.16	618.38	657.48	619.89	658.87	633.00	771.88	NC	NC	619.10	802.51	625.49	625.91	805.14	796.61
Ground Level (ft asl)	763.02	614.92	654.40	617.37	655.63	629.95	768.79	645.25	741.13	615.78	799.89	621.90	622.07	802.22	792.64
Corrected Water Elevation															
Using PVC elevation (ft asl)	NA	609.09	643.26	609.06	643.36	589.80	559.94	642.01	644.03	618.28	644.38	613.85	613.83	644.28	644.57

Notes:
¹ Data corrected to accommodate well inclination from vertical
NA = Not applicable
NC = Data not collected
ft btc = feet below top of casing
ft asl = feet above sea level

Table 2: August 2019 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-4 Duplicate	LMW-5	LMW-6	LMW-7	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13R	LMW-14	LMW-15	Equipment Blank	Field Blank	Trip Blank
		8/14/2019	8/15/2019	8/14/2019	8/14/2019	8/15/2019	8/15/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/15/2019	8/14/2019	8/14/2019	8/15/2019	8/15/2019	8/14/2019	8/15/2019	-
Field Parameter																			
Temperature	°C	10.5	11.1	10.6	-	10.8	9.6	12.3	14.3	11	12.2	10.8	11.4	13.2	10.6	10.1	-	-	-
pH	stnd	6.81	7.65	6.89	-	6.81	6.69	7.03	6.79	6.93	8.61	7.18	6.71	7.32	6.56	7.48	-	-	-
Conductivity	uS/cm	753	242	762	-	564	190	455	582	550	292	401	758	758	1489	359	-	-	-
Dissolved Oxygen	mg/L	0.6	0.65	0.57	-	0.63	0.69	0.64	0.61	0.76	0.56	0.96	0.58	1.34	0.7	0.9	-	-	-
ORP	mV	-95.2	-57.9	-101.4	-	-79.0	-48.8	-60.2	-88.3	-48.8	-227.4	-66.4	-93.0	-111.4	-64.6	-131.7	-	-	-
Turbidity	NTU	0.11	0.76	0.63	-	0.69	1.98	4.26	1.14	1.57	0.46	0.93	7.09	0.35	8.34	6.62	-	-	-
Volatile Organic Compounds (VOCs)																			
Acetone	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acrolein	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Acrylonitrile	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.27	0.2 U	0.2 U	0.2 U	0.2 U
Bromobenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
methyl ethyl ketone	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
n-Butylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Sec-Butylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
tert-butylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon Disulfide	ug/L	0.15	0.1 U	0.16	0.14	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.28	0.1 U	0.1 U	0.12	0.1 U	0.82	0.1 U	0.1 U	0.1 U
Carbon Tetrachloride	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.44	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Chloroethyl vinyl ether	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
4-Chlorotoluene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dichlorodifluoromethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-Chloropropane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylene Dibromide	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Dibromomethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trans-1,4-Dichloro-2-butene	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Cis-1,2-Dichloroethene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trans-1,2-Dichloroethene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
2,2-Dichloropropane	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
1,1-Dichloropropene	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Cis-1,3-Dichloropropene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trans-1,3-Dichloropropene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.26	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone	ug/L	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Iodomethane	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table 2: August 2019 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-4 Duplicate	LMW-5	LMW-6	LMW-7	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13R	LMW-14	LMW-15	Equipment Blank	Field Blank	Trip Blank
Cumene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
p-Isopropyltoluene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methylene Chloride	ug/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl isobutyl ketone	ug/L	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
Naphthalene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Propylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Styrene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trichlorobenzene	ug/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1,2-Tetrachloroethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Tetrachloroethene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.57	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CFC-113	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichloropropane	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trimethylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Acetate	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	ug/L	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
m, p-Xylene	ug/L	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
o-Xylene	ug/L	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Total Xylenes	ug/L	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
Semi-Volatile Organic Compounds (SVOCs)																			
1,4-Dioxane	ug/L	1.8	NS	1.5	1.6	NS	NS	NS	NS	NS	0.4 U	NS	1.6	0.4 U	NS	NS	NS	0.4 U	NS
Hydrocarbon Identification																			
Diesel Range	mg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NS	NS
Gas Range	mg/L	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	NS	NS
Lube Oil Range	mg/L	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	NS	NS

Notes:
NS - Not Sampled
U - Analyte was not detected above the Reporting Limit (RL).
J - Analyte was detected above the Method Detection Limit (MDL) but below the RL.

Table 3: Short Term Groundwater Monitoring Field Parameter Measurements

Well	Date	Temperature (°C)	pH	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)
LMW-2	5/22/2019	10.8	6.89	677	0.50	-109.8	0.31
LMW-2	6/13/2019	10.8	6.79	729	0.55	-122.7	0.77
LMW-2	6/26/2019	10.9	6.86	746	0.64	-83.4	0.44
LMW-2	7/9/2019	11.1	6.80	NC	0.11	Note 1	0.89
LMW-2	7/23/2019	11.1	6.80	NC	0.57	-96.3	0.43
LMW-2	8/14/2019	10.5	6.81	753	0.60	-95.2	0.11
LMW-2	8/28/2019	11.3	6.78	736	0.63	-119.0	0.54
LMW-3	5/21/2019	10.5	7.73	235	0.52	-72.6	0.49
LMW-3	6/12/2019	10.9	7.67	248	0.57	-32.2	0.67
LMW-3	6/25/2019	11.2	7.73	242	0.56	-23	0.45
LMW-3	7/10/2019	11.1	7.69	NC	0.25	Note 1	0.63
LMW-3	7/24/2019	11.2	7.54	NC	0.61	-37.4	Note 2
LMW-3	8/15/2019	11.1	7.65	242	0.65	-57.9	0.76
LMW-3	8/28/2019	10.8	7.53	249	0.64	-35.0	0.74
LMW-4	5/22/2019	10.5	6.92	697	0.53	-120.5	0.64
LMW-4	6/13/2019	10.6	6.85	726	0.76	-151.8	0.23
LMW-4	6/25/2019	10.5	6.93	743	0.60	-95.9	0.16
LMW-4	7/9/2019	11.0	6.87	NC	0.10	Note 1	0.32
LMW-4	7/23/2019	10.8	6.91	NC	0.70	-112.7	0.11
LMW-4	8/14/2019	10.6	6.89	762	0.57	-101.4	0.63
LMW-4	8/28/2019	11.3	6.85	743	0.65	-106.5	0.79
LMW-5	5/21/2019	10.6	6.92	548	0.48	-121.3	0.16
LMW-5	6/12/2019	10.7	6.82	586	0.51	-99.5	2.35
LMW-5	6/25/2019	10.7	6.86	569	0.57	-121.1	0.62
LMW-5	7/10/2019	11.0	6.87	NC	0.12	Note 1	0.12
LMW-5	7/24/2019	10.7	6.72	NC	0.95	-83.7	Note 2
LMW-5	8/15/2019	10.8	6.81	564	0.63	-79.0	0.69
LMW-5	8/28/2019	10.8	6.73	581	0.66	-95.7	0.88
LMW-6	5/22/2019	9.4	6.80	180	0.57	-55.3	1.95
LMW-6	6/12/2019	9.6	6.75	188	0.59	-46.4	3.31
LMW-6	6/26/2019	9.8	6.83	190	0.63	-34.5	1.59
LMW-6	7/9/2019	10.2	6.79	NC	0.19	Note 1	1.39
LMW-6	7/24/2019	9.9	6.52	NC	0.68	-32.8	1.48
LMW-6	8/15/2019	9.6	6.69	190	0.69	-48.8	1.98
LMW-6	8/28/2019	10.3	6.75	197	0.68	-89.9	3.5
LMW-7	5/21/2019	13.0	7.15	419	0.59	-77.5	3.71
LMW-7	6/13/2019	14.4	7.23	409	1.14	-47.2	5.7
LMW-7	6/25/2019	13.1	7.13	423	0.63	-46.1	1.38
LMW-7	7/9/2019	13.4	7.06	NC	0.24	Note 1	2.45
LMW-7	7/24/2019	12.8	7.01	NC	0.78	-58.5	1.13
LMW-7	8/14/2019	12.3	7.03	455	0.64	-60.2	4.26
LMW-7	8/28/2019	12.5	6.98	435	0.81	-80.7	4.42

Table 3: Short Term Groundwater Monitoring Field Parameter Measurements

Well	Date	Temperature (°C)	pH	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)
LMW-8	5/21/2019	11.1	6.79	429	0.53	-103.7	8.45
LMW-8	6/12/2019	13.4	6.70	515	0.61	-100.7	5.44
LMW-8	6/25/2019	12.6	6.81	505	0.66	-96.3	4.55
LMW-8	7/10/2019	14.1	6.81	NC	0.18	Note 1	4.93
LMW-8	7/24/2019	13.4	6.69	NC	0.64	-16.3	Note 2
LMW-8	8/14/2019	14.3	6.79	582	0.61	-88.3	1.14
LMW-8	8/27/2019	14.4	6.81	518	0.63	-105.9	0.4
LMW-9	5/21/2019	10.2	6.99	507	0.69	-67.4	2.48
LMW-9	6/11/2019	10.8	6.94	542	0.72	-69.6	2.34
LMW-9	6/25/2019	10.4	6.97	524	0.83	-50.7	0.31
LMW-9	7/10/2019	10.8	6.98	NC	0.36	Note 1	0.89
LMW-9	7/24/2019	10.7	6.77	NC	0.78	-45.9	2.24
LMW-9	8/14/2019	11.0	6.93	550	0.76	-48.8	1.57
LMW-9	8/27/2019	10.9	6.96	489	0.78	-71.4	0.39
LMW-10	5/22/2019	10.4	8.64	266	0.52	-210.4	0.84
LMW-10	6/11/2019	12.1	8.63	287	0.49	-153.7	0.97
LMW-10	6/26/2019	11.6	8.69	282	0.59	-168.9	0.75
LMW-10	7/9/2019	11.9	8.60	NC	0.09	Note 1	0.57
LMW-10	7/23/2019	11.8	8.57	NC	0.67	-163.6	1.02
LMW-10	8/14/2019	12.2	8.61	292	0.56	-227.4	0.46
LMW-10	8/27/2019	12.8	8.65	266	0.61	-166.7	1.08
LMW-11	5/20/2019	9.8	7.21	390	0.78	-137.1	0.77
LMW-11	6/11/2019	10.3	7.18	412	0.87	-55.8	0.28
LMW-11	6/25/2019	10.0	7.20	391	0.95	-75.3	0.28
LMW-11	7/11/2019	10.3	7.20	NC	0.54	Note 1	0.32
LMW-11	7/23/2019	10.0	7.18	NC	1.05	-64.3	0.73
LMW-11	8/15/2019	10.8	7.18	401	0.96	-66.4	0.93
LMW-11	8/27/2019	10.5	7.20	372	0.91	-90.4	1.29
LMW-12	5/22/2019	10.1	6.80	667	0.54	-105.8	4.11
LMW-12	6/11/2019	11.2	6.74	720	0.52	-76.9	57.2
LMW-12	6/26/2019	10.4	6.72	681	0.65	-71.8	15.4
LMW-12	7/9/2019	10.8	6.76	NC	0.12	Note 1	4.37
LMW-12	7/23/2019	10.5	6.62	NC	0.66	-98.8	10.4
LMW-12	8/14/2019	11.4	6.71	758	0.58	-93.0	7.09
LMW-12	8/27/2019	11.4	6.44	607	0.64	-72.3	4.59
LMW-13R	5/22/2019	10.2	7.37	656	0.57	-157	1.29
LMW-13R	6/11/2019	11.6	7.36	711	0.54	-132	0.54
LMW-13R	6/26/2019	11.0	7.39	701	0.63	-114.2	0.58
LMW-13R	7/9/2019	11.6	7.34	NC	0.19	Note 1	0.43
LMW-13R	7/23/2019	10.8	7.30	NC	0.62	-123.9	0.52
LMW-13R	8/14/2019	13.2	7.32	758	1.34	-111.4	0.35
LMW-13R	8/27/2019	10.9	7.29	637	0.68	-124.8	0.63

Table 3: Short Term Groundwater Monitoring Field Parameter Measurements

Well	Date	Temperature (°C)	pH	Conductivity (uS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)
LMW-14	5/20/2019	10.0	6.72	1159	0.88	-78.9	1.59
LMW-14	6/11/2019	10.6	6.60	1497	1.41	-45.5	1.3
LMW-14	6/26/2019	10.6	6.62	1540	1.14	-38.1	2.16
LMW-14	7/10/2019	10.7	6.63	NC	0.59	Note 1	3.62
LMW-14	7/23/2019	10.4	6.59	NC	1.12	-57.1	2.7
LMW-14	8/15/2019	10.6	6.56	1489	0.70	-64.6	8.34
LMW-14	8/27/2019	11.5	6.58	1445	0.73	-69.1	5.49
LMW-15	5/20/2019	9.5	7.56	356	0.82	-157.2	7.15
LMW-15	6/11/2019	11.5	7.51	383	1.08	-120.5	1.28
LMW-15	6/25/2019	9.9	7.52	358	1.06	-134.9	2.68
LMW-15	7/11/2019	10.0	7.51	NC	0.38	Note 1	2.32
LMW-15	7/23/2019	9.9	7.49	NC	1.03	-136.4	2.22
LMW-15	8/15/2019	10.1	7.48	359	0.90	-131.7	6.62
LMW-15	8/27/2019	10.2	7.46	332	1.01	-140.3	3.55

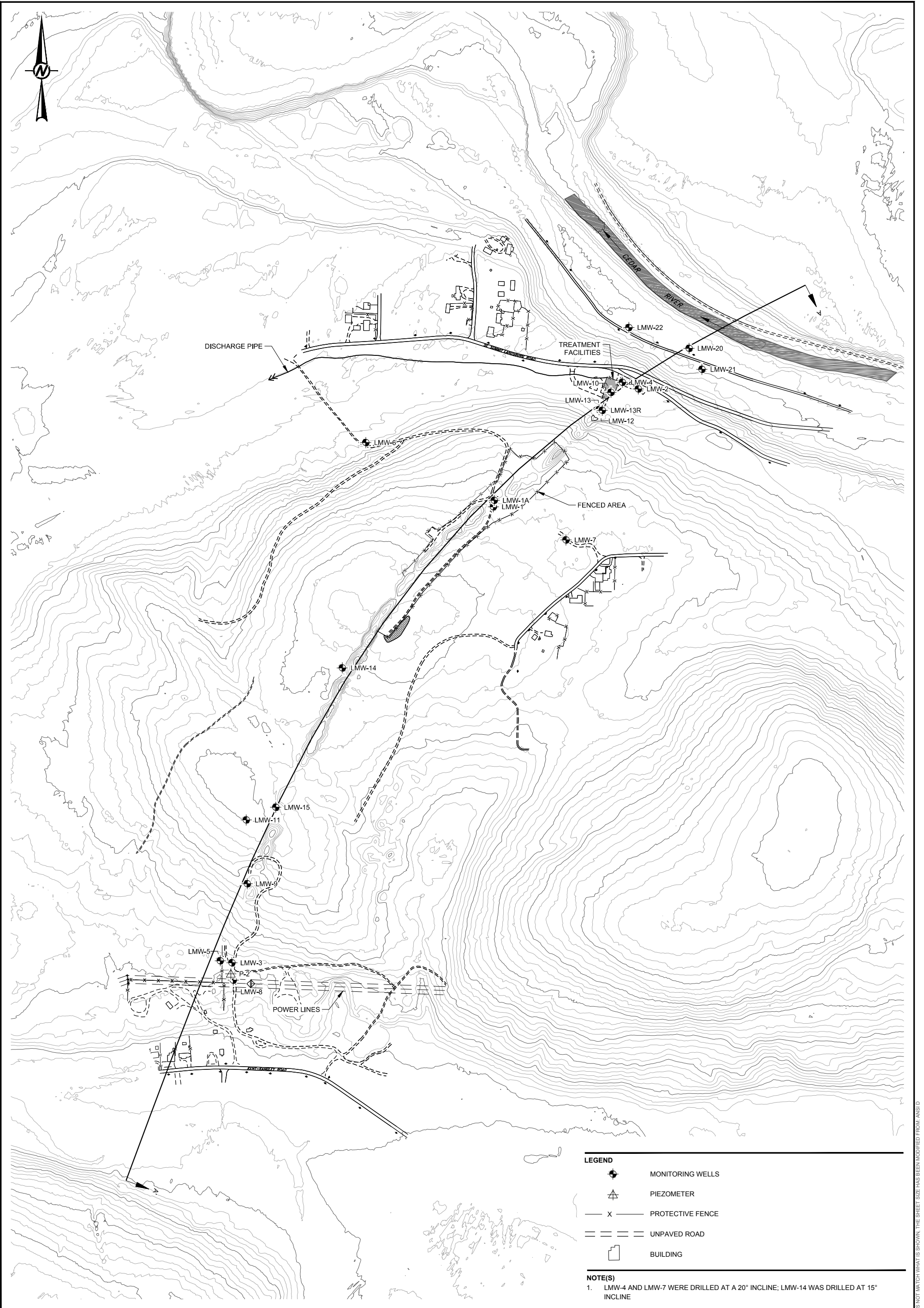
NC - Not Collected

Notes:

1 - ORP values anomalous due to faulty YSI and not recorded.

2 - No values were recorded due to faulty turbidity meter.

Figures



- LEGEND**
- MONITORING WELLS
 - PIEZOMETER
 - PROTECTIVE FENCE
 - UNPAVED ROAD
 - BUILDING

NOTE(S)

1. LMW-4 AND LMW-7 WERE DRILLED AT A 20° INCLINE; LMW-14 WAS DRILLED AT 15° INCLINE

CLIENT
LANDSBURG MINE SITE PLP GROUP

PROJECT
LANDSBURG MINE SITE
MTCA REMEDIAL ACTION

CONSULTANT

YYYY-MM-DD	2019-04-25
DESIGNED	XXX
PREPARED	XXX
REVIEWED	XXX
APPROVED	XXX

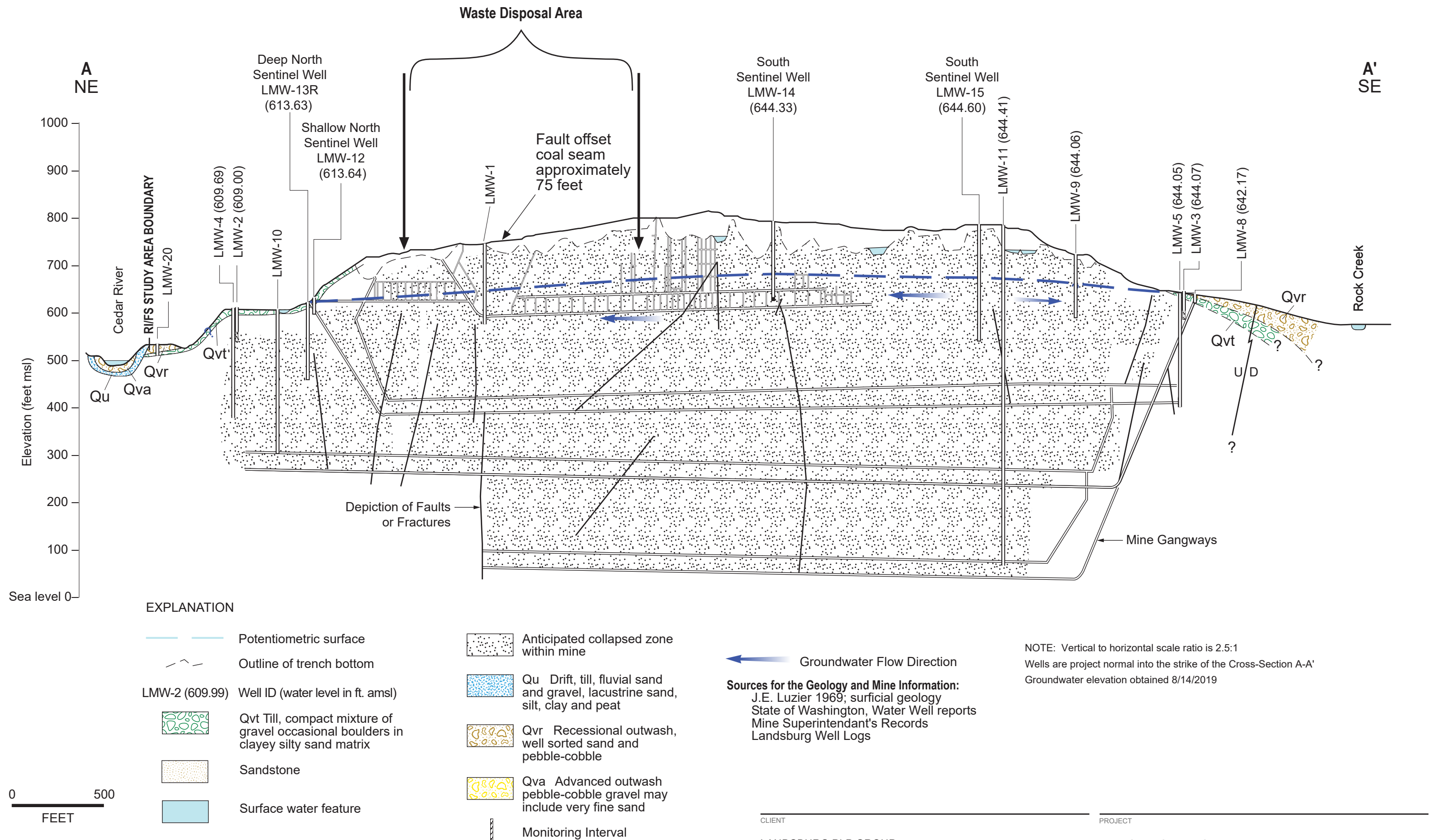


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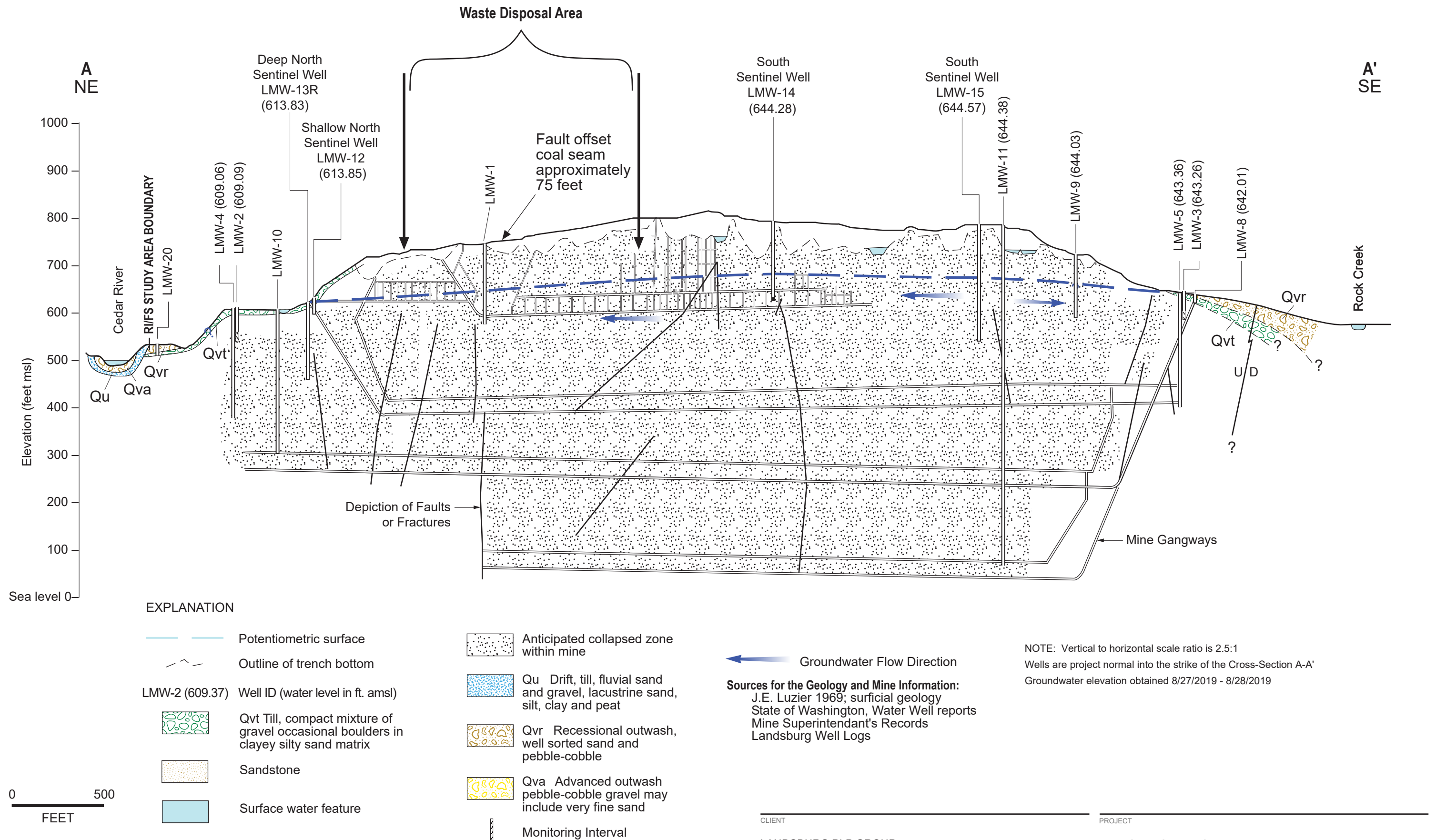
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0 300 600
1" = 300' FEET

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CLIENT			PROJECT		
LANDSBURG PLP GROUP			LANDSBURG MINE SITE		
CONSULTANT			TITLE		
			CROSS-SECTION ALONG STRIKE AT COAL SEAM AUGUST 27-28, 2019		
			CROSS-SECTION A-A'		
			PROJECT No. 923-1000		
			PHASE 2019		
			FIGURE 2B		

APPENDIX A

**Sample Integrity Data Sheets
(SIDS)**

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019
Site Location Ravensdale, WA Sample ID LMW-2-0819
Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/14/19 Time 1005

Media Water Station LMW-2

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 8.79' ^{@ 0930} ft below TOC (monument at elev. X) (bottom at 38.1 ft bgs, 4-in casing)

Screen Interval - 27.9-38.1 ft bgs Monument: 2.94 ags

Sand Pack Interval - 24.8-38.1 ft bgs (8-in hole) (~7.8 gal/sand pack vol)

Packer Depth - NA (~22.3 gal/casing vol) (~30.1 gal/total well vol)

Sample Description clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl
2 - 500 mL	1,4-Dioxane	Glass Amber	None
4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature] Date 8/14/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW 2
 Date 8/14/19
 Time Begin Purge 0937
 Time Collect Sample 1005

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
8.83	0942	10.4	6.83	1044/754	0.79	-53.0	0.28
8.83	0947	10.5	6.80	1044/754	0.67	-71.3	0.25
8.83	0952	10.5	6.80	1043/754	0.64	-79.8	0.15
8.83	0957	10.5	6.81	1044/754	0.61	-88.3	0.34
8.83	1002	10.5	6.81	1043/753	0.60	-95.2	0.11
	1005	collect Sample					

Comments:

Grundfos: ~80 Htz

Flow Rate: 0.85 gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-3-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/15/19 Time 1445

Media Water Station LMW-3

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 13.52' @ 1333 ft below TOC (monument at elev. X) (bottom at 64.8 ft bgs, 4-in casing)

Screen Interval - 49.8-64.8 ft bgs Monument: 3.08 ags

Sand Pack Interval - 47.1-64.8 ft bgs (8-in hole) (~10.4 gal/sand pack)

Packer Depth - 39.33 ft bgs (~36.1 gal/casing vol) (~16.6 gal/packer casing volume)

(~27.0 gal/total well vol below packer)

Sample Description clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
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3 - 40 mL	VOA	VOA Vial	HCl
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4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
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Sampler (signature) [Signature] Date 8/15/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-3
 Date 8/15/19
 Time Begin Purge 1411
 Time Collect Sample 1445

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
12.97	1416	11.1	7.77	324.0/238.3	1.12	1107.0	1.54
12.97	1421	11.1	7.70	324.8/239.0	0.80	149.5	1.28
12.97	1426	11.1	7.70	326.7/240.2	0.72	-13.8	0.88
12.97	1431	11.1	7.68	328.0/240.9	0.71	-36.5	0.72
12.98	1436	11.1	7.65	330.6/242.7	0.65	-49.6	1.06
12.99	1441	11.1	7.65	329.6/242.1	0.65	-57.9	0.76
	1445	collect sample					

Comments:

Grundfos: 135 Htz
 Packer: 130psi

Flow Rate 0.8 gpm

8/15 1330 Dropped ^{dedicated} discharge tubing into well. Possible to
 still collect sample tomorrow via peristaltic.
 1411 — Partially inflated packer, pulled well ~20', tubing
 came out with it!

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site

Project No. 923-1000-005.2019

Site Location Ravensdale, WA

Sample ID LMW-4-0819 / LMW-4-0819-D
(duplicate)

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/14/19

Time 1055/1100 (dup)

Media Water

Station LMW-4

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 11.01 @ 1028 ft below TOC (monument at elev. X) (bottom at 209.7 ft bgs, 4-in casing)

Screen Interval - 195-209.7 ft bgs Monument: 2.76 ags

Sand Pack Interval - 189-209.7 ft bgs (8-in hole) (~12.3 gal/sand pack)

Packer Depth - 187.3 ft bgs (~133.3 gal/casing vol) (~14.6 gal/packer casing volume)

(~26.9 gal/total well vol below packer)

** Depths corrected for 70° inclination

Sample Description Clear, slight sulfur odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

	Aliquot Amount	Analysis	Container	Preservation / Amount
2 x	3 - 40 mL	VOA	VOA Vial	HCl
2 x	2 - 500 mL	1,4-Dioxane	Glass Amber	None
2 x	4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature]

Date 8/14/2019

Supervisor (signature) [Signature]

Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-4
 Date 8/14/19
 Time Begin Purge 1030
 Time Collect Sample 1055/1100 (dup)

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
11.01	1035	10.5	6.91	1045/756	0.67	-101.2	0.41
11.02	1040	10.5	6.90	1050/760	0.61	-99.2	0.17
11.02	1045	10.6	6.90	1050/761	0.59	-100.2	0.29
11.02	1050	10.6	6.89	1052/762	0.57	-101.4	0.63
<u>————— 1055 — Sample —————</u>							

Comments:

Grundfos: 80 Htz
 Packer: 110psi

Flow Rate 0.55 gpm

Duplicate at 1100

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-5-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/15/2019 Time 1530

Media Water Station LMW-5

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 14.93' @ 1505 ft below TOC (monument at elev. X) (bottom at 241.8 ft bgs, 4-in casing)

Screen Interval - 231.8-241.8 ft bgs Monument: 3.24 ags

Sand Pack Interval - 231.8-241.8 ft bgs (8-in hole) (~5.9 gal/sand pack)

Packer Depth - 222.11 ft bgs (~150.8 gal/casing vol) (~12.9 gal/packer casing volume)

(~18.7 gal/total well vol below packer)

Sample Description Clear, sulfur odor.

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl
4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature] Date 8/15/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-5
Date 8/5/19
Time Begin Purge 1505
Time Collect Sample 1530

[illegible]

Comments:

Grundfos: 135 Htz
Packer: 110psi

Flow Rate 1 gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-6-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/15/2019 Time 0900

Media Water Station LMW-6

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL 41.65 00828 23.65 ft below TOC (monument at elev. X) (bottom at 105.9 ft bgs, 4-in casing)

Screen Interval – 90.9-105.9 ft bgs Monument: 3.05 ags

Sand Pack Interval – 82.5-105.9 ft bgs (8-in hole) (~13.7 gal/sand pack)

Packer Depth – 81.22 ft bgs (~53 gal/casing vol) (~16.1 gal/packer casing volume)

(~29.9 gal/total well vol below packer)

Sample Description clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
4 – 500 ml, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature]

Date 8/15/2019

Supervisor (signature) [Signature]

Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-6
 Date 8/15/19
 Time Begin Purge 0836
 Time Collect Sample 0900

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
41.21	0841	9.3	6.63	271.2/189.7	0.89	-35.6	9.41
41.21	0846	9.5	6.65	270.1/189.9	0.77	-42.0	4.93
41.22	0851	9.5	6.67	269.1/189.7	0.72	-46.3	3.41
41.22	0856	9.6	6.69	269.2/190.0	0.69	-48.8	1.98
	0900 - collect sample						

Comments:

Grundfos: 180 Htz
 Packer: 110psi

Flow Rate 1.3 gpm

Sampler's Initials R6

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-7-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/14/19 Time 0907

Media Water Station LMW-7

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 225.62 ft below TOC (monument at elev. X) (bottom at 253.7 ft bgs, 4-in casing)

Screen Interval – 239.6-253.7 ft bgs Monument: 3.09 ags

Sand Pack Interval – NA

Packer Depth – NA (~28.3 gal/casing vol) ** Depths corrected for 70° inclination

Sample Description _____

Field Measurements on Sample (pH, conductivity, etc.) _____

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
4 – 500 ml, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature)  Date 8/14/19

Supervisor (signature)  Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-7
 Date 8/14/19
 Time Begin Purge 0819
 Time Collect Sample 0902

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
	0829	12.0	6.75	550/413.9	0.88	8.2	0.70
	0834	12.1	6.99	565/426.9	0.80	-30.3	0.38
	0839	12.2	7.00	582/440.0	0.74	-44.0	41.9
	0844	12.5	6.98	607/466.3	0.70	-51.7	18.1
	0849	12.4	7.01	597/453.3	0.67	-57.3	10.5
	0854	12.4	7.02	601/455.8	0.65	-59.8	7.12
	0859	12.3	7.03	601/455.3	0.64	-60.2	4.26
	0902						

Comments:

Grundfos: 320 Htz → 340 Htz @ 0824 (no production prior)

Flow Rate 1 gpm

* WC tape stuck, dropped to bottom

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-8-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler New Tubing and Peristaltic Pump

Date 8/14/19 Time 1540

Media Water Station LMW-8

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 4.91 01570 ft below TOC (PVC at black notch) (bottom at 13 ft bgs, 2-in casing)

Screen Interval - 8-13 ft bgs PVC stickup: 1.72 ags

Sand Pack Interval - 6-13 ft bgs (8-in hole) (~5.1 gal/sand pack)

Packer Depth - NA (~1.9 gal/casing vol) (~7.0 gal/total well vol)

Sample Description clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl
4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature] Date 8/14/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-8
 Date 8/14/19
 Time Begin Purge 1518
 Time Collect Sample 1540

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
6.82	1523	14.6	6.80	705/565	0.78	-84.0	1.80
7.02	1528	14.6	6.76	714/572	0.68	-86.7	1.25
7.40	1533	14.3	6.78	728/579	0.64	-87.6	1.21
7.52	1538	14.3	6.79	733/582	0.61	-88.3	1.14
<u>1540</u> Sample							

Comments:

Flow Rate 250 mL/min gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-9-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/14/19 Time 1455

Media Water Station LMW-9

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 100.10 ¹⁴³⁰ ft below TOC (PVC at black notch) (bottom at 159 ft bgs, 2-in casing)

Screen Interval - 149-159 ft bgs PVC stickup: 2.86 ags

Sand Pack Interval - 143.5-159 ft bgs (8-in hole) (~11.4 gal/sand pack)

Packer Depth - NA (~10.2 gal/casing vol) (~21.6 gal/total well vol)

Sample Description clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl

4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
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Sampler (signature) [Signature] Date 8/14/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID CMW-9
Date 8/14/19
Time Begin Purge 1430
Time Collect Sample 1455

[illegible]

Comments:

Tank: 130

Throttle: 95

CPM: 2

CID:51

Flow Rate 600 mL/min 9 gpm

Sampler's Initials KL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site

Project No. 923-1000-005.2019

Site Location Ravensdale, WA

Sample ID LMW-10-0819 + LMW-10-0819-D

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/14/19

Time 1205

Media Water

Station LMW-10

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL 8.10 @ 1118 ft below TOC (PVC) (bottom at 289 ft bgs, 4-in casing)

Screen Interval – 267-289 ft bgs PVC stickup: 3.12 ags

Sand Pack Interval – 258-289 ft bgs (9-in hole) (~18.2 gal/sand pack)

Packer Depth – NA (~191 gal/casing vol) (~209 gal/total well vol)

Sample Description Clear, odorless

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
<u>3</u> 6 - 40 mL	VOA	VOA Vial	HCl
<u>2</u> 4 - 500 mL	1,4-Dioxane	Glass Amber	None
<u>4</u> 8 - 500 ml, <u>2</u> 4 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) Ras [Signature]

Date 8/14/19

Supervisor (signature) [Signature]

Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-10
 Date 8/14/19
 Time Begin Purge 1133
 Time Collect Sample 1205

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
0.59	1138	12.2	8.62	386.9/292.0	0.73	-136.6	0.87
1.41	1143	12.1	8.61	386.3/291.2	0.64	-180.6	0.96
1.85	1148	12.1	8.61	386.6/291.4	0.60	-206.6	0.62
2.31	1153	12.1	8.61	386.3/291.4	0.58	-216.3	0.45
2.94	1158	12.2	8.61	386.6/291.9	0.56	-227.4	0.46
_____	1205	- Sample -		_____	_____	_____	_____

Comments:

Tank: 110

Throttle: 40

CPM: 2

CID:50

Flow Rate

~~gpm~~
mL/min

Sampler's Initials RL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-11-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/15/19 Time 1150

Media Water Station LMW-11

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 157.86 ft below TOC (PVC) (bottom at 707 ft bgs, 4-in casing)

Screen Interval – 696-707 ft bgs PVC stickup: 2.70 ags

Sand Pack Interval – 688-707 ft bgs (8-in hole) (~11.2 gal/sand pack)

Packer Depth – NA (~360.4 gal/casing vol) (~371.6 gal/total well vol)

Sample Description clear, odorless

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
4 – 500 ml, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature] Date 8/15/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-11
 Date 8/15/19
 Time Begin Purge 1120
 Time Collect Sample 1150

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
157.95	1125	10.3	7.38	549/395.8	4.60	7.0	4.73
157.99	1130	10.1	7.20	551/394.0	1.61	-41.2	1.77
157.89	1135	10.2	7.19	548/394.2	1.19	-55.3	1.43
157.88	1140	10.4	7.19	548/393.4	1.08	-60.4	0.79
157.89	1145	10.8	7.18	548/401.4	0.96	-66.4	0.93
_____	1150	_____	Sample	_____	_____	_____	_____

Comments:

Tank: 130

Throttle: 110

CPM: 1

CID: 20 14

Flow Rate

450

gpm
mL/min

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-12-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/14/19 Time 1355

Media Water Station LMW-12

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 11.80 @ 1326

Screen Interval - 15-25

Sand Pack Interval - 11-25

Packer Depth - NA

Sample Description Clear, odorless

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl
2 - 500 mL	1,4-Dioxane	Glass Amber	None
4 - 500 mL, 2 - 40 mL	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature] Date 8/14/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID Luw-12
 Date 8/14/19
 Time Begin Purge 1327
 Time Collect Sample 1355

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
11.80	1332	11.7	6.63	956/714	0.74	-81.9	31.4
11.80	1337	11.4	6.63	960/710	0.64	-85.3	26.6
11.80	1342	11.3	6.64	960/710	0.61	-88.1	13.4
11.80	1347	11.4	6.67	983/729	0.59	-90.8	9.36
11.80	1352	11.4	6.71	1024/758	0.58	-93.0	7.09
	1355	collect sample					

Comments:

Tank: 110

Throttle: 20

CPM: 2

CID: 47

Flow Rate

^{JH}
~~575~~
 475

~~gpm~~ mL/min

Sampler's Initials R6

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-13R-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/14/19 Time 1305

Media Water Station LMW-13R

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 12.30 @ 1226

Screen Interval -115-140

Sand Pack Interval -110-150

Packer Depth -NA

Sample Description clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl
2 - 500 mL	1,4-Dioxane	Glass Amber	None
4 - 500 mL, 2 - 40 mL	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [Signature] Date 8/14/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-13R
 Date 8/14/2019
 Time Begin Purge 1230
 Time Collect Sample 1305

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
12.37	1235	13.5	7.34	985/764	2.65	-92.0	0.87
12.40	1240	12.9	7.32	983/756	2.19	-82.1	0.61
12.43	1245	13.0	7.32	982/758	1.87	-104.3	0.86
12.41	1250	13.1	7.32	980/756	1.68	-106.5	0.94
12.45	1255	13.1	7.32	980/759	1.49	-108.8	0.63
12.45	1300	13.2	7.32	979/758	1.34	-111.7	0.35
	1305 - collect sample						

Comments:

Tank: 110

Throttle: 35

CPM: 2

CID: 48

Flow Rate 175 ml/min gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-14-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/15/19 Time 1055

Media Water Station LMW-14

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 166.71 @ 1011 Stickup 2.90' ags

Screen Interval - 156.5-172.3' bgs

Sand Pack Interval - 152.5-175.8' bgs

Packer Depth - NA ** Depths corrected for 75° inclination

Sample Description Clear, no odor

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
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3 - 40 mL	VOA	VOA Vial	HCl
-----------	-----	----------	-----

4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl
-----------------------	----------	-----------------------	-----

Sampler (signature) [Signature] Date 8/15/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-14
 Date 8/15/15
 Time Begin Purge 1015
 Time Collect Sample 1055

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
166.91	1020	10.9	6.60	2054/1500	3.70	-4.7	39.8
167.10	1025	10.6	6.51	2141/1554	0.95	-53.3	9.00
167.09	1030	10.6	6.52	2110/1528	0.82	-57.5	5.81
166.95	1035	10.5	6.54	2133/1544	0.77	-61.9	7.47
166.87	1040	10.5	6.55	2140/1549	0.74	-64.3	8.76
166.88	1045	10.5	6.56	2089/1511	0.71	-64.7	8.70
166.91	1050	10.6	6.56	2057/1489	0.70	-64.6	8.34
	1055	collect sample					

Comments:

Tank: 140

Throttle: 115

CPM: 2 CID:

49

Flow Rate 400ml/min gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-15-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/15/19 Time 1245

Media Water Station LMW-15

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 152.06 @ 1210

Screen Interval -235-245

Sand Pack Interval -231-245

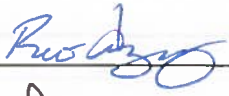
Packer Depth - NA

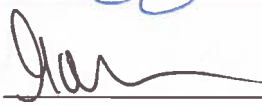
Sample Description

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 - 40 mL	VOA	VOA Vial	HCl
4 - 500 ml, 2 - 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature)  Date 8/15/19

Supervisor (signature)  Date 8-20-19

FIELD PARAMETERS SHEET

Well ID LMW-15
 Date 8/15/19
 Time Begin Purge 1215
 Time Collect Sample 1245

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
152.07	1220	10.4	7.40	492.1/354.1	2.45	-96.1	11.8
152.05	1225	10.4	7.44	494.1/356.4	1.32	-122.1	7.05
152.07	1230	10.2	7.46	499.1/358.3	1.12	-127.9	5.87
152.05	1235	10.2	7.47	499.3/358.7	0.96	-130.9	4.87
152.07	1240	10.1	7.48	501/358.6	0.90	-131.7	6.62
	1245 - collect sample						

Comments:

Tank: 130psi

Throttle: 95psi

CPM: 2

CID:53

Flow Rate 400ml/min gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-FB-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Peristaltic Pump with new tubing

Date 8/15/19 Time 1600

Media Water Station LMW- 4

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

Direct pour lab-provided VOC free water into sample containers.

Sample Description Clear, pristine VOA free DI water

Field Measurements on Sample (pH, conductivity, etc.)

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
2 - 500 mL	1,4-Dioxane	Glass Amber	None

Sampler (signature)  Date 8/15/19

Supervisor (signature)  Date 8-20-19

FIELD PARAMETERS SHEET

Well ID _____

Date 8/15/19

Time Begin Purge _____

Time Collect Sample 1600

[illegible]

Comments:

Sampler's Initials TKG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID LMW-EB-0819

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Peristaltic Pump with new tubing

Date 8/14/19 Time 1600

Media Water Station LMW- 8

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

Pump lab-provided DI water through peristaltic pump

Sample Description

Field Measurements on Sample (pH, conductivity, etc.)

Aliquot Amount	Analysis	Container	Preservation / Amount
<u>3 – 40 mL</u>	<u>VOA</u>	<u>VOA Vial</u>	<u>HCl</u>
<u>4 – 500 ml, 2 – 40 ml</u>	<u>TPH-HCID</u>	<u>Glass Amber, VOA Vial</u>	<u>HCl</u>

Sampler (signature) [Signature] Date 8/14/19

Supervisor (signature) [Signature] Date 8-20-19

FIELD PARAMETERS SHEET

Well ID _____

Date 8/14/19

Time Begin Purge _____

Time Collect Sample 1600

[illegible]

Comments:

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/28/19 Time NA

Media Water Station LMW-2

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 8.70' @ 1332 ft below TOC (monument at elev. X) (bottom at 38.1 ft bgs, 4-in casing)

Screen Interval - 27.9-38.1 ft bgs Monument: 2.94 ags

Sand Pack Interval - 24.8-38.1 ft bgs (8-in hole) (~7.8 gal/sand pack vol)

Packer Depth - NA (~22.3 gal/casing vol) (~30.1 gal/total well vol)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature)  Date 8/28/2019

Supervisor (signature)  Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-2

Date 8/28/2019

Time Begin Purge 1334Time Collect Sample NA[illegible]

Comments:

Grundfos: ~80 Htz

Flow Rate: 0.32 gpm

Sampler's Initials IRG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/28/19 Time NA

Media Water Station LMW-3

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 13.49' ⁰⁹⁵⁰ ft below TOC (monument at elev. X) (bottom at 64.8 ft bgs, 4-in casing)

Screen Interval - 49.8-64.8 ft bgs Monument: 3.08 ags

Sand Pack Interval - 47.1-64.8 ft bgs (8-in hole) (~10.4 gal/sand pack)

Packer Depth - 39.33 ft bgs (~36.1 gal/casing vol) (~16.6 gal/packer casing volume)

(~27.0 gal/total well vol below packer)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature)  Date 8/28/2019

Supervisor (signature)  Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-3

Date 8/28/19

Time Begin Purge 0956

Time Collect Sample NA

[illegible]

Comments:

Grundfos: 135 Htz

Packer: 130psi

Flow Rate 0.83 gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/28/19 Time NA

Media Water Station LMW-4

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 10.86' @ 1240 ft below TOC (monument at elev. X) (bottom at 209.7 ft bgs, 4-in casing)

Screen Interval – 195-209.7 ft bgs Monument: 2.76 ags

Sand Pack Interval – 189-209.7 ft bgs (8-in hole) (~12.3 gal/sand pack)

Packer Depth – 187.3 ft bgs (~133.3 gal/casing vol) (~14.6 gal/packer casing volume)

(~26.9 gal/total well vol below packer)

** Depths corrected for 70° inclination

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/28/19

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMw-4
Date 8/28/19
Time Begin Purge 1245
Time Collect Sample NA

[illegible]

Comments:

Grundfos: 80 Htz

Packer: 110psi

Flow Rate ~ 0.25 gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/28/19 Time NA

Media Water Station LMW-5

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 14.91' @ 1043 ft below TOC (monument at elev. X) (bottom at 241.8 ft bgs, 4-in casing)

Screen Interval - 231.8-241.8 ft bgs Monument: 3.24 ags

Sand Pack Interval - 231.8-241.8 ft bgs (8-in hole) (~5.9 gal/sand pack)

Packer Depth - 222.11 ft bgs (~150.8 gal/casing vol) (~12.9 gal/packer casing volume)

(~18.7 gal/total well vol below packer)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/28/19

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-5
Date 8/28/19
Time Begin Purge 1052
Time Collect Sample NA

[illegible]

Comments:

Grundfos: 135 Htz

Packer: 110psi

Flow Rate 0.5 gpm

Sulfur odor

Sampler's Initials R17

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/28/2019 Time NA

Media Water Station LMW-6

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 42.53 ^{@ 1438} ft below TOC (monument at elev. X) (bottom at 105.9 ft bgs, 4-in casing)

Screen Interval - 90.9-105.9 ft bgs Monument: 3.05 ags

Sand Pack Interval - 82.5-105.9 ft bgs (8-in hole) (~13.7 gal/sand pack)

Packer Depth - 81.22 ft bgs (~53 gal/casing vol) (~16.1 gal/packer casing volume)

(~29.9 gal/total well vol below packer)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/28/2019

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-6
Date 8/28/2019
Time Begin Purge 1441
Time Collect Sample NA

[illegible]

Comments:

Grundfos: 180 Htz

Packer: 110psi

Flow Rate 0.7 gpm

Sampler's Initials KG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated Pump Grundfos

Date 8/28/2019 Time NA

Media Water Station LMW-7

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 225.15 ^{@ 0845} ft below TOC (monument at elev. X) (bottom at 253.7 ft bgs, 4-in casing)

Screen Interval – 239.6-253.7 ft bgs Monument: 3.09 ags

Sand Pack Interval – NA

Packer Depth – NA (~28.3 gal/casing vol) ** Depths corrected for 70° inclination

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/28/2019

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-7Date 8/28/2019

Time Begin Purge 0856

Time Collect Sample NA

[illegible]

Comments:

Grundfos: ~~320 Hz~~ 346

Flow Rate 0.75 gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler New Tubing and Peristaltic Pump

Date 8/27/2019 Time NA

Media Water Station LMW-8

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 4.96 ^{@ 1611} ft below TOC (PVC at black notch) (bottom at 13 ft bgs, 2-in casing)

Screen Interval - 8-13 ft bgs PVC stickup: 1.72 ags

Sand Pack Interval - 6-13 ft bgs (8-in hole) (~5.1 gal/sand pack)

Packer Depth - NA (~1.9 gal/casing vol) (~7.0 gal/total well vol)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/27/2019

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-8

Date 8/27/2019

Time Begin Purge 1621

Time Collect Sample NA[illegible]

Comments:

Flow Rate

SPR

400 mL/min

slowed to 300 mL/min at 1636

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/19 Time NA

Media Water Station LMW-9

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 99.96 ^{@ 1523} ft below TOC (PVC at black notch) (bottom at 159 ft bgs, 2-in casing)

Screen Interval – 149-159 ft bgs PVC stickup: 2.86 ags

Sand Pack Interval – 143.5-159 ft bgs (8-in hole) (~11.4 gal/sand pack)

Packer Depth – NA (~10.2 gal/casing vol) (~21.6 gal/total well vol)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/27/2019

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-9

Date 8/27/2019

Time Begin Purge 1530

Time Collect Sample NA

[illegible]

Comments:

Tank: 130

Throttle: 95

CPM: 2

CID:51

Flow Rate

600 mL/min ~~gpm~~

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/19 Time NA

Media Water Station LMW-10

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL – 0.70 ft below TOC (PVC) (bottom at 289 ft bgs, 4-in casing)

Screen Interval – 267-289 ft bgs PVC stickup: 3.12 ags

Sand Pack Interval – 258-289 ft bgs (9-in hole) (~18.2 gal/sand pack)

Packer Depth – NA (~191 gal/casing vol) (~209 gal/total well vol)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/27/19

Supervisor (signature) [Signature] Date 8-30-19

Well ID LMW-10

Date 8/27/19

Time Begin Purge 1420

Time Collect Sample NA[illegible]

Comments:

Tank: 110

Throttle: 40

CPM: 2

CID:50

Flow Rate *300 mL/min* gpm

Tank: 110

Throttle: 40

CPM: 2

CID:50

Flow Rate

300 mL/min

gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/19 Time NA

Media Water Station LMW-11

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 157.8 ^{@ 12-27} ft below TOC (PVC) (bottom at 707 ft bgs, 4-in casing)

Screen Interval - 696-707 ft bgs PVC stickup: 2.70 ags

Sand Pack Interval - 688-707 ft bgs (8-in hole) (~11.2 gal/sand pack)

Packer Depth - NA (~360.4 gal/casing vol) (~371.6 gal/total well vol)

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature)  Date 8/27/19

Supervisor (signature)  Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-11
 Date 8/27/19
 Time Begin Purge 1230
 Time Collect Sample NA

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
157.83	1240	10.5	7.20	515/372.5	1.57	-55.7	3.61
157.83	1245	10.4	7.19	515/371.8	1.20	-69.4	1.38
157.83	1250	10.4	7.20	514/371.6	1.04	-79.4	0.88
157.83	1255	10.5	7.20	515/371.8	0.96	-86.1	3.91*
157.82	1300	10.5	7.20	515/372.4	0.91	-90.4	1.29

1.49

Comments:

Tank: 130

very slight sulfur odor.

Throttle: 110

* Condensation on turbidity vial

CPM: 1

CID: 20

Flow Rate

400 mL/min
gpm

Sampler's Initials RL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-005.2019

Site Location Ravensdale, WA **Sample ID** No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/2019 **Time** NA

Media Water **Station** LMW-12

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 11.50 bto c @ 0905

Screen Interval - 15-25

Sand Pack Interval - 11-25

Packer Depth - NA

Sample Description _____

Field Measurements on Sample (pH, conductivity, etc.) _____

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount

Sampler (signature)  **Date** 8/27/2019

Supervisor (signature)  **Date** 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-12
 Date 8/27/19
 Time Begin Purge 0906
 Time Collect Sample NA

Water Level feet bmp	Time	Temp. °C	pH	Sp C / Cond uS/cm	DO mg/L	ORP mV	Turbidity NTU
11.51	0911	11.5	6.46	869/645	0.90	-43.1	13.2
11.51	0916	11.4	6.43	842/623	0.75	-59.2	10.5
11.51	0921	11.4	6.44	830/614	0.69	-65.4	7.64
11.51	0925	11.4	6.44	825/610	0.67	-68.2	6.34
11.51	0931	11.3	6.44	822/607	0.65	-70.8	5.15
11.52	0936	11.4	6.44	821/607	0.64	-72.3	4.59

Comments:

Tank: 110

Throttle: 20

CPM: 2

CID: 47

175 mL/min

Flow Rate

~~gpm~~

Sampler's Initials Rh

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/2019 Time NA

Media Water Station LMW-13R

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 12.03 bto c @ 0947

Screen Interval -115-140

Sand Pack Interval -110-150

Packer Depth - NA

Sample Description _____

Field Measurements on Sample (pH, conductivity, etc.) _____

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/27/2019

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-13R
Date 8/27/2019
Time Begin Purge 0950
Time Collect Sample NA

[illegible]

Comments:

Tank: 110

Throttle: 35

CPM: 2

CID: 48

350 mL/min

Flow Rate

gpm

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/19 Time NA

Media Water Station LMW-14

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 166.51 @ 1042 Stickup 2.90' ags

Screen Interval - 156.5-172.3' bgs

Sand Pack Interval - 152.5-175.8' bgs

Packer Depth - NA ** Depths corrected for 75° inclination

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature) [Signature] Date 8/27/19

Supervisor (signature) [Signature] Date 8-30-19

FIELD PARAMETERS SHEET

Well ID 2MW-14

Date 8/27/19

Time Begin Purge 1048

Time Collect Sample NA[illegible]

Comments:

Tank: 140

Throttle: 115

CPM: 2 CID:

49

Flow Rate 450 mL/min ~~gpm~~

Sampler's Initials RG

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site Project No. 923-1000-005.2019

Site Location Ravensdale, WA Sample ID No Sample

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

Technical Procedure Reference(s) TP-1.4-6A, TP-1.2-20, TP-1.2-23

Type of Sampler Dedicated QED Bladder

Date 8/27/19 Time NA

Media Water Station LMW-15

Sample Type: grab time composite space composite

Sample Acquisition Measurements (depth, volume of static well water and purged water, etc.)

SWL - 151.89 @ 1321

Screen Interval -235-245

Sand Pack Interval -231-245

Packer Depth - NA

Sample Description NA

Field Measurements on Sample (pH, conductivity, etc.)

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
----------------	----------	-----------	-----------------------

Sampler (signature)  Date 8/27/19

Supervisor (signature)  Date 8-30-19

FIELD PARAMETERS SHEET

Well ID LMW-15
Date 8/27/19
Time Begin Purge 1325
Time Collect Sample NA

[illegible]

Comments:

Tank: 130psi

Throttle: 95psi

CPM: 2

CID:53 *55* 53

Flow Rate 350 mL/min gpm

Sampler's Initials RG

APPENDIX B

Laboratory Analytical Reports Data
Validation and Quality Assurance /
Quality Control Review
Memorandum and August 2019
Laboratory Analytical Report



Analytical Resources, Incorporated
Analytical Chemists and Consultants

27 August 2019

Gary Zimmerman
Golder Associates
18300 NE Union Hill Road Suite 200
Redmond, WA 98052-3333

RE: Landsburg

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)
19H0256

Associated SDG ID(s)
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.



Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 19H0256		Turn-around Requested: Standard			Page: 1 of 2		 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 Client Company: Golder		Phone: 423-883-0777			Date: 8/14/19				Ice Present? No					
Client Contact: Joseph Xi / Gary Zimmerman					No. of Coolers: 7				Cooler Temps: 5.6, 0.6, 3.8, 2.1, 0.7, 1.3, 2.6					
Client Project Name: Landsburg														
Client Project #: 9231000005/2019		Samplers: Tom Haskins, Reno Gregory			Analysis Requested							Notes/Comments		
Sample ID	Date	Time	Matrix	No. Containers	VOCs	TPH HClD	1,4 Dioxane							Analyze in accordance w/ MSA between Golder and ARI Hold Dx and Grx ↓
LMW-7-0819	8/14/19	0902	W	9	X	X								
LMW-2-0819	8/14/19	1005	↓	11	X	X	X							
LMW-4-0819	8/14/19	1055	↓	11	X	X	X							
LMW-4-0819-D	8/14/19	1100	↓	11	X	X	X							
LMW-10-0819	8/14/19	1205	↓	11	X	X	X							
LMW-12-0819	8/14/19	1355	↓	11	X	X	X							
LMW-13R-0819	8/14/19	1305	↓	11	X	X	X							
LMW-9-0819	8/14/19	1455	↓	9	X	X								
LMW-8-0819	8/14/19	1540	↓	9	X	X								
LMW-EB-0819	8/14/19	1600	↓	9	X	X								
Comments/Special Instructions client specific RL's Ecology EIM EDD cc jcmiller@golder.com		Relinquished by: (Signature) <i>Reno Gregory</i>		Received by: (Signature) <i>[Signature]</i>		Relinquished by: (Signature)		Received by: (Signature)						
		Printed Name: Reno Gregory		Printed Name: ARI		Printed Name:		Printed Name:						
		Company: Golder		Company: ARI		Company:		Company:						
		Date & Time: 8/16/19 0706		Date & Time: 8/16/19 0706		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.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 19H0756		Turn-around Requested: Standard		Page: 2 of 2	
ARI Client Company: Golder		Phone: 423-883-0777		Date: 8/15/19	Ice Present?
Client Contact: Joseph Xi / Gary Zimmerman				No. of Coolers: 7	Cooler Temps: 5.6, 0.6, 3.8, 2.1, 0.7, 1.3, 2.8
Client Project Name: Landsburg				Analysis Requested	
Client Project #: 9231000005/2019		Samplers: Tam Haskins, Reno Gregory		Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	
LMW - 6 - 0819	8/15/19	0900	W	9	
LMW - 14 - 0819	8/15/19	1055		9	
LMW - 11 - 0819	8/15/19	1150		9	
LMW - 15 - 0819	8/15/19	1245		9	
LMW - 3 - 0819	8/15/19	1445		9	
LMW - 5 - 0819	8/15/19	1530		9	
LMW - FB - 0819	8/15/19	1600	↓	5	
Comments/Special Instructions client specific RL's Ecology EIM EDD cc. jcmiller@golder.com		Relinquished by: (Signature) Reno Gregory Printed Name: Reno Gregory Company: Golder Date & Time: 8/16/19 0706		Received by: (Signature) Kenny Dang Printed Name: Kenny Dang Company: ARI Date & Time: 8/16/19 0706	
		Relinquished by: (Signature) Printed Name: Company: Date & Time:		Received by: (Signature) Printed Name: Company: Date & Time:	



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

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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.



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
LMW-7-0819	19H0256-01	Water	14-Aug-2019 09:02	16-Aug-2019 07:06
LMW-2-0819	19H0256-02	Water	14-Aug-2019 10:05	16-Aug-2019 07:06
LMW-4-0819	19H0256-03	Water	14-Aug-2019 10:55	16-Aug-2019 07:06
LMW-4-0819-D	19H0256-04	Water	14-Aug-2019 11:00	16-Aug-2019 07:06
LMW-10-0819	19H0256-05	Water	14-Aug-2019 12:05	16-Aug-2019 07:06
LMW-12-0819	19H0256-06	Water	14-Aug-2019 13:55	16-Aug-2019 07:06
LMW-13R-0819	19H0256-07	Water	14-Aug-2019 13:05	16-Aug-2019 07:06
LMW-9-0819	19H0256-08	Water	14-Aug-2019 14:55	16-Aug-2019 07:06
LMW-8-0819	19H0256-09	Water	14-Aug-2019 15:40	16-Aug-2019 07:06
LMW-EB-0819	19H0256-10	Water	14-Aug-2019 16:00	16-Aug-2019 07:06
LMW-6-0819	19H0256-11	Water	15-Aug-2019 09:00	16-Aug-2019 07:06
LMW-14-0819	19H0256-12	Water	15-Aug-2019 10:55	16-Aug-2019 07:06
LMW-11-0819	19H0256-13	Water	15-Aug-2019 11:50	16-Aug-2019 07:06
LMW-15-0819	19H0256-14	Water	15-Aug-2019 12:45	16-Aug-2019 07:06
LMW-3-0819	19H0256-15	Water	15-Aug-2019 14:45	16-Aug-2019 07:06
LMW-5-0819	19H0256-16	Water	15-Aug-2019 15:30	16-Aug-2019 07:06
LMW-FB-0819	19H0256-17	Water	15-Aug-2019 16:00	16-Aug-2019 07:06
Trip Blanks	19H0256-18	Water	14-Aug-2019 09:02	16-Aug-2019 07:06



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

Work Order Case Narrative

Volatiles - EPA Method SW8260C

The sample(s) were run 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/LCSD percent recoveries and RPD were within control limits.

Hydrocarbon Identification (HCID) - WA-Ecology Method NW-HCID

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

Initial and continuing calibrations were within method requirements.

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.

1,4-Dioxane- EPA Method SW8270D

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.



Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder

Project Name: Landsburg

COC No(s): _____ NA

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

Assigned ARI Job No: 19H0256

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler? _____

YES ☒ NO ☒

Were custody papers included with the cooler? _____

YES ☒ NO ☐

Were custody papers properly filled out (ink, signed, etc.) _____

YES ☒ NO ☐

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

Time 0706

5.6 .6 3.8 2.1 .7 1.3 2.6

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

Temp Gun ID#: DOO 5206

Cooler Accepted by: KD Date: 8/16/19 Time: 0706

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? _____

YES ☒ NO ☐

What kind of packing material was used? _____ Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? _____

NA ☒ YES ☐ NO ☐

How were bottles sealed in plastic bags? _____

Individually ☐ Grouped ☒ Not ☐

Did all bottles arrive in good condition (unbroken)? _____

YES ☒ NO ☐

Were all bottle labels complete and legible? _____

YES ☒ NO ☐

Did the number of containers listed on COC match with the number of containers received? _____

YES ☒ NO ☐

Did all bottle labels and tags agree with custody papers? _____

YES ☒ NO ☐

Were all bottles used correct for the requested analyses? _____

YES ☒ NO ☐

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...

NA ☒ YES ☐ NO ☐

Were all VOC vials free of air bubbles? _____

NA ☒ YES ☐ NO ☐

Was sufficient amount of sample sent in each bottle? _____

YES ☒ NO ☐

Date VOC Trip Blank was made at ARI: _____

NA ☒ YES ☐ NO ☐

Were the sample(s) split by ARI? ☒ NA ☐ YES

Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: WSS Date: 8/17/19 Time: 1124 Labels checked by: WSS

**** 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:

One trip blank had an air bubble, 3 trip blanks included that were not on COC

By: WSS Date: 8/17/19 WSS 8/17/19



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-7-0819
19H0256-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT2 Analyst: LH
Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BHH0598 Sample Size: 10 mL
Prepared: 22-Aug-2019 Final Volume: 10 mL
Extract ID: 19H0256-01 A
Sampled: 08/14/2019 09:02
Analyzed: 08/22/2019 14:21

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-7-0819
19H0256-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 09:02

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:21

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	95.9	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	103	%	



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-7-0819
19H0256-01 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 09:02

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:21

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.2	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	98.3	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	100	%	



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-7-0819
19H0256-01 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 09:02

Analyzed: 08/20/2019 12:54

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-01 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	107	%	
Surrogate: n-Triacontane			50-150 %	127	%	



Golder Associates
18300 NE Union Hill Road Suite 200
Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-2-0819
19H0256-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 10:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:41

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Extract ID: 19H0256-02 B

Preparation Batch: BHH0598

Sample Size: 10 mL

Prepared: 22-Aug-2019

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	0.15	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-2-0819
19H0256-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 10:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:41

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	97.2	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	104	%	



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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-2-0819
19H0256-02 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 10:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:41

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.3	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.2	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-2-0819
19H0256-02 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/14/2019 10:05
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 15:16
Sample Preparation:	Extract ID: 19H0256-02 I 01
Preparation Method: EPA 3520C (Liq Liq)	
Preparation Batch: BHH0455	Sample Size: 500 mL
Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	1.8	ug/L	
Surrogate: 1,4-Dioxane-d8			33.6-120 %	72.7	%	



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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-2-0819
19H0256-02 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 10:05

Analyzed: 08/20/2019 13:15

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-02 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	87.0	%	
Surrogate: n-Triacontane			50-150 %	100	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-4-0819
19H0256-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/14/2019 10:55
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 15:01
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-03 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	0.16	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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LMW-4-0819
19H0256-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 10:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 15:01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	98.0	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	106	%	



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Reported:
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LMW-4-0819
19H0256-03 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 10:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 15:01

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	98.5	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	96.0	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	100	%	



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Reported:
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LMW-4-0819
19H0256-03 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/14/2019 10:55	
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 15:43	
Sample Preparation:	Preparation Method: EPA 3520C (Liq Liq)	Extract ID: 19H0256-03 I 01
	Preparation Batch: BHH0455	Sample Size: 500 mL
	Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	1.5	ug/L	
Surrogate: 1,4-Dioxane-d8			33.6-120 %	59.6	%	



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Reported:
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LMW-4-0819
19H0256-03 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 10:55

Analyzed: 08/20/2019 13:37

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-03 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	93.6	%	
Surrogate: n-Triacontane			50-150 %	111	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-4-0819-D
19H0256-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT2 Analyst: LH
Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BHH0598 Sample Size: 10 mL
Prepared: 22-Aug-2019 Final Volume: 10 mL
Extract ID: 19H0256-04 A
Sampled: 08/14/2019 11:00
Analyzed: 08/22/2019 15:22

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	0.14	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-4-0819-D
19H0256-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 11:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 15:22

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	98.1	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	105	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-4-0819-D
19H0256-04 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 11:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 15:22

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.6	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	98.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-4-0819-D
19H0256-04 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/14/2019 11:00	
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 16:11	
Sample Preparation:	Preparation Method: EPA 3520C (Liq Liq)	Extract ID: 19H0256-04 I 01
	Preparation Batch: BHH0455	Sample Size: 500 mL
	Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	1.6	ug/L	
Surrogate: 1,4-Dioxane-d8			33.6-120 %	64.0	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-4-0819-D
19H0256-04 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 11:00

Analyzed: 08/20/2019 13:58

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-04 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	69.9	%	
Surrogate: n-Triacontane			50-150 %	86.2	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-10-0819
19H0256-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C		Sampled: 08/14/2019 12:05
Instrument: NT2 Analyst: LH		Analyzed: 08/22/2019 15:42
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)	Extract ID: 19H0256-05 A
	Preparation Batch: BHH0598	Sample Size: 10 mL
	Prepared: 22-Aug-2019	Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	0.28	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-10-0819
19H0256-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 12:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 15:42

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	98.5	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	106	%	



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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-10-0819
19H0256-05 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 12:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 15:42

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.3	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	96.5	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	99.9	%	



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Reported:
27-Aug-2019 15:02

LMW-10-0819
19H0256-05 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/14/2019 12:05	
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 16:38	
Sample Preparation:	Preparation Method: EPA 3520C (Liq Liq)	Extract ID: 19H0256-05 I 01
	Preparation Batch: BHH0455	Sample Size: 500 mL
	Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	ND	ug/L	U
Surrogate: 1,4-Dioxane-d8			33.6-120 %	67.7	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-10-0819
19H0256-05 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 12:05

Analyzed: 08/20/2019 14:20

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-05 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	97.5	%	
Surrogate: n-Triacontane			50-150 %	113	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-12-0819
19H0256-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 13:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:02

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Extract ID: 19H0256-06 B

Preparation Batch: BHH0598

Sample Size: 10 mL

Prepared: 22-Aug-2019

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	0.44	ug/L	
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-12-0819
19H0256-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 13:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:02

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	97.0	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	106	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-12-0819
19H0256-06 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 13:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:02

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	96.5	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-12-0819
19H0256-06 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/14/2019 13:55	
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 17:05	
Sample Preparation:	Preparation Method: EPA 3520C (Liq Liq)	Extract ID: 19H0256-06 I 01
	Preparation Batch: BHH0455	Sample Size: 500 mL
	Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	1.6	ug/L	
Surrogate: 1,4-Dioxane-d8			33.6-120 %	71.1	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-12-0819
19H0256-06 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 13:55

Analyzed: 08/20/2019 14:41

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-06 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	99.4	%	
Surrogate: n-Triacontane			50-150 %	107	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-13R-0819
19H0256-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 13:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:23

Sample Preparation:

Preparation Method: EPA 5030 (Purge and Trap)

Extract ID: 19H0256-07 A

Preparation Batch: BHH0598

Sample Size: 10 mL

Prepared: 22-Aug-2019

Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	0.12	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Manager: Gary Zimmerman

Reported:
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LMW-13R-0819
19H0256-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 13:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:23

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	97.9	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	105	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-13R-0819
19H0256-07 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 13:05

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:23

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	96.2	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Project Manager: Gary Zimmerman

Reported:
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LMW-13R-0819
19H0256-07 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/14/2019 13:05	
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 17:32	
Sample Preparation:	Preparation Method: EPA 3520C (Liq Liq)	Extract ID: 19H0256-07 I 01
	Preparation Batch: BHH0455	Sample Size: 500 mL
	Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	ND	ug/L	U
Surrogate: 1,4-Dioxane-d8			33.6-120 %	65.2	%	



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Project: Landsburg
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Reported:
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LMW-13R-0819
19H0256-07 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 13:05

Analyzed: 08/20/2019 15:03

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-07 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	92.0	%	
Surrogate: n-Triacontane			50-150 %	102	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-9-0819
19H0256-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C
Instrument: NT2 Analyst: LH
Sample Preparation: Preparation Method: EPA 5030 (Purge and Trap)
Preparation Batch: BHH0598 Sample Size: 10 mL
Prepared: 22-Aug-2019 Final Volume: 10 mL
Extract ID: 19H0256-08 A
Sampled: 08/14/2019 14:55
Analyzed: 08/22/2019 16:43

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project Manager: Gary Zimmerman

Reported:
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LMW-9-0819
19H0256-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 14:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:43

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	101	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	109	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-9-0819
19H0256-08 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 14:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 16:43

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	98.2	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	94.8	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
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LMW-9-0819
19H0256-08 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 14:55

Analyzed: 08/20/2019 15:25

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-08 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	110	%	
Surrogate: n-Triacontane			50-150 %	129	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-8-0819
19H0256-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/14/2019 15:40
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 17:03
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-09 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-8-0819
19H0256-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 15:40

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 17:03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	97.5	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	108	%	



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Project Manager: Gary Zimmerman

Reported:
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LMW-8-0819
19H0256-09 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 15:40

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 17:03

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.4	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	99.7	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-8-0819
19H0256-09 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 15:40

Analyzed: 08/20/2019 15:47

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-09 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	108	%	
Surrogate: n-Triacontane			50-150 %	114	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-EB-0819
19H0256-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/14/2019 16:00
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 17:23
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-10 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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LMW-EB-0819
19H0256-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 16:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 17:23

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	98.1	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	111	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-EB-0819
19H0256-10 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 16:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 17:23

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.1	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
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LMW-EB-0819
19H0256-10 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/14/2019 16:00

Analyzed: 08/20/2019 16:08

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-10 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	101	%	
Surrogate: n-Triacontane			50-150 %	117	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-6-0819
19H0256-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 09:00
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 17:44
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-11 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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LMW-6-0819
19H0256-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 09:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 17:44

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	98.0	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	110	%	



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-6-0819
19H0256-11 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 09:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 17:44

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	96.8	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	104	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-6-0819
19H0256-11 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/15/2019 09:00

Analyzed: 08/20/2019 16:30

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-11 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	103	%	
Surrogate: n-Triacontane			50-150 %	117	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-14-0819
19H0256-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 10:55
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 18:04
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-12 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	0.27	ug/L	
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	0.57	ug/L	
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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LMW-14-0819
19H0256-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 10:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 18:04

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	0.26	ug/L	
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	95.7	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	109	%	



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Reported:
27-Aug-2019 15:02

LMW-14-0819
19H0256-12 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 10:55

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 18:04

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.1	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	94.5	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
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LMW-14-0819
19H0256-12 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/15/2019 10:55

Analyzed: 08/20/2019 16:51

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-12 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	103	%	
Surrogate: n-Triacontane			50-150 %	110	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-11-0819
19H0256-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 11:50
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 18:25
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-13 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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LMW-11-0819
19H0256-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 11:50

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 18:25

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	99.7	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	111	%	



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Reported:
27-Aug-2019 15:02

LMW-11-0819
19H0256-13 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 11:50

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 18:25

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.0	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	93.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	104	%	



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LMW-11-0819
19H0256-13 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID

Sampled: 08/15/2019 11:50

Instrument: FID4 Analyst: WMT

Analyzed: 08/20/2019 17:13

Sample Preparation:

Preparation Method: EPA 3510C SepF

Extract ID: 19H0256-13 H 01

Preparation Batch: BHH0444

Sample Size: 500 mL

Prepared: 19-Aug-2019

Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	104	%	
Surrogate: n-Triacontane			50-150 %	116	%	



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Reported:
27-Aug-2019 15:02

LMW-15-0819
19H0256-14 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 12:45
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 18:46
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-14 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	0.82	ug/L	
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Redmond WA, 98052-3333

Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-15-0819
19H0256-14 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 12:45

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 18:46

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	96.9	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	109	%	



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Project: Landsburg
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Reported:
27-Aug-2019 15:02

LMW-15-0819
19H0256-14 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 12:45

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 18:46

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.5	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.5	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-15-0819
19H0256-14 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/15/2019 12:45

Analyzed: 08/20/2019 17:35

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-14 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	107	%	
Surrogate: n-Triacontane			50-150 %	121	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-3-0819
19H0256-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 14:45
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 19:06
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-15 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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LMW-3-0819
19H0256-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 14:45

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 19:06

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	99.0	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	111	%	



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LMW-3-0819
19H0256-15 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 14:45

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 19:06

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	98.0	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	92.7	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	104	%	



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Reported:
27-Aug-2019 15:02

LMW-3-0819
19H0256-15 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/15/2019 14:45

Analyzed: 08/20/2019 17:57

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-15 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	104	%	
Surrogate: n-Triacontane			50-150 %	116	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-5-0819
19H0256-16 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 15:30
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 19:26
Sample Preparation:	Extract ID: 19H0256-16 A
Preparation Method: EPA 5030 (Purge and Trap)	
Preparation Batch: BHH0598	Sample Size: 10 mL
Prepared: 22-Aug-2019	Final Volume: 10 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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LMW-5-0819
19H0256-16 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 15:30

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 19:26

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	98.0	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	112	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-5-0819
19H0256-16 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 15:30

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 19:26

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.2	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	91.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-5-0819
19H0256-16 (Water)

Petroleum Hydrocarbons

Method: NWTPH-HCID
Instrument: FID4 Analyst: WMT

Sampled: 08/15/2019 15:30

Analyzed: 08/20/2019 18:18

Sample Preparation: Preparation Method: EPA 3510C SepF
Preparation Batch: BHH0444 Sample Size: 500 mL
Prepared: 19-Aug-2019 Final Volume: 1 mL

Extract ID: 19H0256-16 H 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Gasoline Range Organics (Tol-C12)	GRO	1	0.25	ND	mg/L	U
Diesel Range Organics (C12-C24)	DRO	1	0.50	ND	mg/L	U
Motor Oil Range Organics (C24-C38)	RRO	1	1.00	ND	mg/L	U
Surrogate: o-Terphenyl			50-150 %	110	%	
Surrogate: n-Triacontane			50-150 %	118	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

LMW-FB-0819
19H0256-17 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/15/2019 16:00
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 13:40
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-17 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
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LMW-FB-0819
19H0256-17 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 16:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 13:40

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	96.8	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	102	%	



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Project Number: Landsburg
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Reported:
27-Aug-2019 15:02

LMW-FB-0819
19H0256-17 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/15/2019 16:00

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 13:40

Analyte	CAS Number	Recovery	Recovery	Units	Notes
		Limits			
Surrogate: Toluene-d8		80-120 %	97.7	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	95.6	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	101	%	



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Reported:
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LMW-FB-0819
19H0256-17 (Water)

Semivolatile Organic Compounds - SIM

Method: EPA 8270D-SIM	Sampled: 08/15/2019 16:00	
Instrument: NT12 Analyst: JZ	Analyzed: 08/26/2019 17:59	
Sample Preparation:	Preparation Method: EPA 3520C (Liq Liq)	Extract ID: 19H0256-17 D 01
	Preparation Batch: BHH0455	Sample Size: 500 mL
	Prepared: 19-Aug-2019	Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	ND	ug/L	U
Surrogate: 1,4-Dioxane-d8			33.6-120 %	64.3	%	



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

Trip Blanks
19H0256-18 (Water)

Volatile Organic Compounds

Method: EPA 8260C	Sampled: 08/14/2019 09:02
Instrument: NT2 Analyst: LH	Analyzed: 08/22/2019 14:00
Sample Preparation:	Preparation Method: EPA 5030 (Purge and Trap)
	Preparation Batch: BHH0598
	Sample Size: 10 mL
	Final Volume: 10 mL
	Extract ID: 19H0256-18 A

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Chloromethane	74-87-3	1	0.50	ND	ug/L	U
Vinyl Chloride	75-01-4	1	0.10	ND	ug/L	U
Bromomethane	74-83-9	1	1.00	ND	ug/L	U
Chloroethane	75-00-3	1	0.20	ND	ug/L	U
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	2.50	ND	ug/L	U
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	1	0.20	ND	ug/L	U
Acetone	67-64-1	1	5.00	ND	ug/L	U
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Bromoethane	74-96-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	0.50	ND	ug/L	U
Methylene Chloride	75-09-2	1	1.00	ND	ug/L	U
Acrylonitrile	107-13-1	1	1.00	ND	ug/L	U
Carbon Disulfide	75-15-0	1	0.10	ND	ug/L	U
trans-1,2-Dichloroethene	156-60-5	1	0.20	ND	ug/L	U
Vinyl Acetate	108-05-4	1	0.20	ND	ug/L	U
1,1-Dichloroethane	75-34-3	1	0.20	ND	ug/L	U
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.10	ND	ug/L	U
cis-1,2-Dichloroethene	156-59-2	1	0.20	ND	ug/L	U
Chloroform	67-66-3	1	0.20	ND	ug/L	U
Bromochloromethane	74-97-5	1	0.20	ND	ug/L	U
1,1,1-Trichloroethane	71-55-6	1	0.20	ND	ug/L	U
1,1-Dichloropropene	563-58-6	1	0.10	ND	ug/L	U
Carbon tetrachloride	56-23-5	1	0.20	ND	ug/L	U
1,2-Dichloroethane	107-06-2	1	0.20	ND	ug/L	U
Benzene	71-43-2	1	0.20	ND	ug/L	U
Trichloroethene	79-01-6	1	0.20	ND	ug/L	U
1,2-Dichloropropane	78-87-5	1	0.20	ND	ug/L	U
Bromodichloromethane	75-27-4	1	0.20	ND	ug/L	U
Dibromomethane	74-95-3	1	0.20	ND	ug/L	U
2-Chloroethyl vinyl ether	110-75-8	1	0.50	ND	ug/L	U
4-Methyl-2-Pentanone	108-10-1	1	2.50	ND	ug/L	U
cis-1,3-Dichloropropene	10061-01-5	1	0.20	ND	ug/L	U
Toluene	108-88-3	1	0.20	ND	ug/L	U
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U



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Reported:
27-Aug-2019 15:02

Trip Blanks
19H0256-18 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 09:02

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:00

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
2-Hexanone	591-78-6	1	5.00	ND	ug/L	U
1,1,2-Trichloroethane	79-00-5	1	0.20	ND	ug/L	U
1,3-Dichloropropane	142-28-9	1	0.10	ND	ug/L	U
Tetrachloroethene	127-18-4	1	0.20	ND	ug/L	U
Dibromochloromethane	124-48-1	1	0.20	ND	ug/L	U
1,2-Dibromoethane	106-93-4	1	0.10	ND	ug/L	U
Chlorobenzene	108-90-7	1	0.20	ND	ug/L	U
Ethylbenzene	100-41-4	1	0.20	ND	ug/L	U
1,1,1,2-Tetrachloroethane	630-20-6	1	0.20	ND	ug/L	U
m,p-Xylene	179601-23-1	1	0.40	ND	ug/L	U
o-Xylene	95-47-6	1	0.20	ND	ug/L	U
Xylenes, total	1330-20-7	1	0.60	ND	ug/L	U
Styrene	100-42-5	1	0.20	ND	ug/L	U
Bromoform	75-25-2	1	0.20	ND	ug/L	U
1,1,2,2-Tetrachloroethane	79-34-5	1	0.10	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.20	ND	ug/L	U
trans-1,4-Dichloro 2-Butene	110-57-6	1	1.00	ND	ug/L	U
n-Propylbenzene	103-65-1	1	0.20	ND	ug/L	U
Bromobenzene	108-86-1	1	0.20	ND	ug/L	U
Isopropyl Benzene	98-82-8	1	0.20	ND	ug/L	U
2-Chlorotoluene	95-49-8	1	0.10	ND	ug/L	U
4-Chlorotoluene	106-43-4	1	0.20	ND	ug/L	U
t-Butylbenzene	98-06-6	1	0.20	ND	ug/L	U
1,3,5-Trimethylbenzene	108-67-8	1	0.20	ND	ug/L	U
1,2,4-Trimethylbenzene	95-63-6	1	0.20	ND	ug/L	U
s-Butylbenzene	135-98-8	1	0.20	ND	ug/L	U
4-Isopropyl Toluene	99-87-6	1	0.20	ND	ug/L	U
1,3-Dichlorobenzene	541-73-1	1	0.20	ND	ug/L	U
1,4-Dichlorobenzene	106-46-7	1	0.20	ND	ug/L	U
n-Butylbenzene	104-51-8	1	0.20	ND	ug/L	U
1,2-Dichlorobenzene	95-50-1	1	0.20	ND	ug/L	U
1,2-Dibromo-3-chloropropane	96-12-8	1	0.50	ND	ug/L	U
1,2,4-Trichlorobenzene	120-82-1	1	0.50	ND	ug/L	U
Hexachloro-1,3-Butadiene	87-68-3	1	0.20	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.20	ND	ug/L	U
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
Surrogate: Dibromofluoromethane			80-120 %	96.8	%	
Surrogate: 1,2-Dichloroethane-d4			80-129 %	103	%	



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Project: Landsburg
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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

Trip Blanks
19H0256-18 (Water)

Volatile Organic Compounds

Method: EPA 8260C

Sampled: 08/14/2019 09:02

Instrument: NT2 Analyst: LH

Analyzed: 08/22/2019 14:00

Analyte	CAS Number	Recovery Limits	Recovery	Units	Notes
Surrogate: Toluene-d8		80-120 %	98.9	%	
Surrogate: 4-Bromofluorobenzene		80-120 %	96.5	%	
Surrogate: 1,2-Dichlorobenzene-d4		80-120 %	102	%	



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Reported:
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Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHH0598-BLK1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 13:20								
Chloromethane	ND	0.50	ug/L							U
Vinyl Chloride	ND	0.10	ug/L							U
Bromomethane	ND	1.00	ug/L							U
Chloroethane	ND	0.20	ug/L							U
Trichlorofluoromethane	ND	0.20	ug/L							U
Acrolein	ND	2.50	ug/L							U
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.20	ug/L							U
Acetone	ND	5.00	ug/L							U
1,1-Dichloroethene	ND	0.20	ug/L							U
Bromoethane	ND	0.20	ug/L							U
Iodomethane	ND	0.50	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.10	ug/L							U
trans-1,2-Dichloroethene	ND	0.20	ug/L							U
Vinyl Acetate	ND	0.20	ug/L							U
1,1-Dichloroethane	ND	0.20	ug/L							U
2-Butanone	ND	5.00	ug/L							U
2,2-Dichloropropane	ND	0.10	ug/L							U
cis-1,2-Dichloroethene	ND	0.20	ug/L							U
Chloroform	ND	0.20	ug/L							U
Bromochloromethane	ND	0.20	ug/L							U
1,1,1-Trichloroethane	ND	0.20	ug/L							U
1,1-Dichloropropene	ND	0.10	ug/L							U
Carbon tetrachloride	ND	0.20	ug/L							U
1,2-Dichloroethane	ND	0.20	ug/L							U
Benzene	ND	0.20	ug/L							U
Trichloroethene	ND	0.20	ug/L							U
1,2-Dichloropropane	ND	0.20	ug/L							U
Bromodichloromethane	ND	0.20	ug/L							U
Dibromomethane	ND	0.20	ug/L							U
2-Chloroethyl vinyl ether	ND	0.50	ug/L							U
4-Methyl-2-Pentanone	ND	2.50	ug/L							U
cis-1,3-Dichloropropene	ND	0.20	ug/L							U
Toluene	ND	0.20	ug/L							U



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Reported:
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Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHH0598-BLK1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 13:20								
trans-1,3-Dichloropropene	ND	0.20	ug/L							U
2-Hexanone	ND	5.00	ug/L							U
1,1,2-Trichloroethane	ND	0.20	ug/L							U
1,3-Dichloropropane	ND	0.10	ug/L							U
Tetrachloroethene	ND	0.20	ug/L							U
Dibromochloromethane	ND	0.20	ug/L							U
1,2-Dibromoethane	ND	0.10	ug/L							U
Chlorobenzene	ND	0.20	ug/L							U
Ethylbenzene	ND	0.20	ug/L							U
1,1,1,2-Tetrachloroethane	ND	0.20	ug/L							U
m,p-Xylene	ND	0.40	ug/L							U
o-Xylene	ND	0.20	ug/L							U
Xylenes, total	ND	0.60	ug/L							U
Styrene	ND	0.20	ug/L							U
Bromoform	ND	0.20	ug/L							U
1,1,2,2-Tetrachloroethane	ND	0.10	ug/L							U
1,2,3-Trichloropropane	ND	0.20	ug/L							U
trans-1,4-Dichloro 2-Butene	ND	1.00	ug/L							U
n-Propylbenzene	ND	0.20	ug/L							U
Bromobenzene	ND	0.20	ug/L							U
Isopropyl Benzene	ND	0.20	ug/L							U
2-Chlorotoluene	ND	0.10	ug/L							U
4-Chlorotoluene	ND	0.20	ug/L							U
t-Butylbenzene	ND	0.20	ug/L							U
1,3,5-Trimethylbenzene	ND	0.20	ug/L							U
1,2,4-Trimethylbenzene	ND	0.20	ug/L							U
s-Butylbenzene	ND	0.20	ug/L							U
4-Isopropyl Toluene	ND	0.20	ug/L							U
1,3-Dichlorobenzene	ND	0.20	ug/L							U
1,4-Dichlorobenzene	ND	0.20	ug/L							U
n-Butylbenzene	ND	0.20	ug/L							U
1,2-Dichlorobenzene	ND	0.20	ug/L							U
1,2-Dibromo-3-chloropropane	ND	0.50	ug/L							U
1,2,4-Trichlorobenzene	ND	0.50	ug/L							U
Hexachloro-1,3-Butadiene	ND	0.20	ug/L							U



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Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BHH0598-BLK1)										
Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 13:20										
Naphthalene	ND	0.50	ug/L							U
1,2,3-Trichlorobenzene	ND	0.20	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
Surrogate: Dibromofluoromethane	4.83		ug/L	5.00		96.7	80-120			
Surrogate: 1,2-Dichloroethane-d4	5.11		ug/L	5.00		102	80-129			
Surrogate: Toluene-d8	4.85		ug/L	5.00		96.9	80-120			
Surrogate: 4-Bromofluorobenzene	4.89		ug/L	5.00		97.7	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.12		ug/L	5.00		102	80-120			
LCS (BHH0598-BS1)										
Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 12:19										
Chloromethane	10.6	0.50	ug/L	10.0		106	60-138			
Vinyl Chloride	10.2	0.10	ug/L	10.0		102	66-133			
Bromomethane	10.5	1.00	ug/L	10.0		105	72-131			
Chloroethane	10.9	0.20	ug/L	10.0		109	60-155			
Trichlorofluoromethane	11.0	0.20	ug/L	10.0		110	80-129			
Acrolein	52.6	2.50	ug/L	50.0		105	52-144			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.4	0.20	ug/L	10.0		104	76-129			
Acetone	51.9	5.00	ug/L	50.0		104	58-142			
1,1-Dichloroethene	10.6	0.20	ug/L	10.0		106	69-135			
Bromoethane	10.6	0.20	ug/L	10.0		106	78-128			
Iodomethane	10.3	0.50	ug/L	10.0		103	56-147			
Methylene Chloride	10.8	1.00	ug/L	10.0		108	65-135			
Acrylonitrile	10.5	1.00	ug/L	10.0		105	64-134			
Carbon Disulfide	10.7	0.10	ug/L	10.0		107	78-125			
trans-1,2-Dichloroethene	10.3	0.20	ug/L	10.0		103	78-128			
Vinyl Acetate	11.2	0.20	ug/L	10.0		112	55-138			
1,1-Dichloroethane	10.3	0.20	ug/L	10.0		103	76-124			
2-Butanone	53.8	5.00	ug/L	50.0		108	61-140			
2,2-Dichloropropane	9.84	0.10	ug/L	10.0		98.4	78-125			
cis-1,2-Dichloroethene	10.3	0.20	ug/L	10.0		103	80-121			
Chloroform	10.3	0.20	ug/L	10.0		103	80-122			
Bromochloromethane	10.5	0.20	ug/L	10.0		105	80-121			
1,1,1-Trichloroethane	10.7	0.20	ug/L	10.0		107	79-123			
1,1-Dichloropropene	10.9	0.10	ug/L	10.0		109	80-120			
Carbon tetrachloride	11.2	0.20	ug/L	10.0		112	53-137			



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Project: Landsburg
Project Number: Landsburg
Project Manager: Gary Zimmerman

Reported:
27-Aug-2019 15:02

Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BHH0598-BS1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 12:19								
1,2-Dichloroethane	10.1	0.20	ug/L	10.0		101	75-123			
Benzene	10.7	0.20	ug/L	10.0		107	80-120			
Trichloroethene	10.3	0.20	ug/L	10.0		103	80-120			
1,2-Dichloropropane	10.5	0.20	ug/L	10.0		105	80-120			
Bromodichloromethane	11.2	0.20	ug/L	10.0		112	80-121			
Dibromomethane	10.5	0.20	ug/L	10.0		105	80-120			
2-Chloroethyl vinyl ether	9.87	0.50	ug/L	10.0		98.7	74-127			
4-Methyl-2-Pentanone	58.0	2.50	ug/L	50.0		116	67-133			
cis-1,3-Dichloropropene	10.3	0.20	ug/L	10.0		103	80-124			
Toluene	10.5	0.20	ug/L	10.0		105	80-120			
trans-1,3-Dichloropropene	9.91	0.20	ug/L	10.0		99.1	71-127			
2-Hexanone	56.4	5.00	ug/L	50.0		113	69-133			
1,1,2-Trichloroethane	10.7	0.20	ug/L	10.0		107	80-121			
1,3-Dichloropropane	10.6	0.10	ug/L	10.0		106	80-120			
Tetrachloroethene	10.1	0.20	ug/L	10.0		101	80-120			
Dibromochloromethane	8.87	0.20	ug/L	10.0		88.7	65-135			
1,2-Dibromoethane	11.1	0.10	ug/L	10.0		111	80-121			
Chlorobenzene	10.5	0.20	ug/L	10.0		105	80-120			
Ethylbenzene	10.7	0.20	ug/L	10.0		107	80-120			
1,1,1,2-Tetrachloroethane	11.5	0.20	ug/L	10.0		115	80-120			
m,p-Xylene	22.3	0.40	ug/L	20.0		112	80-121			
o-Xylene	11.0	0.20	ug/L	10.0		110	80-121			
Xylenes, total	33.4	0.60	ug/L	30.0		111	76-127			
Styrene	11.7	0.20	ug/L	10.0		117	80-124			
Bromoform	8.13	0.20	ug/L	10.0		81.3	51-134			
1,1,2,2-Tetrachloroethane	11.7	0.10	ug/L	10.0		117	77-123			
1,2,3-Trichloropropane	11.4	0.20	ug/L	10.0		114	76-125			
trans-1,4-Dichloro 2-Butene	10.4	1.00	ug/L	10.0		104	55-129			
n-Propylbenzene	11.3	0.20	ug/L	10.0		113	78-130			
Bromobenzene	10.8	0.20	ug/L	10.0		108	80-120			
Isopropyl Benzene	11.4	0.20	ug/L	10.0		114	80-128			
2-Chlorotoluene	10.3	0.10	ug/L	10.0		103	78-122			
4-Chlorotoluene	10.9	0.20	ug/L	10.0		109	80-121			
t-Butylbenzene	11.3	0.20	ug/L	10.0		113	78-125			
1,3,5-Trimethylbenzene	11.6	0.20	ug/L	10.0		116	80-129			



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Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BHH0598-BS1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 12:19								
1,2,4-Trimethylbenzene	11.3	0.20	ug/L	10.0		113	80-127			
s-Butylbenzene	11.3	0.20	ug/L	10.0		113	78-129			
4-Isopropyl Toluene	11.5	0.20	ug/L	10.0		115	79-130			
1,3-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120			
1,4-Dichlorobenzene	10.4	0.20	ug/L	10.0		104	80-120			
n-Butylbenzene	11.1	0.20	ug/L	10.0		111	74-129			
1,2-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120			
1,2-Dibromo-3-chloropropane	8.46	0.50	ug/L	10.0		84.6	62-123			
1,2,4-Trichlorobenzene	11.1	0.50	ug/L	10.0		111	64-124			
Hexachloro-1,3-Butadiene	10.8	0.20	ug/L	10.0		108	58-123			
Naphthalene	10.8	0.50	ug/L	10.0		108	50-134			
1,2,3-Trichlorobenzene	11.4	0.20	ug/L	10.0		114	49-133			
Dichlorodifluoromethane	10.4	0.20	ug/L	10.0		104	48-147			
Surrogate: Dibromofluoromethane	5.03		ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichloroethane-d4	5.01		ug/L	5.00		100	80-129			
Surrogate: Toluene-d8	5.07		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.03		ug/L	5.00		101	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.15		ug/L	5.00		103	80-120			
LCS Dup (BHH0598-BS1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 12:39								
Chloromethane	10.7	0.50	ug/L	10.0		107	60-138	0.63	30	
Vinyl Chloride	10.5	0.10	ug/L	10.0		105	66-133	3.18	30	
Bromomethane	10.7	1.00	ug/L	10.0		107	72-131	2.26	30	
Chloroethane	11.4	0.20	ug/L	10.0		114	60-155	4.22	30	
Trichlorofluoromethane	10.9	0.20	ug/L	10.0		109	80-129	0.44	30	
Acrolein	53.3	2.50	ug/L	50.0		107	52-144	1.31	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.5	0.20	ug/L	10.0		105	76-129	0.68	30	
Acetone	52.3	5.00	ug/L	50.0		105	58-142	0.73	30	
1,1-Dichloroethene	10.5	0.20	ug/L	10.0		105	69-135	1.04	30	
Bromoethane	10.7	0.20	ug/L	10.0		107	78-128	0.37	30	
Iodomethane	10.3	0.50	ug/L	10.0		103	56-147	0.74	30	
Methylene Chloride	10.8	1.00	ug/L	10.0		108	65-135	0.04	30	
Acrylonitrile	10.7	1.00	ug/L	10.0		107	64-134	2.05	30	
Carbon Disulfide	10.7	0.10	ug/L	10.0		107	78-125	0.07	30	
trans-1,2-Dichloroethene	10.1	0.20	ug/L	10.0		101	78-128	1.75	30	



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Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BHH0598-BSD1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 12:39								
Vinyl Acetate	11.2	0.20	ug/L	10.0		112	55-138	0.74	30	
1,1-Dichloroethane	9.99	0.20	ug/L	10.0		99.9	76-124	3.19	30	
2-Butanone	54.5	5.00	ug/L	50.0		109	61-140	1.26	30	
2,2-Dichloropropane	9.60	0.10	ug/L	10.0		96.0	78-125	2.42	30	
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121	1.20	30	
Chloroform	10.2	0.20	ug/L	10.0		102	80-122	0.80	30	
Bromochloromethane	10.4	0.20	ug/L	10.0		104	80-121	1.46	30	
1,1,1-Trichloroethane	10.6	0.20	ug/L	10.0		106	79-123	1.25	30	
1,1-Dichloropropene	10.8	0.10	ug/L	10.0		108	80-120	0.58	30	
Carbon tetrachloride	11.2	0.20	ug/L	10.0		112	53-137	0.18	30	
1,2-Dichloroethane	10.2	0.20	ug/L	10.0		102	75-123	1.33	30	
Benzene	10.6	0.20	ug/L	10.0		106	80-120	1.15	30	
Trichloroethene	10.3	0.20	ug/L	10.0		103	80-120	0.43	30	
1,2-Dichloropropane	10.4	0.20	ug/L	10.0		104	80-120	1.20	30	
Bromodichloromethane	11.1	0.20	ug/L	10.0		111	80-121	0.84	30	
Dibromomethane	10.6	0.20	ug/L	10.0		106	80-120	0.51	30	
2-Chloroethyl vinyl ether	9.73	0.50	ug/L	10.0		97.3	74-127	1.48	30	
4-Methyl-2-Pentanone	58.6	2.50	ug/L	50.0		117	67-133	0.97	30	
cis-1,3-Dichloropropene	10.1	0.20	ug/L	10.0		101	80-124	1.65	30	
Toluene	10.5	0.20	ug/L	10.0		105	80-120	0.34	30	
trans-1,3-Dichloropropene	9.98	0.20	ug/L	10.0		99.8	71-127	0.71	30	
2-Hexanone	56.6	5.00	ug/L	50.0		113	69-133	0.44	30	
1,1,2-Trichloroethane	10.6	0.20	ug/L	10.0		106	80-121	0.89	30	
1,3-Dichloropropane	10.6	0.10	ug/L	10.0		106	80-120	0.55	30	
Tetrachloroethene	9.94	0.20	ug/L	10.0		99.4	80-120	1.81	30	
Dibromochloromethane	8.75	0.20	ug/L	10.0		87.5	65-135	1.34	30	
1,2-Dibromoethane	11.1	0.10	ug/L	10.0		111	80-121	0.56	30	
Chlorobenzene	10.4	0.20	ug/L	10.0		104	80-120	1.38	30	
Ethylbenzene	10.5	0.20	ug/L	10.0		105	80-120	2.14	30	
1,1,1,2-Tetrachloroethane	11.2	0.20	ug/L	10.0		112	80-120	2.42	30	
m,p-Xylene	21.8	0.40	ug/L	20.0		109	80-121	2.58	30	
o-Xylene	10.9	0.20	ug/L	10.0		109	80-121	1.08	30	
Xylenes, total	32.7	0.60	ug/L	30.0		109	76-127	2.09	30	
Styrene	11.4	0.20	ug/L	10.0		114	80-124	2.42	30	
Bromoform	8.39	0.20	ug/L	10.0		83.9	51-134	3.17	30	



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Volatile Organic Compounds - Quality Control

Batch BHH0598 - EPA 5030 (Purge and Trap)

Instrument: NT2 Analyst: LH

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BHH0598-BSD1)		Prepared: 22-Aug-2019 Analyzed: 22-Aug-2019 12:39								
1,1,2,2-Tetrachloroethane	12.2	0.10	ug/L	10.0		122	77-123	3.54	30	
1,2,3-Trichloropropane	11.5	0.20	ug/L	10.0		115	76-125	1.14	30	
trans-1,4-Dichloro 2-Butene	10.1	1.00	ug/L	10.0		101	55-129	2.18	30	
n-Propylbenzene	11.1	0.20	ug/L	10.0		111	78-130	1.27	30	
Bromobenzene	10.9	0.20	ug/L	10.0		109	80-120	0.64	30	
Isopropyl Benzene	11.4	0.20	ug/L	10.0		114	80-128	0.04	30	
2-Chlorotoluene	10.2	0.10	ug/L	10.0		102	78-122	1.41	30	
4-Chlorotoluene	10.8	0.20	ug/L	10.0		108	80-121	0.69	30	
t-Butylbenzene	11.3	0.20	ug/L	10.0		113	78-125	0.39	30	
1,3,5-Trimethylbenzene	11.4	0.20	ug/L	10.0		114	80-129	2.08	30	
1,2,4-Trimethylbenzene	11.4	0.20	ug/L	10.0		114	80-127	0.48	30	
s-Butylbenzene	11.2	0.20	ug/L	10.0		112	78-129	1.15	30	
4-Isopropyl Toluene	11.3	0.20	ug/L	10.0		113	79-130	1.85	30	
1,3-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120	0.01	30	
1,4-Dichlorobenzene	10.5	0.20	ug/L	10.0		105	80-120	0.76	30	
n-Butylbenzene	10.9	0.20	ug/L	10.0		109	74-129	1.33	30	
1,2-Dichlorobenzene	10.6	0.20	ug/L	10.0		106	80-120	0.71	30	
1,2-Dibromo-3-chloropropane	8.49	0.50	ug/L	10.0		84.9	62-123	0.34	30	
1,2,4-Trichlorobenzene	10.8	0.50	ug/L	10.0		108	64-124	3.14	30	
Hexachloro-1,3-Butadiene	10.6	0.20	ug/L	10.0		106	58-123	1.67	30	
Naphthalene	10.8	0.50	ug/L	10.0		108	50-134	0.39	30	
1,2,3-Trichlorobenzene	11.2	0.20	ug/L	10.0		112	49-133	1.60	30	
Dichlorodifluoromethane	10.5	0.20	ug/L	10.0		105	48-147	1.27	30	
Surrogate: Dibromofluoromethane	4.97		ug/L	5.00		99.4	80-120			
Surrogate: 1,2-Dichloroethane-d4	4.93		ug/L	5.00		98.7	80-129			
Surrogate: Toluene-d8	5.08		ug/L	5.00		102	80-120			
Surrogate: 4-Bromofluorobenzene	5.09		ug/L	5.00		102	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.07		ug/L	5.00		101	80-120			



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Semivolatile Organic Compounds - SIM - Quality Control

Batch BHH0455 - EPA 3520C (Liq Liq)

Instrument: NT12 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BHH0455-BLK1) Prepared: 19-Aug-2019 Analyzed: 26-Aug-2019 13:56									
1,4-Dioxane	ND	0.4	ug/L						U
Surrogate: 1,4-Dioxane-d8	7.73		ug/L	10.0	77.3	33.6-120			
LCS (BHH0455-BS1) Prepared: 19-Aug-2019 Analyzed: 26-Aug-2019 14:22									
1,4-Dioxane	7.3	0.4	ug/L	10.0	73.0	39.9-120			
Surrogate: 1,4-Dioxane-d8	7.56		ug/L	10.0	75.6	33.6-120			
LCS Dup (BHH0455-BSD1) Prepared: 19-Aug-2019 Analyzed: 26-Aug-2019 14:49									
1,4-Dioxane	7.2	0.4	ug/L	10.0	72.3	39.9-120	0.85	30	
Surrogate: 1,4-Dioxane-d8	7.26		ug/L	10.0	72.6	33.6-120			



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Petroleum Hydrocarbons - Quality Control

Batch BHH0444 - EPA 3510C SepF

Instrument: FID4 Analyst: WMT

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD	RPD Limit	Notes
Blank (BHH0444-BLK1)		Prepared: 19-Aug-2019 Analyzed: 20-Aug-2019 12:32							
Gasoline Range Organics (Tol-C12)	ND	0.25	mg/L						U
Diesel Range Organics (C12-C24)	ND	0.50	mg/L						U
Motor Oil Range Organics (C24-C38)	ND	1.00	mg/L						U
Surrogate: o-Terphenyl	0.216		mg/L	0.225	96.0	50-150			
Surrogate: n-Triacontane	0.267		mg/L	0.225	118	50-150			



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Certified Analyses included in this Report

Analyte	Certifications
EPA 8260C in Water	
Chloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrolein	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Iodomethane	DoD-ELAP,NELAP,CALAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,CALAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,CALAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,CALAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Butanone	DoD-ELAP,NELAP,CALAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,CALAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE



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trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,CALAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
o-Xylene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Styrene	DoD-ELAP,NELAP,CALAP,WADOE
Bromoform	DoD-ELAP,NELAP,CALAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,CALAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,CALAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,CALAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,CALAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,CALAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE



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EPA 8270D-SIM in Water

1,4-Dioxane WADOE,NELAP,DoD-ELAP

NWTPH-HCID in Water

Gasoline Range Organics (Tol-C12) NELAP,DoD-ELAP,WADOE
Diesel Range Organics (C12-C24) NELAP,DoD-ELAP,WADOE
Motor Oil Range Organics (C24-C38) NELAP,DoD-ELAP,WADOE

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



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Notes and Definitions

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

TECHNICAL MEMORANDUM

DATE September 16, 2019

Project No. 9231000005.2019

TO Bill Kombol, Palmer Coking Coal Company

FROM Joseph Xi (Golder Associates)

EMAIL jxi@golder.com

**RE: LANDSBURG MINE SITE AUGUST 2019 DATA VALIDATION & QUALITY ASSURANCE /
QUALITY CONTROL REVIEW**

This Data Usability Summary Report (DUSR) presents the findings of the data quality assessment performed on the analyses of water samples collected from August 14 to 16, 2019 at the Landsburg Mine Site in Washington (Site) as part of the Landsburg Groundwater sampling project. Samples in the laboratory sample delivery group (SDG) as indicated in Table 1 were reviewed in this DUSR to identify quality issues which could affect the use of the sample data for decision making purposes.

Fourteen water samples, one field duplicate sample, one field blank, one equipment blank, and one trip blank were collected by Golder Associates, Inc. (Golder). Samples were analyzed by Analytical Resources Inc. of Tukwila, Washington for the following parameters:

- Volatile Organic Compounds (VOCs) following United States Environmental Protection Agency (USEPA) USEPA SW-846¹ Method 8260C, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS);
- 1,4-Dioxane following USEPA SW-846 Method 8270D, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS); and
- Northwest Total Petroleum Hydrocarbons – Hydrocarbon Identification Scan by NWTPH-HCID.

Quality assurance / quality control (QA/QC) reviews of laboratory data were performed in the laboratory in accordance with the laboratory quality assurance program plan (QAPP). The data validation QA/QC review focused primarily on laboratory results and quality control data to ensure that work plan data quality objectives were met for the project.

¹USEPA, 2015, Test methods for evaluating solid waste, physical/chemical methods (SW-846): 3rd edition, and subsequent updates, Environmental Protection Agency, National Center for Environmental Publications, Cincinnati, Ohio, accessed at URL <http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm>

Data validation was conducted in accordance with the criteria outlined in the National Functional Guidelines for Organic Review (USEPA 2017), modified to include method specific requirements of the laboratory, and laboratory standard operating procedures. Where there was a discrepancy between the QC criteria in the Guidelines and the QC criterion established in the analytic methodology, method-specific criteria, the QAPP, or professional judgment was used.

In general, chemical results for the samples collected at the Site were evaluated based on laboratory preservation, hold times, laboratory and field blank contamination, outlying precision or accuracy parameters, or based on professional judgment. The following definitions provide brief explanations of the qualifiers which may have been assigned to data during the data validation process.

Data Qualifier Definitions

- 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, but the result may be biased high.
- U The analyte was analyzed for but was not detected.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

The validation level for the data is Tier 2A, and included the following:

- Data package completeness assessment
- Verification of required deliverables
- Evaluation of holding times
- Laboratory narrative evaluation
- Evaluation and qualification of QC elements for surrogates, matrix spike samples, laboratory control samples, blanks (method, equipment, and trip blank) laboratory duplicate samples and field duplicate samples
- Evaluation of detection limits

Raw data and calibration elements, including GC instrument tuning and performance check, initial and continuing calibration, internal standard performance, and analyte identification, were not provided by the lab. Data review and validation was performed by an experienced QA chemist independent of the analytical laboratory and not directly involved in the project. Data qualifiers that were applied by the laboratory have been removed from the data summary report sheets, when applicable, and superseded by data validation qualifiers. Overall, the data review showed that data are acceptable for use and no data qualifiers are applied. Qualifier Summary Table (Table 2) is included with no qualifiers. For details about the data validation, refer to the data validation checklist in Attachment A. The following bulleted items highlight comments and/or qualifications to specific parameters:

- QAPP stipulated matrix spike analysis was not performed along with the VOCs. No action is taken since adequate accuracy and precision data are provided.
- The QAPP stipulated completeness goal of 90% was achieved.

Attachments

Attachment A Tables

Table 1 – Sample Collection and Analysis Summary

Table 2 – Qualifier Summary Table

Attachment B Level 2A Data Validation Checklist

References

EPA. 2017. USEPA Contract Laboratory Program, National Functional Guidelines for Organic Superfund Methods Data Review. OLEM 9355.0-136. EPA-540-R-2017—001/002, January. Available on the Web at: <https://www.epa.gov/clp/superfund-clp-national-functional-guidelines-data-review> (accessed June 26, 2019)

USEPA. 2015. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846. Third Edition. Washington DC: USEPA Office of Solid Waste. Available on the Web at: <https://www.epa.gov/hw-sw846/sw-846-compendium> (accessed June 26, 2019)

ATTACHMENT A

Tables

Table 1: Sample Collection and Analysis Summary
Landsburg Mine Water Sampling Investigation August 2019

Landsburg Mine Water Sampling Investigation	Field Identification	Collection Date	Lab Identification	Matrix	QC Samples	Analyses			
						VOCs (8260C)	SVOCs; 1,4-Dioxane (8270D-SIM)	Gasoline, Diesel, and Motor Oil Range Organics TPH-HCID (NWTPH-HCID)	Total TAML Metals (200.8/6010C /7470A)
Aug-19	LMW-7-0819	08/14/2019	19H0256-01	GW	-	X	-	X	-
19H0256	LMW-2-0819	08/14/2019	19H0256-02	GW	-	X	X	X	-
19H0256	LMW-4-0819	08/14/2019	19H0256-03	GW	-	X	X	X	-
19H0256	LMW-4-0819-D	08/14/2019	19H0256-04	GW	FD (LMW-4-0819)	X	X	X	-
19H0256	LMW-10-0819	08/14/2019	19H0256-05	GW	-	X	X	X	-
19H0256	LMW-12-0819	08/14/2019	19H0256-06	GW	-	X	X	X	-
19H0256	LMW-13R-0819	08/14/2019	19H0256-07	GW	-	X	X	X	-
19H0256	LMW-9-0819	08/14/2019	19H0256-08	GW	-	X	-	X	-
19H0256	LMW-8-0819	08/14/2019	19H0256-09	GW	-	X	-	X	-
19H0256	LMW-EB-0819	08/14/2019	19H0256-10	WQ	EB	X	-	X	-
19H0256	LMW-6-0819	08/15/2019	19H0256-11	GW	-	X	-	X	-
19H0256	LMW-14-0819	08/15/2019	19H0256-12	GW	-	X	-	X	-
19H0256	LMW-11-0819	08/15/2019	19H0256-13	GW	-	X	-	X	-
19H0256	LMW-15-0819	08/15/2019	19H0256-14	GW	-	X	-	X	-
19H0256	LMW-3-0819	08/15/2019	19H0256-15	GW	-	X	-	X	-
19H0256	LMW-5-0819	08/15/2019	19H0256-16	GW	-	X	-	X	-
19H0256	LMW-FB-0819	08/15/2019	19H0256-17	WQ	FB	X	X	-	-
19H0256	Trip Blanks	08/14/2019	19H0256-18	WQ	FB	X	-	-	-

Notes:

All analyses performed by Analytical Resources, Incorporated (ARI), Tukwila WA

Abbreviations:

EB - Equipment Blank
 FB - Field Blank
 FD - Field Duplicate
 QC - Quality Control
 SDG - Sample Delivery Group
 GW - Groundwater
 TB - Trip Blank
 WQ - Water Quality
 MS - Matrix Spike

NWTPH - Northwest Total Petroleum Hydrocarbon
 SVOCs - Semivolatile Organic Compounds
 SIM - Selected Ion Monitoring
 TAML - Target Analyte Metals List
 TPH-HCID - Total Petroleum Hydrocarbons - Hydrocarbon Identification Method
 VOCs - Volatile Organic Compounds

Table 2: Qualifier Summary Table
Landsburg Mine Water Sampling Investigation August 2019

SDG	Sample Name	Constituent	New Result	New RL	Qualifier	Reason
19H0256	All Samples	All Results	-	-	None Assigned	No Qualifiers Assigned
19H0256	All Samples	All Results	-	-	-	Laboratory applied U-qualifiers indicating non-detect results are retained unless other qualifications are indicated in this table. All other laboratory qualifiers are removed.

Abbreviations

QC - Quality Control

SDG - Sample Delivery Group

RL - Reporting Limit

Qualifier Definitions

U - Non-detect result

ATTACHMENT B

Level 2A Data Validation Checklist

QA LEVEL II - DATA EVALUATION CHECKLIST

Company Name: Golder Associates, Inc.

Project Manager: Joseph Xi

Project Name: Landsburg Groundwater 2019-08

Project Number: 923-1000-005.2019

Validated by Jessie Comeau/Informa LLC

Validation Date: September 16, 2019

Reviewed by Joseph Xi

Review Date: September 26, 2019

Laboratory: Analytical Resources, Inc. (ARI) in Tukwila, WA

SDG #: 19H0256

Analytical Method (type and no.): See DUSR Table 1

Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ Other _____

Work Plan or QAPP reference: Compliance Monitoring Plan and QAPP for Landsburg Mine Site (Exhibit D, to the Consent Decree, 2017).

Applicable Data Validation Guidance:

- National Functional Guidelines for Organic Review, USEPA 2017

Sample Information: See Table 1 (attached)

Field/COC Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	☒	☐	☐	_____
b) Sampling team indicated?	☒	☐	☐	_____
c) Sample location noted?	☒	☐	☐	_____
d) Sample type indicated (grab/composite)?	☐	☒	☐	<u>COC does not request this information</u>
e) Field QC noted?	☒	☐	☐	<u>See Table 1</u>
f) Field parameters collected (note types)?	☐	☐	☒	_____
g) Was the COC signed by both field and laboratory personnel?	☒	☐	☐	_____
h) Were samples received in good condition?	☒	☐	☐	<u>See Notes 1 and 2</u>
i) Were the correct preservatives used?	☒	☐	☐	_____
j) Was the sample cooler temperature within QC limits?	☐	☒	☐	_____

Laboratory Case Narrative

a) Does the laboratory narrative indicate deficiencies? ☐ YES ☒ NO ☐ NA _____

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	☒	☐	☐	_____
b) Were hold times met for sample analysis?	☒	☐	☐	_____
c) Was the correct method used?	☒	☐	☐	_____
d) Were appropriate reporting limits achieved?	☒	☐	☐	<u>See Note 3</u>
e) Were any sample dilutions noted?	☐	☒	☐	_____
f) Were any matrix problems noted?	☐	☒	☐	_____

QA LEVEL II - DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	_____
b) Was a method blank analysis performed according to the method used?	☒	☐	☐	_____
c) Was a method blank analysis performed for each instrument used for sample analyses?	☒	☐	☐	_____
d) Were analytes detected in the instrument blank(s)?	☐	☐	☒	_____
e) Were analytes detected in the field blank(s)?	☐	☒	☐	<u>Field blank: LMW-FB-0819</u>
f) Were analytes detected in the equipment blank(s)?	☐	☒	☐	<u>Equipment blank: LMW-EB-0819</u>
g) Were analytes detected in the trip blank(s)?	☐	☒	☐	<u>Trip Blank: Trip Blanks</u>
h) Were analytes detected in the storage blank(s)?	☐	☐	☒	_____
Surrogate (System Monitoring) Compounds	YES	NO	NA	COMMENTS
a) Were surrogate compounds added to all samples?	☒	☐	☐	_____
b) Were recoveries within control limits?	☒	☐	☐	_____
c) Were surrogate recoveries not calculated due to dilutions?	☐	☒	☐	_____
d) Were recoveries not calculated due to interference?	☐	☒	☐	_____
Laboratory Control Sample	YES	NO	NA	COMMENTS
a) Was an LCS analyzed once per SDG?	☒	☐	☐	_____
b) Were the proper compounds included in the LCS?	☒	☐	☐	_____
c) Was the LCS accuracy criteria met?	☒	☐	☐	_____
Matrix Spike/Matrix Spike Duplicate	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met (note %R)?	☐	☐	☒	<u>See Note 4</u>
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	_____
b) Was MSD accuracy criteria met (note %R)?	☐	☐	☒	_____
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	_____
c) Were MS/MSD precision criteria met (note RPD)?	☐	☐	☒	_____
Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	<u>LMW-4-0819 and LMW-4-0819-D</u>
b) Were field dup. precision criteria met (30%)?	☒	☐	☐	_____
c) Were lab duplicates analyzed?	☐	☒	☐	_____
d) Were lab dup. precision criteria met (note RPD)?	☐	☐	☒	_____
ICP Serial Dilution (SD)	YES	NO	NA	COMMENTS
a) Was an ICP SD analyzed once per SDG?	☐	☐	☒	_____
b) Was the ICP SD criteria met?	☐	☐	☒	_____

QA LEVEL II - DATA EVALUATION CHECKLIST

Comments/Notes:

1. Review of the Cooler Receipt Form indicates that one of the trip blank vials had an air bubble and that "three trip blanks included that were not on the COC". The trip blank was not noted on the COC. No action is taken other than to note that three vials were provided for trip blank analysis and two of three vials were received without air bubbles and in acceptable condition.
2. Review of the Cooler Receipt Form indicates that COC seals were not affixed to the outside of the cooler. Sample notes indicate that the samples were received in good condition. No action is taken in this case other than to note that the samples were hand delivered by Golder under chain of custody protocols.
3. QAPP stipulated reporting limits are met for requested compounds and reporting limits (RLs). ARI analyzed and/or reported three additional VOC compounds (dichlorodifluoromethane (CFC-12), bromoethane, and total xylenes).
4. MS/MSD analyses were not performed on a selected client sample as stipulated in the QAPP. No action is taken since LCS/LCSD analyses was performed with acceptable recoveries and RPDs.

Data Qualification: No qualifies are assigned. See Table 2 (attached)

Definitions:

SDG: Sample Delivery Group	QC: Quality Control
COC: Chain of Custody	QAPP: Quality Assurance Project Plan
VOC: Volatile Organic Compound	SVOC: Semivolatile Organic Compound
TCL: Target Compound List	DMC: Deuterated Monitoring Compound
%D: Percent Difference	RPD: Relative Percent Difference
LCS: Laboratory Control Sample	RSD: Relative Standard Deviation
LCSD: Laboratory Control Sample Duplicate	CRQL: Contract Required Quantitation Limit
MS/MSD: Matrix Spike/Matrix Spike Duplicate	RL: Reporting Limit
MDL: Method Detection Limit	PEM: Performance Evaluation Mixture
%R: Percent Recovery	SPCC: System Performance Check Compound
CC: Continuing Calibration	RT: Retention Time
RRF: Relative Response Factor	SPLP: Synthetic Precipitation Leaching Procedure
TCLP: Toxicity Characteristic Leaching Procedure	