



**REPORT**

**Compliance Monitoring Report**  
**December 2021 Quarterly Groundwater Sampling**  
*Landsburg Mine Site*

Submitted to:

**Washington Department of Ecology**

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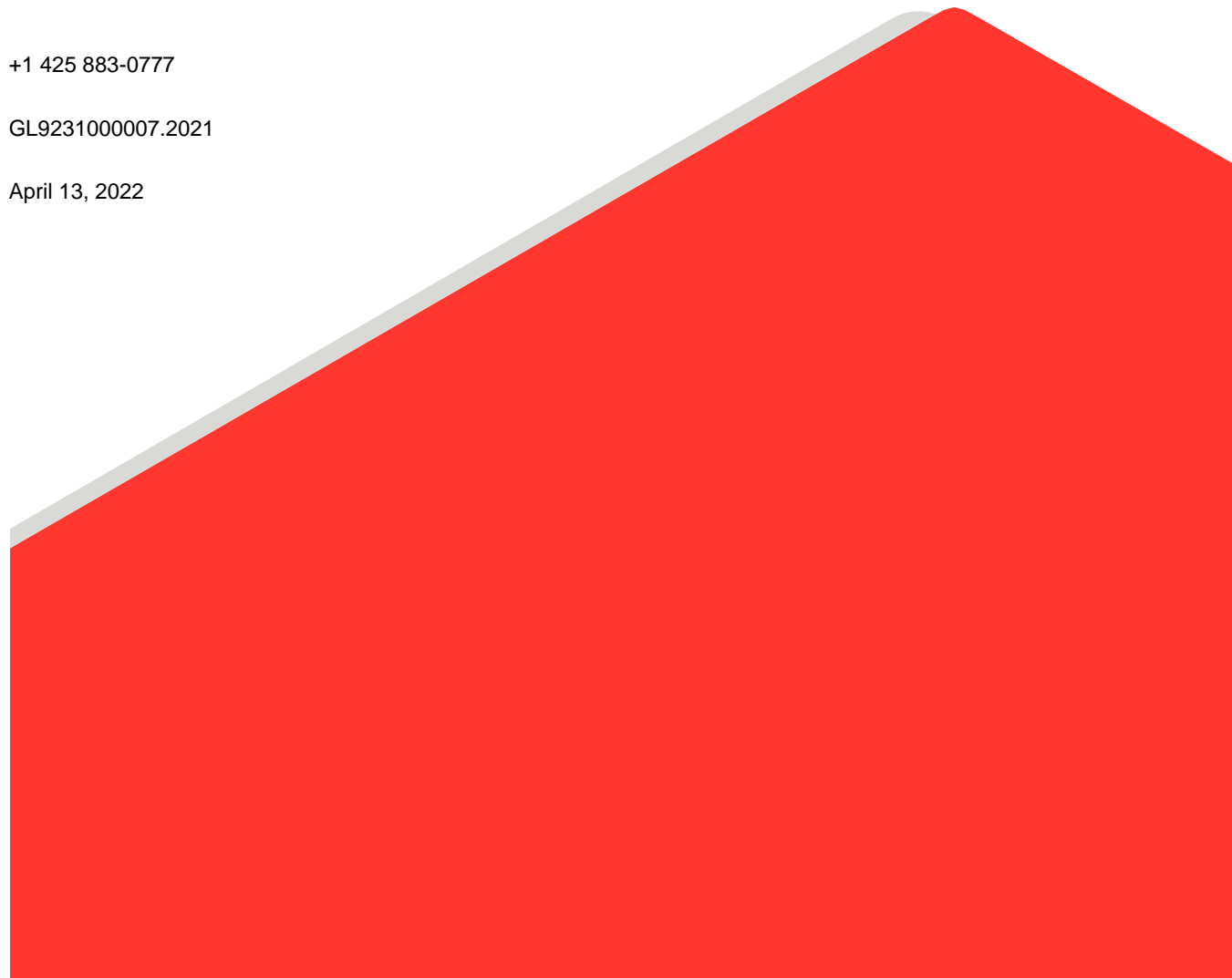
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## 1.0 INTRODUCTION

The Compliance Monitoring Plan (CMP) (Ecology 2017) describes the long-term confirmational monitoring required after remediation actions are completed at the Landsburg Mine Site (the Site). Additional groundwater monitoring requirements are specified in the Amendment to the Cleanup Action Plan (CAP) (Ecology 2021). This report presents the results of the fourth quarter 2021 long-term confirmational monitoring event, which was completed in December 2021.

The event was conducted from December 7 to 10, 2021, 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, LMW-15, LMW-20, LMW-21, and LMW-22. Sampling of the Landsburg Estates private well was also completed on December 17, 2021.

Figure 1 presents the locations of the monitoring wells. Figure 2 presents 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. 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. LMW-20, LMW-21, and LMW-22 monitor groundwater north of the Site, between the Site and the Cedar River.

## 2.0 SAMPLING ACTIVITIES

Groundwater sampling was conducted in accordance with the CMP (Ecology 2017) and the Amendment to the CAP (Ecology 2021), 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.
- Analyses of groundwater samples for the following parameters:
  - Volatile Organic Compounds (VOCs) by United States Environmental Protection Agency (USEPA) USEPA Method 8260D
  - 1,4-Dioxane by USEPA SW-846 Method 8270E
  - Total Petroleum Hydrocarbons (TPHs) by NWTPH-HCID
  - Total Metals by USEPA SW-846 Method 200.8 and SW-846 6010D
  - Total Mercury by USEPA SW-846 Method 7470A



Sampling of the Landsburg Estates private well was conducted in accordance with the CMP (Ecology 2017), and included the following activities:

- Well purging of a volume sufficient to flush out any standing water in the pipe configuration with the dedicated pumping system installed in the well to ensure sample representativeness.
- Measurement of field parameters including: pH, specific conductance, temperature, dissolved oxygen, ORP, and turbidity.
- Collection of representative samples in appropriate containers provided by the analytical laboratory.
- Analyses of groundwater samples for the following parameters:
  - VOCs by United States Environmental Protection Agency (USEPA) USEPA Method 8260D
  - 1,4-Dioxane by USEPA SW-846 Method 8270E
  - TPHs by NWTPH-HCID
  - Total Metals by USEPA SW-846 Method 200.8 and SW-846 6010D
  - Total Mercury by USEPA SW-846 Method 7470A

Appendix A presents the laboratory analytical data validation report with added data qualifiers noted. Appendix B presents the laboratory analytical data. Field sampling activities were documented on Sample Integrity Data Sheets (SIDS), provided in Appendix C.

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 LLC (ARI), of Tukwila, Washington, for analyses.

The laboratory data packages underwent data validation. Items of note are provided in a validation memorandum in Appendix A. In general, data were found to be acceptable with minor qualification, with the following exception: the analytical results for 2-chloroethyl vinyl ether were rejected. The matrix spike/ matrix spike duplicate (MS/MSD) results were non-detect and the calculated percent recovery of the associated MS/MSD did not recover. Following Guidelines and using professional judgment, the results for 2-chloroethyl vinyl ether were rejected. 2-chloroethyl vinyl ether has never been detected at the Site. Data qualifiers are defined, and all data qualifiers assigned under the data validation process are presented in the Appendix A data validation memorandum.

Table 1 presents depths to groundwater measured during the event and calculated static water level elevations. Table 2 presents the field parameter measurements and laboratory analytical results for each groundwater sample at the Site. Table 3 presents the field parameter measurements and laboratory analytical results for the Landsburg Estates private well sample.

### 3.0 RESULTS

The results of Site groundwater monitoring wells for the December 2021 monitoring event are summarized below:

- Laboratory analyses did not detect TPH above the laboratory reporting limits in any of the groundwater samples.

- There were no VOCs detected in groundwater above the trigger level concentrations prescribed in the CMP (Ecology 2017). The following VOCs were detected above their respective laboratory reporting limits.
  - 1,1-Dichloroethane (1,1-DCA) was detected in LMW-12 at a concentration of 1.17 micrograms per liter ( $\mu\text{g/L}$ ). 1,1-DCA has been detected at low levels in this well in previous sampling events. The reported concentration is less than the MTCA Method B groundwater cleanup level of 7.68  $\mu\text{g/L}$ .
  - Chloroethane was detected in LMW-4 at the reporting limit of 0.2  $\mu\text{g/L}$  and in LMW-12 at 1.34  $\mu\text{g/L}$ . The chloroethane detection in LMW-12 is consistent in concentration with previous detections of chloroethane in this well. The reported concentrations are significantly less than the MTCA Method B groundwater cleanup level of 80  $\mu\text{g/L}$ .
- In the December 2021 round of sampling, 1,4-dioxane was detected in LMW-2 (1.5  $\mu\text{g/L}$ ), LMW-4 (1.6  $\mu\text{g/L}$ ), and LMW-12 (0.9  $\mu\text{g/L}$ ). 1,4-dioxane has not been detected in any other Site monitoring wells. The December 2021 results are consistent with 1,4-dioxane concentrations reported during previous sampling of these wells. Under the approved Amendment to the CAP (Ecology 2021), 5 years of quarterly groundwater samples (20 rounds of sampling) will be collected in order to conduct a statistical analysis on 1,4-dioxane trends (CAP Amendment Section 4.2). The current status of the quarterly sampling for 1,4-dioxane is as follows:
  - LMW-2 and LMW-4 have 17 rounds of sampling data available for 1,4-dioxane.
  - LMW-10 has 16 rounds of sampling data available for 1,4-dioxane. 1,4-Dioxane has never been detected at LMW-10 in any sampling event.
  - LMW-12 has 15 rounds of sampling data available for 1,4-dioxane.
  - LMW-13R has 15 rounds of sampling data available for 1,4-dioxane. 1,4-Dioxane has never been detected at LMW-13R in any sampling event.
- Metals detected in groundwater samples during the current sampling round include the following:
  - The groundwater sample from LMW-12 and LMW-14 contained iron at concentrations above the MTCA Method B cleanup level of 11 milligrams per liter ( $\text{mg/L}$ ). Iron has been detected in mine groundwater above MTCA cleanup levels in every monitoring event at the Site. It is a naturally occurring metal that is commonly associated with groundwater from coal mines (Fuste et al. 1983). The concentrations of iron reported during the December 2021 sampling event are within the range of typical concentrations reported during previous groundwater monitoring events at the Site.
  - The groundwater sample from LMW-11 contained total arsenic at a concentration of 0.00924  $\text{mg/L}$ . Arsenic in LMW-11 is greater than the MTCA Method A groundwater cleanup level (0.005  $\text{mg/L}$ ) but less than the Washington State primary drinking water maximum contaminant level (0.01  $\text{mg/L}$ ). The MTCA groundwater cleanup level is based on typical groundwater background levels in the State of Washington. Arsenic has been detected in groundwater from LMW-11 near or above MTCA cleanup levels during every monitoring event since LMW-11 was installed. LMW-11 is screened within the deepest portions of the Rogers coal seam, where the groundwater is naturally reducing with low reduction-oxidation (redox) potential and low dissolved oxygen levels. Arsenic is a naturally occurring metal commonly detectable in groundwater, especially in groundwater having low redox and dissolved oxygen levels.

- The groundwater sample from LMW-14 contained cobalt at a concentration of 0.0191 mg/L, above the MTCA Method B cleanup level of 0.0048 Cobalt mg/L. Cobalt has been detected in LMW-14 in every monitoring event since it was installed. The December 2021 detection of 0.0191 mg/L is less than half of the historical high of 0.0515 mg/L, detected in March 2020. The cobalt detection in LMW-14 is naturally occurring in association with the coal mine water (Golder 2020).

The results of the Landsburg Estates private well December 2021 monitoring event are summarized below:

- Laboratory analyses did not detect TPH, VOCs, or 1,4-dioxane above the laboratory reporting limits.
- Naturally occurring, calcium, magnesium, manganese, potassium, and sodium were the only metals detected in the sample. Only manganese has an established MTCA groundwater cleanup level. The manganese concentration of 0.0125 mg/L reported in the Landsburg Estate private wells sample is more than an order of magnitude below the Method B cleanup level of 0.75 mg/L.

## 4.0 NEXT SAMPLING EVENT

The next compliance monitoring event is a quarterly confirmational monitoring event scheduled for March 2022. It includes sampling of Site groundwater monitoring wells LMW-2 through LMW-15.

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## 5.0 REFERENCES

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- Washington State Department of Ecology (Ecology). 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.
- Ecology. 2021. Amendment to Cleanup Action Plan Landsburg Mine Site MTCA Remediation Project, Ravensdale, Washington. March 26.

Tables

**Table 1: Groundwater Elevation Data, Landsburg Mine Site, December 7, 2021**

	LMW-1	LMW-2	LMW-3	LMW-4 <sup>1</sup>	LMW-5	LMW-6	LMW-7 <sup>1</sup>	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13R	LMW-14 <sup>1</sup>	LMW-15	LMW-20	LMW-21	LMW-22
<b>Water Depths</b>																		
Date of data collection	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021	12/7/2021
Time of data collection	3:56 PM	2:35 PM	8:45 AM	2:45 PM	8:53 AM	3:40 PM	8:35 AM	9:15 AM	4:05 PM	2:50 PM	3:45 PM	3:15 PM	3:10 PM	3:30 PM	3:50 PM	8:20 AM	8:15 AM	8:25 AM
Measured to Top of PVC (ft btc)	132.25	5.85	10.25	7.23	13.01	23.88	212.67	6.52	98.15	-0.10	156.05	11.61	4.70	158.56	150.05	14.93	9.73	8.63
<b>Surveyed Elevation</b>																		
Top of PVC (ft NAVD88)	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	546.8	544.09	542.86
Top of Monument (ft NAVD88)	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	546.92	544.36	543.13
Ground Level (ft NAVD88)	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	543.24	540.58	540.00
<b>Corrected Water Elevation</b>																		
Using PVC elevation (ft NAVD88)	<b>633.11</b>	<b>611.94</b>	<b>646.50</b>	<b>612.04</b>	<b>645.26</b>	<b>608.45</b>	<b>558.84</b>	<b>640.45</b>	<b>645.84</b>	<b>619.08</b>	<b>646.14</b>	<b>613.74</b>	<b>621.16</b>	<b>646.56</b>	<b>646.41</b>	<b>531.87</b>	<b>534.36</b>	<b>534.23</b>

Notes:  
<sup>1</sup> Data corrected to accommodate well inclination from vertical  
 NA = Not applicable  
 NC = Data not collected  
 ft btc = feet below top of casing  
 ft NAVD88 = elevation in feet NAVD88



Table 2: December 2021 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-2 Duplicate	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-8	LMW-9	LMW-10	LMW-11	LMW-12	LMW-13R	LMW-14	LMW-15	LMW-20	LMW-21	LMW-22	Field Blank	Trip Blank 1	Trip Blank 2
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	0.2 U	0.2 U	NA	NA	NA	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	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	NA	NA	NA	0.5 U	0.5 U	0.5 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	NA	NA	NA	5 U	5 U	5 U
Iodomethane	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	NA	NA	NA	1 U	1 U	1 U
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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	0.2 U	0.2 U	0.2 U
1,2,3-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	NA	NA	NA	0.5 U	0.5 U	0.5 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	NA	NA	NA	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	NA	NA	NA	0.2 U	0.2 U	0.2 U
1,1,2,2-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	NA	NA	NA	0.2 U	0.2 U	0.2 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	NA	NA	NA	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	0.2 U	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	0.2 U	0.2 U	0.2 U
1,2,3-Trichloropropane	ug/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	NA	NA	NA	0.25 U	0.25 U	0.25 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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	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	NA	NA	NA	0.6 U	0.6 U	0.6 U
<b>Semi-Volatile Organic Compounds (SVOCs)</b>																						
1,4-Dioxane	ug/L	1.5	1.6	NA	1.6	NA	NA	NA	NA	NA	0.4 U	NA	0.9	0.4 U	NA	NA	0.4 U	0.4 U	0.4 U	0.4 U	NA	NA
<b>Hydrocarbon Identification</b>																						
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	NA	NA	NA	0.5 U	NA	NA
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	NA	NA	NA	0.25 U	NA	NA
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	NA	NA	NA	1 U	NA	NA

Notes:  
 U - Analyte was not detected above the Reporting Limit (RL).  
 J - Analyte was detected above the Method Detection Limit (MDL) but below the RL.  
 R - Analytical result is unusable because certain data quality criteria were not met.  
 NA - Not Applicable



**Table 3: December 2021 Analytical Results Landsburg Estates Well**

ANALYTE	UNITS	Landsburg Estates	Trip Blank
		12/17/2021	-
<b>Field Parameter</b>			
Temperature	°C	8.4	-
pH	stnd	6.8	-
Specific Conductance	uS/cm	204.7	-
Dissolved Oxygen	mg/L	6.55	-
ORP	mV	210.8	-
Turbidity	NTU	0.15	-
<b>Metals (Total)</b>			
Aluminum	mg/L	1 U	NA
Antimony	mg/L	0.003 U	NA
Arsenic	mg/L	0.003 U	NA
Barium	mg/L	0.5 U	NA
Beryllium	mg/L	0.01 U	NA
Cadmium	mg/L	0.002 U	NA
Calcium	mg/L	35.2	NA
Chromium	mg/L	0.01 U	NA
Cobalt	mg/L	0.01 U	NA
Copper	mg/L	0.003 U	NA
Iron	mg/L	0.2 U	NA
Lead	mg/L	0.01 U	NA
Magnesium	mg/L	10.7	NA
Manganese	mg/L	0.0125	NA
Mercury	mg/L	0.001 U	NA
Nickel	mg/L	0.01 U	NA
Potassium	mg/L	1.08	NA
Selenium	mg/L	0.025 U	NA
Silver	mg/L	0.005 U	NA
Sodium	mg/L	8.95	NA
Thallium	mg/L	0.002 U	NA
Vanadium	mg/L	0.003 U	NA
Zinc	mg/L	0.02 U	NA
<b>Volatile Organic Compounds (VOCs)</b>			
Acetone	ug/L	8.91 U	5 U
Acrolein	ug/L	5 UJ	5 U
Acrylonitrile	ug/L	1 UJ	1 U
Benzene	ug/L	0.2 U	0.2 U
Bromobenzene	ug/L	0.2 U	0.2 U
Bromochloromethane	ug/L	0.2 U	0.2 U
Bromoform	ug/L	0.2 U	0.2 U
Bromomethane	ug/L	1 U	1 U
methyl ethyl ketone	ug/L	5 U	5 U
n-Butylbenzene	ug/L	0.2 U	0.2 U
Sec-Butylbenzene	ug/L	0.2 U	0.2 U
tert-butylbenzene	ug/L	0.2 U	0.2 U
Carbon Disulfide	ug/L	0.2 U	0.2 U
Carbon Tetrachloride	ug/L	0.2 U	0.2 U
Chlorobenzene	ug/L	0.2 U	0.2 U
Chloroethane	ug/L	0.2 U	0.2 U
2-Chloroethyl vinyl ether	ug/L	1 R	1 U
Chloroform	ug/L	0.2 U	0.2 U
Chloromethane	ug/L	0.5 U	0.5 U
2-Chlorotoluene	ug/L	0.1 U	0.1 U
4-Chlorotoluene	ug/L	0.2 U	0.2 U
Dichlorodifluoromethane	ug/L	0.2 U	0.2 U
1,2-Dibromo-3-Chloropropane	ug/L	0.5 U	0.5 U
Ethylene Dibromide	ug/L	0.1 U	0.1 U

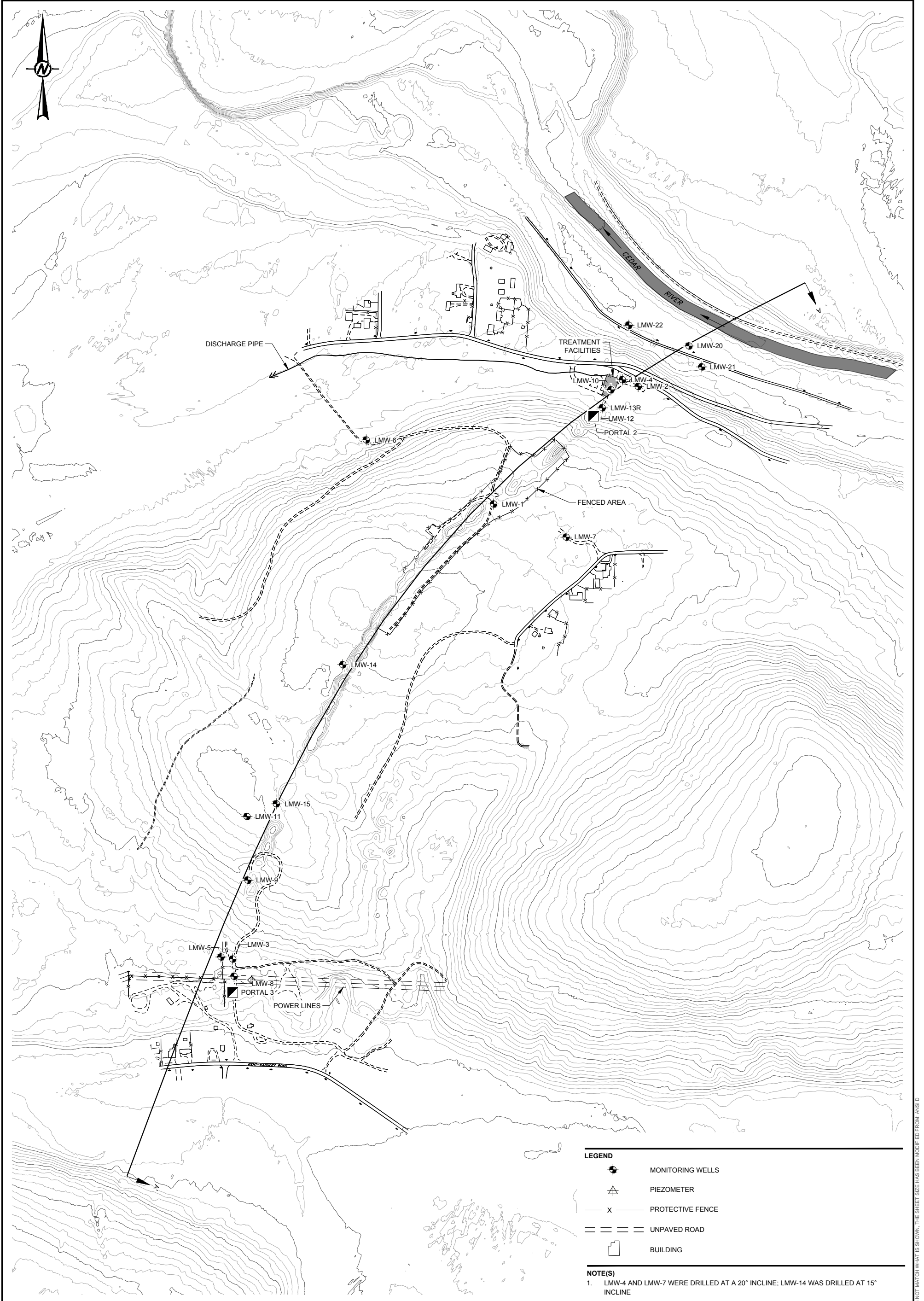
**Table 3: December 2021 Analytical Results Landsburg Estates Well**

ANALYTE	UNITS	Landsburg Estates	Trip Blank
Dibromomethane	ug/L	0.2 U	0.2 U
1,2-Dichlorobenzene	ug/L	0.2 U	0.2 U
1,3-Dichlorobenzene	ug/L	0.2 U	0.2 U
1,4-Dichlorobenzene	ug/L	0.2 U	0.2 U
Trans-1,4-Dichloro-2-butene	ug/L	1 U	1 U
1,1-Dichloroethane	ug/L	0.2 U	0.2 U
1,2-Dichloroethane	ug/L	0.2 U	0.2 U
1,1-Dichloroethene	ug/L	0.2 U	0.2 U
Cis-1,2-Dichloroethene	ug/L	0.2 U	0.2 U
Trans-1,2-Dichloroethene	ug/L	0.2 U	0.2 U
1,2-Dichloropropane	ug/L	0.2 U	0.2 U
1,3-Dichloropropane	ug/L	0.1 U	0.1 U
2,2-Dichloropropane	ug/L	0.2 U	0.2 U
1,1-Dichloropropene	ug/L	0.1 U	0.1 U
Cis-1,3-Dichloropropene	ug/L	0.2 U	0.2 U
Trans-1,3-Dichloropropene	ug/L	0.2 U	0.2 U
Ethylbenzene	ug/L	0.2 U	0.2 U
Hexachlorobutadiene	ug/L	0.5 U	0.5 U
2-Hexanone	ug/L	5 U	5 U
Iodomethane	ug/L	1 U	1 U
Cumene	ug/L	0.2 U	0.2 U
p-Isopropyltoluene	ug/L	0.2 U	0.2 U
Methylene Chloride	ug/L	1 U	1 U
Methyl isobutyl ketone	ug/L	2.5 U	2.5 U
Naphthalene	ug/L	0.5 U	0.5 U
n-Propylbenzene	ug/L	0.2 U	0.2 U
Styrene	ug/L	0.2 U	0.2 U
1,2,3-Trichlorobenzene	ug/L	0.5 U	0.5 U
1,2,4-Trichlorobenzene	ug/L	0.5 U	0.5 U
1,1,1,2-Tetrachloroethane	ug/L	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	ug/L	0.2 U	0.2 U
Tetrachloroethene	ug/L	0.2 U	0.2 U
Toluene	ug/L	0.2 U	0.2 U
1,1,1-Trichloroethane	ug/L	0.2 U	0.2 U
1,1,2-Trichloroethane	ug/L	0.2 U	0.2 U
Trichloroethene	ug/L	0.2 U	0.2 U
CFC-113	ug/L	0.2 U	0.2 U
1,2,3-Trichloropropane	ug/L	0.25 U	0.25 U
1,2,4-Trimethylbenzene	ug/L	0.2 U	0.2 U
1,3,5-Trimethylbenzene	ug/L	0.2 U	0.2 U
Vinyl Acetate	ug/L	0.2 U	0.2 U
Vinyl Chloride	ug/L	0.1 U	0.1 U
m, p-Xylene	ug/L	0.4 U	0.4 U
o-Xylene	ug/L	0.2 U	0.2 U
Total Xylenes	ug/L	0.6U	0.6 U
<b>Semi-Volatile Organic Compounds (SVOCs)</b>			
1,4-Dioxane	ug/L	0.4 UJ	NA
<b>Hydrocarbon Identification</b>			
Diesel Range	mg/L	0.5 U	NA
Gas Range	mg/L	0.25 U	NA
Lube Oil Range	mg/L	1 U	NA

Notes:

- U - Analyte was not detected above the Reporting Limit (RL).
- J - Analyte was detected above the Method Detection Limit (MDL) but below the RL.
- R - Analytical result is unusable because certain data quality criteria were not met.
- NA - Not Applicable

## 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

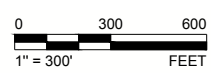
CLIENT  
 LANDSBURG MINE SITE PLP GROUP

PROJECT  
 LANDSBURG MINE SITE  
 MTCA REMEDIAL ACTION

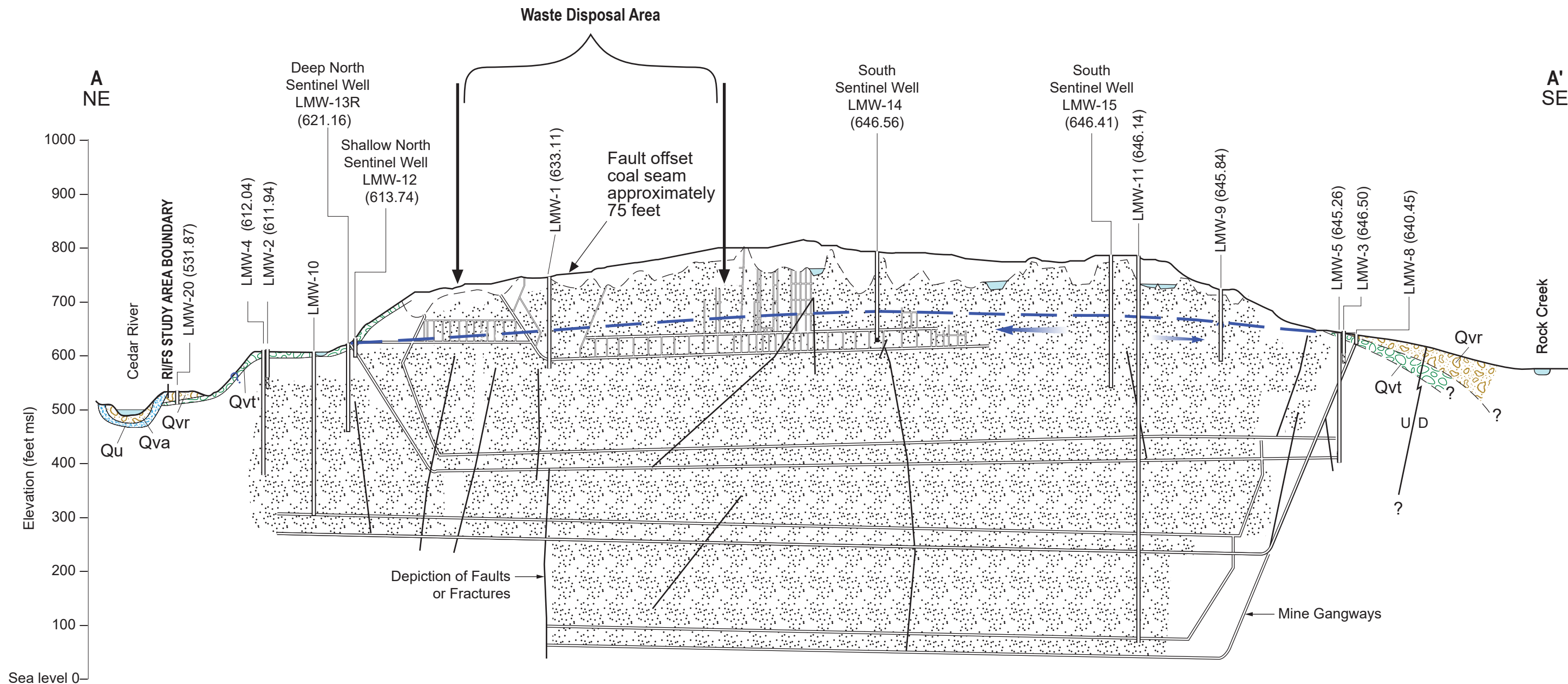
CONSULTANT	YYYY-MM-DD	2019-05-06
	DESIGNED	REDMOND
	PREPARED	JX
	REVIEWED	JX
	APPROVED	GZ

TITLE  
**GROUNDWATER MONITORING LOCATIONS**

PROJECT NO.	PHASE	REV.	FIGURE
9231000005	1200	A	1



1 in. IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/D



- EXPLANATION**
- Potentiometric surface
  - Outline of trench bottom
  - LMW-2 (609.99) Well ID (water level in ft. amsl)
  - Qvt Till, compact mixture of gravel occasional boulders in clayey silty sand matrix
  - Sandstone
  - Surface water feature

- Anticipated collapsed zone within mine
- Qu Drift, till, fluvial sand and gravel, lacustrine sand, silt, clay and peat
- Qvr Recessional outwash, well sorted sand and pebble-cobble
- Qva Advanced outwash pebble-cobble gravel may include very fine sand
- Monitoring Interval

Groundwater Flow Direction

**Sources for the Geology and Mine Information:**  
 J.E. Luzier 1969; surficial geology  
 State of Washington, Water Well reports  
 Mine Superintendent's Records  
 Landsburg Well Logs

NOTE: Vertical to horizontal scale ratio is 2.5:1  
 Wells are project normal into the strike of the Cross-Section A-A'  
 A' Groundwater elevation obtained 09/28/2021



CLIENT	LANDSBURG PLP GROUP		PROJECT	LANDSBURG MINE SITE	
CONSULTANT	WSP GOLDER	DATE	2021-12-07	TITLE	CROSS-SECTION ALONG STRIKE AT COAL SEAM DECEMBER 7, 2021 CROSS-SECTION A-A'
		PREPARED	REDMOND	PROJECT No.	923-1000-007
		DESIGN		PHASE	2021
		REVIEW			
		APPROVED			

G:\PalmerCakingCoal\LandsburgMine\A09\_PROJECTS\9231000002\_PFI\_Remediation\15402\_PRODUCTION\INDD\9231000\_002\_R154\_003.mxd



**APPENDIX A**

**Laboratory Analytical Report Data Validation  
and Quality Assurance / Quality Control  
Review Memorandum**

## TECHNICAL MEMORANDUM

**DATE** April 4, 2022

**Project No.** 923-1000-007.2021

**TO** Bill Kombol  
Palmer Coking Coal Company

**FROM** Joseph Xi (Golder Associates)

**EMAIL** [jxi@golder.com](mailto:jxi@golder.com)

### **LANDSBURG MINE SITE DECEMBER 2021 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 on December 7, 8, 9, 10, and 17, 2021 at the Landsburg Mine Site in Washington (Site) and the Landsburg Estates private well as part of the Landsburg Groundwater sampling project. Samples in the laboratory sample delivery group (SDG) as indicated in Table 1 was reviewed in this DUSR to identify quality issues which could affect the use of the sample data for decision making purposes.

Eighteen (18) water samples, one (1) field duplicate sample, one (1) field blank, and three (3) trip blanks were collected by Golder Associates USA, Inc. (Golder). Samples were analyzed by Analytical Resources LLC. of Tukwila, Washington for the following parameters:

- Volatile Organic Compounds (VOCs) following United States Environmental Protection Agency (USEPA) USEPA SW-846<sup>1</sup> Method 8260D, Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)
- 1,4-Dioxane following USEPA SW-846 Method 8270E, Semivolatile Organic Compounds by GC/MS
- Northwest Total Petroleum Hydrocarbons – Hydrocarbon Identification Scan by NWTPH-HCID
- Total Metals by USEPA SW-846 Method 200.8 and SW-846 6010D
- Total Mercury by USEPA SW-846 Method 7470A

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.

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<sup>1</sup> USEPA. 2020. Test methods for evaluating solid waste, physical/chemical methods (SW-846): 3rd edition, and subsequent updates, Environmental Protection Agency, accessed at URL <https://www.epa.gov/hw-sw846>

Data validation was conducted in accordance with the criteria outlined in the National Functional Guidelines for Organic Review (USEPA 2020a<sup>2</sup>) and Inorganic Review (USEPA 2020b<sup>3</sup>), 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.
- J- The result is an estimated quantity, but the result may be biased low.
- UJ The analyte was analyzed for but was not detected. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- 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 personnel independent of the analytical laboratory and not

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<sup>2</sup> United States Environmental Protection Agency (USEPA). 2020a. National Functional Guidelines for Organic Superfund Methods Data Review. OLEM 9240.0-51. EPA-540-R-20-005, November.

<sup>3</sup> USEPA. 2020b. National Functional Guidelines for Inorganic Superfund Methods Data Review. OLEM 9240.0-66. EPA-542-R-20-006, November.



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, except for 2-chloroethyl vinyl ether. The MS/MSD results were non-detect and the calculated percent recovery of the associated MS/MSD did not recover. Following Guidelines and using professional judgment, the results for 2-chloroethyl vinyl ether were rejected (R). 2-chloroethyl vinyl ether was not detected during the December 2021 sampling round and has never been detected at the Site. Other minor data qualifiers related to sample preservation were also reported.

The laboratory analyzed analytes 2-chloroethyl vinyl ether, acrolein, and acrylonitrile from the preserved volatile organic analysis (VOA) vials. Due to the acid-labile nature of analytes 2-chloroethyl vinyl ether, acrolein and acrylonitrile, when samples were collected in acid-preserved vials but all associated LCS/LCSDs were within or above QC criteria, the associated non-detect results for these three analytes were qualified as estimated (UJ) due to possible acid degradation, except for 2-chloroethyl vinyl ether, the results for which were rejected as noted above. 2-chloroethyl vinyl ether, acrolein, and acrylonitrile were not detected during the December 2021 sampling round and have never been detected at the Site.

All of the samples collected in the field, with the exception of LMW-14-1221, contained low level detections of acetone ranging from 6.16 µg/L to 13.3 µg/L. Acetone is a common laboratory artefact. Acetone was detected at a concentration of 7.8 µg/L in the field blank. A review of the previous quarterly rounds of data collected in 2021 did not identify the same detects of acetone. Using professional judgment, all of the acetone results were qualified as non-detect (U) at the sample concentration.

Qualifier Summary Table (Table 2) is included with the qualifiers applied. 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:

- A data completeness of 99% was achieved, which exceeds the QAPP stipulated completeness goal of 90%.

Attachments: Attachment A Tables

Table 1 – Sample Collection and Analysis Summary Landsburg Mine Water  
Sampling Investigation December 2021

Table 2 – Qualifier Summary Table Landsburg Mine Water Sampling Investigation  
December 2021

Attachment B Level 2A Data Validation Checklist

**ATTACHMENT A**

## Tables

**Table 1: Sample Collection and Analysis Summary**  
**Landsburg Mine Water Sampling Investigation - December 2021**

SDG	Field Identification	Collection Date	Lab Identification	Matrix	QC Samples	Analyses/Parameters					
						VOCs (8260D)	1,4-Dioxane (8270E-SIM)	Select Total Metals (EPA 200.8/6010D/7470A)	NWTPH HCID	Dissolved Metals	Se and As by E200.8 UCT-KED
21L0146	LMW-3-1221	12/7/21 12:05	21L0146-01	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0146	LMW-8-1221	12/7/21 13:50	21L0146-03	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0146	LMW-5-1221	12/7/21 15:25	21L0146-05	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0146	LMW-12-1221	12/7/21 17:10	21L0146-07	GW	-	X	X	X	X	X <sup>a</sup>	X
21L0146	LMW-2-1221	12/8/21 11:25	21L0146-09	GW	-	X	X	X	X	X <sup>a</sup>	X
21L0146	LMW-2-1221-D	12/8/21 11:30	21L0146-11	GW	FD	X	X	X	X	X <sup>a</sup>	X
21L0146	LMW-4-1221	12/8/21 12:50	21L0146-13	GW	MS/MSD	X	X	X	X	X <sup>a</sup>	X
21L0146	LMW-10-1221	12/8/21 14:50	21L0146-15	GW	-	X	X	X	X	X <sup>a</sup>	X
21L0146	LMW-13R-1221	12/8/21 15:50	21L0146-17	GW	-	X	X	X	X	-	X
21L0146	LMW-FB-1221	12/8/21 15:25	21L0146-19	WQ	FB	X	X	X	X	-	X
21L0146	Trip Blank-1221-1	12/8/21 15:25	21L0146-20	WQ	TB	X	-	-	-	-	-
21L0178	LMW-6-1221	12/9/21 11:00	21L0178-01	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0178	LMW-7-1221	12/9/21 9:40	21L0178-03	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0178	LMW-9-1221	12/9/21 12:45	21L0178-05	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0178	LMW-11-1221	12/9/21 12:30	21L0178-07	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0178	LMW-14-1221	12/9/21 10:55	21L0178-09	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0178	LMW-15-1221	12/9/21 13:35	21L0178-11	GW	-	X	-	X	X	X <sup>a</sup>	X
21L0178	LMW-20-1221	12/9/21 16:05	21L0178-13	GW	-	-	X	-	-	-	-
21L0178	LMW-21-1221	12/9/21 14:40	21L0178-14	GW	-	-	X	-	-	-	-
21L0178	LMW-22-1221	12/9/21 15:20	21L0178-15	GW	-	-	X	-	-	-	-
21L0178	Trip Blank-1221-2	12/9/21 9:40	21L0178-16	WQ	TB	X	-	-	-	-	-
21L0271	Landsburg Estates-1221	12/17/21 09:15	21L0271-01	W	-	X	X	X	X	-	-
21L0271	Trip Blank	12/17/21 09:15	21L0271-02	WQ	TB	X	-	-	-	-	-

**Notes**

All analyses performed by Analytical Resources, Incorporated (ARI), Tukwila WA.  
 All samples collected for dissolved metals were placed on hold and subsequently not analyzed.

a: samples have been placed on hold by PM

**Abbreviations**

- GW: Groundwater
- Se: Selenium
- As: Arsenic
- WQ: Water quality
- VOCs: Volatile Organic Compounds
- SIM: Selective Ion Monitoring
- EPA: Environmental Protection Agency
- NWTPH: Northwest Total Petroleum Hydrocarbons
- UCT-KED: Universal Cell Technology-Kinetic Energy Discrimination
- HCID: Hydrocarbon Identification

**Table 2: Qualifier Summary Table**

**Lansburg Mine Water Sampling Investigation - December 2021**

SDG	Sample Name	Constituent	New Result	New MDL	New RL	Qualifier	Reason
21L0146	All results	acrolein	--	--	--	UJ	Improper preservation
21L0146	All results	acrylonitrile	--	--	--	UJ	Improper preservation
21L0146	All results	2-Chloroethyl vinyl ether	--	--	--	R	MS/MSD ND/ND
21L0146	LMW-2-1221	Acetone	--	13	13	U	Field blank contamination; Potential VOA vial contaminant
21L0146	LMW-2-1221-D	Acetone	--	6.86	6.86	U	Field blank contamination; Potential VOA vial contaminant
21L0178	LMW-7-1221	Sodium	--	--	--	J-	MS/MSD recovery below QC limits
21L0271	Lansburg Estates-1221	1,4-Dioxane	--	--	--	UJ	LCS/LCSD recovery below QC limits
21L0146	LMW-3-1221	Acetone	--	8.03	8.03	U	Potential VOA vial contaminant
21L0146	LMW-8-1221	Acetone	--	7.59	7.59	U	Potential VOA vial contaminant
21L0146	LMW-5-1221	Acetone	--	8.03	8.03	U	Potential VOA vial contaminant
21L0146	LMW-12-1221	Acetone	--	6.16	6.16	U	Potential VOA vial contaminant
21L0146	LMW-4-1221	Acetone	--	8.09	8.09	U	Potential VOA vial contaminant
21L0146	LMW-10-1221	Acetone	--	13.3	13.3	U	Potential VOA vial contaminant
21L0146	LMW-13R-1221	Acetone	--	9.54	9.54	U	Potential VOA vial contaminant
21L0178	LMW-6-1221	Acetone	--	10.3	10.3	U	Potential VOA vial contaminant
21L0178	LMW-7-1221	Acetone	--	8.96	8.96	U	Potential VOA vial contaminant
21L0178	LMW-9-1221	Acetone	--	13	13	U	Potential VOA vial contaminant
21L0178	LMW-11-1221	Acetone	--	6.59	6.59	U	Potential VOA vial contaminant
21L0178	LMW-15-1221	Acetone	--	8.78	8.78	U	Potential VOA vial contaminant
21L0271	Lansburg Estates-1221	Acetone	--	8.91	8.91	U	Potential VOA vial contaminant
--	All Samples	All Results	--	--	--	--	Laboratory applied U-qualifiers are retained unless other qualifications are indicated in this table. All other laboratory qualifiers are removed.

**Abbreviations**

MDL - Method Detection Limit

MS - Matrix Spike

Notes

QC - Quality Control

RL - Reporting Limit

SDG - Sample Delivery Group

**Qualifier Definitions**

UJ: Non-Detect Result, RL is estimated

Abbreviations

U: Not detected above the RL

**ATTACHMENT B**

## Level 2A Data Validation Checklist

**QA LEVEL 2A - DATA VERIFICATION/DATA VALIDATION CHECKLIST**

**Project Name:** Landsburg Groundwater

**Project Number/Phase/Task:** GL9231000007 2021

**Reviewing Company:** Golder Associates

**Project Manager:** Gary Zimmerman

**Data Evaluator:** Julia Campbell

**Data Evaluation Date:** January 24, 2022

**Checked by:** Michael Shadle

**Review Date:** January 26, 2022

**Laboratory:** Analytical Resources, Inc., Tukwila, WA

**Lab SDG #:** 21L0146, 21L0178, 21L0271

**Matrix:**  Aqueous     Soil     Sediment     Waste     Air     Other:

**Analytical Methods:** See Table 1.

**Sample Information:** See Table 1.

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

**Data Validation Guidance:** National Functional Guidelines for Organic Superfund Methods Data Review, EPA-540-R-20-005, November 2020 and National Functional Guidelines for Inorganic Superfund Methods Data Review, EPA-EPA-542-R-20-006, November 2020

<b>COC and Sample Receipt</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
a) COC complete and correct?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b) COC documents release of custody (signed and dated)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
c) Field QC types provided (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FB, TB; See Table 1
d) Did the cooler contents match the COC?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
e) Were samples received in good condition?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		See Note 1
f) Were cooler temperatures within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

<b>Data Package Information</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
a) Laboratory name and location documented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b) All samples on COC reported in data package?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
c) Requested analytical methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
d) Requested sample preparation methods used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Requested analyte list reported?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
f) Requested units reported?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Did the laboratory define the qualifiers used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
h) Data package contains all information necessary to complete the data quality review?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		All Information for a 2A Scope

<b>Analytical Assessment</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
a) Solid samples reported on a dry-weight basis?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were solid samples percent moisture criteria acceptable?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
d) Were detected concentrations less than the QL qualified by the laboratory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		No Results Less than RL
e) Were detected concentrations above the calibration range reported by the laboratory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

<b>Analytical Assessment</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
f) Did the laboratory satisfy the requested sensitivity requirements?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		Results were only reported to the RL.
<b>Laboratory Case Narrative</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
a) Do the laboratory narrative or laboratory qualifiers indicate deficiencies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were all deficiencies noted in the laboratory qualifiers or narrative?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Preservation and Holding Time</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENT</b>
a) Were samples properly preserved?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		See Note 2
b) Were holding times met for sample preparation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were holding times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
<b>Blanks</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
a) Were blanks analyzed at the appropriate frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b) Were any analytes detected in the associated preparation/method blank?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
c) Were any analytes detected in the associated trip blanks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
d) Were any analytes detected in the associated field or equipment/rinsate blanks?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Note 3
e) Were any analytes detected in the associated storage blanks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Surrogates or Deuterated Monitoring Compounds</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
a) Were the correct surrogate compounds added to each sample?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were surrogate recoveries within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) If not, were samples analyzed at dilution factors of 20x or greater?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>LCS/LCSD</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
a) Were LCS/LCSD reported at the appropriate frequency?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
b) Were proper analytes included in the LCS/LCSD?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
c) Were LCS/LCSD recoveries within control limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>		See Note 4
d) Were RPD values within control limits (if LCSD was analyzed)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>MS/MSDs</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
a) Were project-specific MS (and MSD) reported?	<input checked="" type="checkbox"/>	<input type="checkbox"/>		LMW-4-1221
b) Were proper analytes reported in the MS/MSD?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LMW-7-1221
c) Were project-specific MS/MSD recoveries within control limits?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Note 5

MS/MSDs	YES	NO	NA	COMMENTS
d) If not, were sample concentrations greater than 4x the spiking concentration?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Note 5
e) Was the RPD or absolute difference within control limits (if project-specific MSD analyzed)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were project-specific post-digestion spikes analyzed?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
g) Were project-specific post-digestion spike recoveries within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were project-specific laboratory duplicates reported?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Was laboratory duplicate RPD or absolute difference criteria acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were field duplicates reported?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LMW-2-1221/ LMW-2-1221-D
d) Was field duplicate RPD or absolute difference criteria acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

ICP Serial Dilution (SD)	YES	NO	NA	COMMENTS
a) Was project-specific ICP SD data provided?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were project-specific ICP SD within acceptable criteria?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Overall Evaluation	YES	NO	NA	COMMENTS
a) Were there any other technical problems not previously addressed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Note 6
b) Were data acceptable and usable, except where noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Comments/Notes:**

- In SDG 21L0146, the work order indicates that one of the VOC vials (21L0146-13 AJ) contained bubbles. In SDG 21L0178, the work order indicates that one of the VOC vials (21L0178-09J) contain bubbles. The laboratory confirmed that these vials were not used for sample analysis. Sample containers 21L0178-07 A, 21L0146-06 A, and 21L0146-13 C for metal analysis were received about a pH of 2. The laboratory confirmed that they adjusted the pH to <2 prior to analysis.
- Samples for analysis of acrolein and acrylonitrile were collected in preserved VOA vials and the recovery was most likely lost due to the acid-labile nature of said compounds. Following Guidelines and using professional judgment non-detects are qualified 'UJ' and detects are qualified 'J'. See Note 5 for clarification on 2-chloroethyl vinyl ether.
- Analytes were detected in the field blank, as shown in the table below. Following Organic Guidelines, when the associated blank concentration was greater than the RL and associated sample results were either non-detect or were greater than 2x the RL, data were not qualified. If the result is < 2x the reporting limit but < blank result it is qualified as non-detect (U) at the sample concentration.

SDG	Blank ID	Method	Analyte	Result	Qualifier	RL	Units
21L0146	LMW-FB-1221	EPA 8260D	Acetone	7.80		5.0	µg/L



4. The following analytes were outside QC limits. Only one indicator does not meet QC criteria therefore no qualifications are needed. For SDG 21L0271, associated samples with non-detect results were qualified (UJ).

SDG	QC sample ID	Method	Analyte	% Recovery	RPD	% Recovery Limits	Units
21L0146 21L0178	LCS/LCS dup (BJL0278-BS1) (BJL0278-BSD1)	EPA 8270E- SIM	1,4- Dioxane	37 / 42.6	14.20	39.9-120 / 30	µg/L
21L0271	LCS/LCS dup (BJL0519-BS1) (BJL0519-BSD1)	EPA 8270E- SIM	1,4- Dioxane	31.8/35.7	11.40	39.9-120 / 30	µg/L

5. MS/MSD recoveries were outside of acceptance criteria for select analytes, as summarized in the table below for project specific samples. Using professional judgment, when only one QC indicator (MS/MSD/RPD) did not meet QC criteria, qualification was not required. When recoveries were greater than the upper control limit and associated sample results were non-detect, data were not qualified.

The MS/MSD results for 2-chloroethyl vinyl ether were non-detect and the lab did not calculate both the recoveries and RPD. Samples were collected in preserved VOA vials and the recovery was most likely lost due to the acid-labile nature of 2-chloroethyl vinyl ether. Following Guidelines and using professional judgment, when the MS/MSD results were ND and the calculated percent recovery of the associated MS/MSD did not recover (NR), the associated non-detect results were rejected (R).

Primary Sample Name	Parameter	Analyte	MS/MSD % Recovery	RPD	% Recovery / RPD Criteria
LMW-4-1221	SW8260D	2-Chloroethyl vinyl ether	ND/ND	-	64-120/30
LMW-4-1221	SW6010D	Magnesium <sup>a</sup>	71.6/31.4	5.21	75-125/20
LMW-4-1221	SW6010D	Calcium <sup>a</sup>	138/78.4	4.75	75-125/20
LMW-7-1221	SW6010D	Magnesium <sup>a</sup>	127/139	3.93	75-125/20
LMW-7-1221	SW6010D	Sodium	10.8/40.2	3.91	75-125/20

Notes:

<sup>a</sup> – Concentration in the parent sample was greater than 4x the spiking concentration

6. The data reviewer observed that all of the samples collected in the field, with the exception of LMW-14-1221, contained low level detections of acetone ranging from 6.16 µg/L to 13.3 µg/L. A review of the previous quarterly rounds of data collected in 2021 did not identify the same detects of acetone. It is the professional judgment of the data reviewer that a potential contaminant was present in the VOA vials (possibly related to the septa) which caused the presence of acetone in the samples. The data reviewer has qualified all of the acetone results as non-detect (U) at the sample concentration.

Data qualification: See Table 2.

Definitions:

%R:	Percent Recovery	MSD:	Matrix Spike Duplicate
COC:	Chain of Custody	QAPP:	Quality Assurance Project Plan
CRQL:	Contract Required Quantitation Limit	QC:	Quality Control
DMC:	Deuterated Monitoring Compound	RL:	Reporting Limit
FB:	Field Blank	RPD:	Relative Percent Deviation
HT:	Holding Time	SD:	Serial Dilution
IS:	Internal Standard	SDG:	Sample Delivery Group
LCS:	Laboratory Control Sample	TAT:	Turn Around Time
LCSD:	Laboratory Control Sample Duplicate	TB:	Trip Blank
MB:	Method Blank	TPH:	Total Petroleum Hydrocarbons
MDL:	Method Detection Limit	VOC:	Volatile Organic Compound
MS:	Matrix Spike		

**APPENDIX B**

# Laboratory Analytical Report



**Analytical Resources, LLC**  
Analytical Chemists and Consultants

29 December 2021

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)  
21L0146

Associated SDG ID(s)  
N/A

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

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

Analytical Resources, LLC

Kelly Bottem, Client Services Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



# Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: <b>2110146</b>		Turn-around Requested: <b>Standard</b>			Date:							
ARI Client Company: <b>Golder</b>		Phone: <b>425-883-0777</b>			Page: <b>1</b> of <b>2</b>							
Client Contact: <b>Joseph Xi</b>		No. of Coolers:		Cooler Temps: <b>5.6, 3.1, 4.3, 1.2</b>								
Client Project Name: <b>Landsburg 2021 Q4 Sampling</b>					Analysis Requested							
Client Project #: <b>9231000007.2021</b>		Samplers: <b>T. Doggett C. Kubacki</b>			VOCS	Total Priority Metal	TPH-HCID	1,4-Dioxane	Dissolved Metals	Notes/Comments		
Sample ID	Date	Time	Matrix	No. Containers								
LMW-3-1221	12/7/21	1205	GW	11	X	X	X		X			
LMW-8-1221		1350	GW	11	X	X	X		X			
LMW-5-1221		1525	GW	11	X	X	X		X			
LMW-12-1221		1710	GW	13	X	X	X	X	X			
LMW-2-1221	12/8/21	1125	GW	13	X	X	X	X	X			
LMW-2-1221-D		1130	GW	13	X	X	X	X	X			
LMW-4-1221		1250	GW	34	X	X	X	X	X	MS/MSD		
LMW-10-1221		1450	GW	13	X	X	X	X	X			
LMW-13R-1221		1550	GW	13	X	X	X	X	X			
LMW-FB-1221		1525	DI	12	X	X	X	X				
Comments/Special Instructions <b>HOLD DISSOLVED METALS AND TPH FOLLOW-UPS</b>	Relinquished by: (Signature) <i>Turner Doggett</i>			Received by: (Signature) <i>[Signature]</i>			Relinquished by: (Signature) <i>[Signature]</i>			Received by: (Signature) <i>[Signature]</i>		
	Printed Name: <b>Turner Doggett</b>			Printed Name:			Printed Name:			Printed Name: <b>Dimitri Komitov</b>		
	Company: <b>Golder</b>			Company:			Company:			Company: <b>ARI</b>		
	Date & Time: <b>12/08/21 1707</b>			Date & Time:			Date & Time:			Date & Time: <b>12/08/21 1707</b>		



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

**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:** Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.



# Chain of Custody Record & Laboratory Analysis Request



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

ARI Assigned Number: 2120146	Turn-around Requested: Standard	Date:
ARI Client Company: Golder	Phone: 425-883-0777	Page: 2 of 2
Client Contact: Joseph Xi	No. of Coolers:	Cooler Temps:

Client Project Name: Landsburg 2021 Q4 Sampling	Analysis Requested						Notes/Comments
Client Project #: 9231000007.2021	Samplers: T. Dogget C. Kubiacki	VOCs	Total Priority Metal	TPH-HCID	1,4-Dioxane		Analyze in accordance with MSA between Golder and ARI Ecology EIM EDD

Sample ID	Date	Time	Matrix	No. Containers	VOCs	Total Priority Metal	TPH-HCID	1,4-Dioxane											
Trip Blank-1221-1	12/8/21	1525	DI	3	X														Trip Blank

Comments/Special Instructions HOLD DISSOLVED METALS AND TPH FOLLOW-UPS	Relinquished by: (Signature) <i>Am</i>	Received by: (Signature) <i>D. L...</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Turner Dogget	Printed Name: Dante Kubiacki	Printed Name:	Printed Name:
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 12/8/2021 1707	Date & Time: 12/08/21 1707	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, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

**Sample Retention Policy:** Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.



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

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

**Reported:**  
29-Dec-2021 13:56

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
LMW-3-1221	21L0146-01	Water	07-Dec-2021 12:05	08-Dec-2021 17:07
LMW-8-1221	21L0146-03	Water	07-Dec-2021 13:50	08-Dec-2021 17:07
LMW-5-1221	21L0146-05	Water	07-Dec-2021 15:25	08-Dec-2021 17:07
LMW-12-1221	21L0146-07	Water	07-Dec-2021 17:10	08-Dec-2021 17:07
LMW-2-1221	21L0146-09	Water	08-Dec-2021 11:25	08-Dec-2021 17:07
LMW-2-1221-D	21L0146-11	Water	08-Dec-2021 11:30	08-Dec-2021 17:07
LMW-4-1221	21L0146-13	Water	08-Dec-2021 12:50	08-Dec-2021 17:07
LMW-10-1221	21L0146-15	Water	08-Dec-2021 14:50	08-Dec-2021 17:07
LMW-13R-1221	21L0146-17	Water	08-Dec-2021 15:50	08-Dec-2021 17:07
LMW-FB-1221	21L0146-19	Water	08-Dec-2021 15:25	08-Dec-2021 17:07
Trip Blank-1221-1	21L0146-20	Water	08-Dec-2021 15:25	08-Dec-2021 17:07



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

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

**Reported:**  
29-Dec-2021 13:56

## **Work Order Case Narrative**

### **Volatiles - EPA Method SW8260D**

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

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control high in the CCAL. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) spike recoveries and relative percent difference (RPD) were within advisory control limits with the exception of analytes flagged on the associated forms.

### **1,4-Dioxane- EPA Method SW8270E**

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

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

The matrix spike/matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

### **Total Metals - EPA Method 6010D 200.8 and 7470A**

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

Initial and continuing calibrations were within method requirements.





Golder Associates

18300 NE Union Hill Road Suite 200

Redmond WA, 98052-3333

Project: Landsburg

Project Number: Landsburg

Project Manager: Gary Zimmerman

**Reported:**

29-Dec-2021 13:56

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

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits. Due to the special project limits the U flags show up on the forms for the mercury spikes. The spike recoveries are in control and we are unable to edit out the "U" qualifiers.

#### **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.



WORK ORDER

21L0146

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates

Project Manager: Kelly Bottem

Project: Landsburg

Project Number: Landsburg

Preservation Confirmation

Container ID	Container Type	pH	
21L0146-01 A	HDPE NM, 500 mL, 1:1 HNO3	12	Pass (P)
21L0146-01 B	Glass NM, Amber, 500 mL		
21L0146-01 C	Glass NM, Amber, 500 mL		
21L0146-01 D	Glass NM, Amber, 500 mL		
21L0146-01 E	Glass NM, Amber, 500 mL		
21L0146-01 F	VOA Vial, Clear, 40 mL, HCL		
21L0146-01 G	VOA Vial, Clear, 40 mL, HCL		
21L0146-01 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-01 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-01 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	12	P
21L0146-03 A	HDPE NM, 500 mL, 1:1 HNO3	12	?
21L0146-03 B	Glass NM, Amber, 500 mL		
21L0146-03 C	Glass NM, Amber, 500 mL		
21L0146-03 D	Glass NM, Amber, 500 mL		
21L0146-03 E	Glass NM, Amber, 500 mL		
21L0146-03 F	VOA Vial, Clear, 40 mL, HCL		
21L0146-03 G	VOA Vial, Clear, 40 mL, HCL		
21L0146-03 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-03 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-03 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	12	P
21L0146-05 A	HDPE NM, 500 mL, 1:1 HNO3	12	P
21L0146-05 B	Glass NM, Amber, 500 mL		
21L0146-05 C	Glass NM, Amber, 500 mL		
21L0146-05 D	Glass NM, Amber, 500 mL		
21L0146-05 E	Glass NM, Amber, 500 mL		
21L0146-05 F	VOA Vial, Clear, 40 mL, HCL		
21L0146-05 G	VOA Vial, Clear, 40 mL, HCL		
21L0146-05 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-05 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-05 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	>2	Fail
21L0146-07 A	HDPE NM, 500 mL, 1:1 HNO3	12	P



WORK ORDER

21L0146

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates

Project Manager: Kelly Bottem

Project: Landsburg

Project Number: Landsburg

21L0146-07 B	Glass NM, Amber, 500 mL		
21L0146-07 C	Glass NM, Amber, 500 mL		
21L0146-07 D	Glass NM, Amber, 500 mL		
21L0146-07 E	Glass NM, Amber, 500 mL		
21L0146-07 F	Glass NM, Amber, 500 mL		
21L0146-07 G	Glass NM, Amber, 500 mL		
21L0146-07 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-07 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-07 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-07 K	VOA Vial, Clear, 40 mL, HCL		
21L0146-07 L	VOA Vial, Clear, 40 mL, HCL		
21L0146-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-09 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-09 B	Glass NM, Amber, 500 mL		
21L0146-09 C	Glass NM, Amber, 500 mL		
21L0146-09 D	Glass NM, Amber, 500 mL		
21L0146-09 E	Glass NM, Amber, 500 mL		
21L0146-09 F	Glass NM, Amber, 500 mL		
21L0146-09 G	Glass NM, Amber, 500 mL		
21L0146-09 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-09 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-09 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-09 K	VOA Vial, Clear, 40 mL, HCL		
21L0146-09 L	VOA Vial, Clear, 40 mL, HCL		
21L0146-10 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-11 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-11 B	Glass NM, Amber, 500 mL		
21L0146-11 C	Glass NM, Amber, 500 mL		
21L0146-11 D	Glass NM, Amber, 500 mL		
21L0146-11 E	Glass NM, Amber, 500 mL		
21L0146-11 F	Glass NM, Amber, 500 mL		
21L0146-11 G	Glass NM, Amber, 500 mL		
21L0146-11 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-11 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-11 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-11 K	VOA Vial, Clear, 40 mL, HCL		





**WORK ORDER**

21L0146

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

<b>Client: Golder Associates</b>	<b>Project Manager: Kelly Bottem</b>
<b>Project: Landsburg</b>	<b>Project Number: Landsburg</b>

21L0146-11 L	VOA Vial, Clear, 40 mL, HCL		
21L0146-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-13 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-13 AA	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AB	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AC	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AD	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AE	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AF	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AG	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AH	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AI	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 AJ	VOA Vial, Clear, 40 mL, HCL	bubble	
21L0146-13 B	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-13 C	HDPE NM, 500 mL, 1:1 HNO3	>2	Fail
21L0146-13 D	Glass NM, Amber, 500 mL		
21L0146-13 E	Glass NM, Amber, 500 mL		
21L0146-13 F	Glass NM, Amber, 500 mL		
21L0146-13 G	Glass NM, Amber, 500 mL		
21L0146-13 H	Glass NM, Amber, 500 mL		
21L0146-13 I	Glass NM, Amber, 500 mL		
21L0146-13 J	Glass NM, Amber, 500 mL		
21L0146-13 K	Glass NM, Amber, 500 mL		
21L0146-13 L	Glass NM, Amber, 500 mL		
21L0146-13 M	Glass NM, Amber, 500 mL		
21L0146-13 N	Glass NM, Amber, 500 mL		
21L0146-13 O	Glass NM, Amber, 500 mL		
21L0146-13 P	Glass NM, Amber, 500 mL		
21L0146-13 Q	Glass NM, Amber, 500 mL		
21L0146-13 R	Glass NM, Amber, 500 mL		
21L0146-13 S	Glass NM, Amber, 500 mL		
21L0146-13 T	Glass NM, Amber, 500 mL		
21L0146-13 U	Glass NM, Amber, 500 mL		
21L0146-13 V	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 W	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 X	VOA Vial, Clear, 40 mL, HCL		



WORK ORDER

21L0146

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

<b>Client: Golder Associates</b>	<b>Project Manager: Kelly Bottem</b>
<b>Project: Landsburg</b>	<b>Project Number: Landsburg</b>

21L0146-13 Y	VOA Vial, Clear, 40 mL, HCL		
21L0146-13 Z	VOA Vial, Clear, 40 mL, HCL		
21L0146-14 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-14 B	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-14 C	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-15 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-15 B	Glass NM, Amber, 500 mL		
21L0146-15 C	Glass NM, Amber, 500 mL		
21L0146-15 D	Glass NM, Amber, 500 mL		
21L0146-15 E	Glass NM, Amber, 500 mL		
21L0146-15 F	Glass NM, Amber, 500 mL		
21L0146-15 G	Glass NM, Amber, 500 mL		
21L0146-15 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-15 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-15 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-15 K	VOA Vial, Clear, 40 mL, HCL		
21L0146-15 L	VOA Vial, Clear, 40 mL, HCL		
21L0146-16 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-17 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-17 B	Glass NM, Amber, 500 mL		
21L0146-17 C	Glass NM, Amber, 500 mL		
21L0146-17 D	Glass NM, Amber, 500 mL		
21L0146-17 E	Glass NM, Amber, 500 mL		
21L0146-17 F	Glass NM, Amber, 500 mL		
21L0146-17 G	Glass NM, Amber, 500 mL		
21L0146-17 H	VOA Vial, Clear, 40 mL, HCL		
21L0146-17 I	VOA Vial, Clear, 40 mL, HCL		
21L0146-17 J	VOA Vial, Clear, 40 mL, HCL		
21L0146-17 K	VOA Vial, Clear, 40 mL, HCL		
21L0146-17 L	VOA Vial, Clear, 40 mL, HCL		
21L0146-18 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0146-19 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0146-19 B	Glass NM, Amber, 500 mL		
21L0146-19 C	Glass NM, Amber, 500 mL		
21L0146-19 D	Glass NM, Amber, 500 mL		
21L0146-19 E	Glass NM, Amber, 500 mL		



**WORK ORDER**

21L0146

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<b>Client: Golder Associates</b>	<b>Project Manager: Kelly Bottem</b>
<b>Project: Landsburg</b>	<b>Project Number: Landsburg</b>

21L0146-19 F	Glass NM, Amber, 500 mL
21L0146-19 G	Glass NM, Amber, 500 mL
21L0146-19 H	VOA Vial, Clear, 40 mL, HCL
21L0146-19 I	VOA Vial, Clear, 40 mL, HCL
21L0146-19 J	VOA Vial, Clear, 40 mL, HCL
21L0146-19 K	VOA Vial, Clear, 40 mL, HCL
21L0146-19 L	VOA Vial, Clear, 40 mL, HCL
21L0146-20 A	VOA Vial, Clear, 40 mL, HCL
21L0146-20 B	VOA Vial, Clear, 40 mL, HCL
21L0146-20 C	VOA Vial, Clear, 40 mL, HCL



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12/10/21

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Preservation Confirmed By

Date





# Cooler Receipt Form

ARI Client: Golda  
 COC No(s): \_\_\_\_\_ NA  
 Assigned ARI Job No: 21L0146

Project Name: Landsburg 2021 Q4 Sampling  
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
 Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO  
 Were custody papers included with the cooler? YES NO  
 Were custody papers properly filled out (ink, signed, etc.) YES NO  
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1707 5.6 3.1 9.3 1.2  
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: DOO 2565

Cooler Accepted by: DC Date: 12/10/21 Time: 1707

**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 12/6/21  
 Were the sample(s) split NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: RD Date: 12/10/21 Time: 1212 Labels checked by: \_\_\_\_\_

**\*\* 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:**

Dissolved metals bottle for sample LMW-3-1221 doesnt have FF/Field Filtered written on it, but it has HNO3 & the other dissolved metals have FF so assumed it was also filtered.

By: RD Date: 12/10/21



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

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

**Reported:**  
29-Dec-2021 13:56

**LMW-3-1221**  
**21L0146-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 12:05

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 13:44

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-01 I

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	5.00	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	8.03	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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





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Reported:  
29-Dec-2021 13:56

**LMW-3-1221**  
**21L0146-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 12:05

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 13:44

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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Redmond WA, 98052-3333

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

**Reported:**  
29-Dec-2021 13:56

**LMW-3-1221**  
**21L0146-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 12:05

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 13:44

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	96.5	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	98.9	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			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	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-3-1221**  
**21L0146-01 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/07/2021 12:05  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 18:01

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-01 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	108	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	110	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-3-1221**  
**21L0146-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/07/2021 12:05  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:07

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-01 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-3-1221**  
**21L0146-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/07/2021 12:05  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:07

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-01 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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Redmond WA, 98052-3333

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

**Reported:**  
29-Dec-2021 13:56

**LMW-3-1221**  
**21L0146-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/07/2021 12:05

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 15:41

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-01 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	37.6	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	ND	mg/L	U
Magnesium	7439-95-4	1	0.500	15.3	mg/L	
Manganese	7439-96-5	1	0.0100	0.0453	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	1.72	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	9.96	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-3-1221**  
**21L0146-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/07/2021 12:05  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:25

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-01 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/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:**  
29-Dec-2021 13:56

**LMW-8-1221**  
**21L0146-03 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 13:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 14:09

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-03 H

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	5.00	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	7.59	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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





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

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

Reported:  
29-Dec-2021 13:56

**LMW-8-1221**  
**21L0146-03 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 13:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 14:09

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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

**Reported:**  
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**LMW-8-1221**  
**21L0146-03 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 13:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 14:09

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	101	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	102	%	



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**LMW-8-1221**  
**21L0146-03 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/07/2021 13:50  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 18:21

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-03 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	85.2	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	94.0	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-8-1221**  
**21L0146-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/07/2021 13:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:13

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-03 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-8-1221**  
**21L0146-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/07/2021 13:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:13

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-03 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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

**Reported:**  
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**LMW-8-1221**  
**21L0146-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/07/2021 13:50

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 15:43

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-03 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	49.2	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	8.99	mg/L	
Magnesium	7439-95-4	1	0.500	26.5	mg/L	
Manganese	7439-96-5	1	0.0100	0.315	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	1.68	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	9.65	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-8-1221**  
**21L0146-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/07/2021 13:50  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:28

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-03 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



Golder Associates  
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Redmond WA, 98052-3333

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

Reported:  
29-Dec-2021 13:56

**LMW-5-1221**  
**21L0146-05 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 14:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-05 H

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	5.00	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	8.03	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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





Golder Associates  
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Redmond WA, 98052-3333

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

**Reported:**  
29-Dec-2021 13:56

**LMW-5-1221**  
**21L0146-05 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 14:35

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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Redmond WA, 98052-3333

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

**Reported:**  
29-Dec-2021 13:56

**LMW-5-1221**  
**21L0146-05 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 14:35

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	99.6	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	102	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.9	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-5-1221**  
**21L0146-05 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/07/2021 15:25  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 18:40

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-05 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	93.2	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	102	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-5-1221**  
**21L0146-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/07/2021 15:25  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:19

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-05 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-5-1221**  
**21L0146-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/07/2021 15:25  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:19

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-05 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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Redmond WA, 98052-3333

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

**Reported:**  
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**LMW-5-1221**  
**21L0146-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/07/2021 15:25

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 15:46

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-05 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	85.5	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	0.455	mg/L	
Magnesium	7439-95-4	1	0.500	47.4	mg/L	
Manganese	7439-96-5	1	0.0100	0.203	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	2.47	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	14.7	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-5-1221**  
**21L0146-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/07/2021 15:25  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-05 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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Project: Landsburg  
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Project Manager: Gary Zimmerman

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**LMW-12-1221**  
**21L0146-07 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 17:10

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:00

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-07 I

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	1.34	ug/L	
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	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	6.16	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	1.17	ug/L	
2-Butanone	78-93-3	1	5.00	ND	ug/L	U
2,2-Dichloropropane	594-20-7	1	0.20	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	1.00	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





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**LMW-12-1221**  
**21L0146-07 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/07/2021 17:10

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:00

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-12-1221**  
**21L0146-07 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/07/2021 17:10  
Instrument: NT3 Analyst: PKC Analyzed: 12/13/2021 15:00

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	98.1	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.7	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	101	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	98.0	%	



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**LMW-12-1221**  
**21L0146-07 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/07/2021 17:10  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 16:05

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-07 D 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 Final Volume: 1 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
1,4-Dioxane	123-91-1	1	0.4	0.9	ug/L	
<i>Surrogate: 1,4-Dioxane-d8</i>			33.6-120 %	55.5	%	



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**LMW-12-1221**  
**21L0146-07 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/07/2021 17:10  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 19:00

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-07 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	90.7	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	95.0	%	



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**LMW-12-1221**  
**21L0146-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/07/2021 17:10  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:46

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-07 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-12-1221**  
**21L0146-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/07/2021 17:10  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:46

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-07 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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Project: Landsburg  
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**LMW-12-1221**  
**21L0146-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/07/2021 17:10

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 15:49

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-07 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	92.5	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	14.1	mg/L	
Magnesium	7439-95-4	1	0.500	56.4	mg/L	
Manganese	7439-96-5	1	0.0100	0.669	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	3.30	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	9.04	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U





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**LMW-12-1221**  
**21L0146-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/07/2021 17:10  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:33

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-07 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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

**Reported:**  
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**LMW-2-1221**  
**21L0146-09 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 11:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:25

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-09 I

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	5.00	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	13.0	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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Project Manager: Gary Zimmerman

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**LMW-2-1221**  
**21L0146-09 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 11:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:25

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



Golder Associates  
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Redmond WA, 98052-3333

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

**Reported:**  
29-Dec-2021 13:56

**LMW-2-1221**  
**21L0146-09 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 11:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:25

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	102	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.3	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.9	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-2-1221**  
**21L0146-09 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/08/2021 11:25  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 16:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-09 D 01  
Preparation Batch: B JL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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	
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>49.3</i>	<i>%</i>	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-2-1221**  
**21L0146-09 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/08/2021 11:25  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 19:20

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-09 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	92.3	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	102	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-2-1221**  
**21L0146-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/08/2021 11:25  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:52

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-09 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-2-1221**  
**21L0146-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/08/2021 11:25  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:52

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-09 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U





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

**Reported:**  
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**LMW-2-1221**  
**21L0146-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/08/2021 11:25

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 15:54

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-09 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	116	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	ND	mg/L	U
Magnesium	7439-95-4	1	0.500	72.9	mg/L	
Manganese	7439-96-5	1	0.0100	0.237	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	3.61	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	19.8	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-2-1221**  
**21L0146-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/08/2021 11:25  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-09 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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

**Reported:**  
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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 11:30

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:51

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: B JL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-11 H

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	5.00	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	6.86	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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

Reported:  
29-Dec-2021 13:56

**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 11:30

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:51

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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

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

**Reported:**  
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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 11:30

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 15:51

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	99.8	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.3	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	102	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.6	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/08/2021 11:30  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 16:55

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-11 D 01  
Preparation Batch: B JL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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	
<i>Surrogate: 1,4-Dioxane-d8</i>			33.6-120 %	52.1	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/08/2021 11:30  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 19:39

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-11 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	113	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	116	%	



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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/08/2021 11:30  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:57

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-11 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U





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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/08/2021 11:30  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 03:57

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-11 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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

**Reported:**  
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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/08/2021 11:30

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 15:57

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-11 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	118	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	ND	mg/L	U
Magnesium	7439-95-4	1	0.500	75.8	mg/L	
Manganese	7439-96-5	1	0.0100	0.217	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	3.67	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	20.1	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-2-1221-D**  
**21L0146-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/08/2021 11:30  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:37

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-11 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 12:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 16:16

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-13 X

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	0.20	ug/L	
Trichlorofluoromethane	75-69-4	1	0.20	ND	ug/L	U
Acrolein	107-02-8	1	5.00	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	8.09	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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LMW-4-1221  
21L0146-13 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/08/2021 12:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 16:16

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 12:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 16:16

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	100	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	101	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/08/2021 12:50  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 17:19

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-13 G 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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	
<i>Surrogate: 1,4-Dioxane-d8</i>			33.6-120 %	49.1	%	



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/08/2021 12:50  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 19:59

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-13 D 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	106	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	114	%	





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**LMW-4-1221**  
**21L0146-13 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/08/2021 12:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 04:12

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-13 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/08/2021 12:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 04:12

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-13 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/08/2021 12:50

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 16:05

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-13 C 01

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	114	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	0.654	mg/L	
Magnesium	7439-95-4	1	0.500	71.9	mg/L	
Manganese	7439-96-5	1	0.0100	0.206	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	3.62	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	21.2	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-4-1221**  
**21L0146-13 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/08/2021 12:50  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:08

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-13 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 14:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 16:41

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-15 H

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	5.00	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	13.3	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 14:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 16:41

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/08/2021 14:50  
Instrument: NT3 Analyst: PKC Analyzed: 12/13/2021 16:41

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	95.8	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.2	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	101	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	100	%	



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/08/2021 14:50  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 18:34

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-15 D 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>53.4</i>	<i>%</i>	





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**LMW-10-1221**  
**21L0146-15 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/08/2021 14:50  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 20:57

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-15 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	98.9	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	105	%	



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/08/2021 14:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 04:02

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-15 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/08/2021 14:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 04:02

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-15 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/08/2021 14:50

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 16:38

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-15 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	7.00	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	ND	mg/L	U
Magnesium	7439-95-4	1	0.500	2.94	mg/L	
Manganese	7439-96-5	1	0.0100	ND	mg/L	U
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	1.30	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	50.0	85.5	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-10-1221**  
**21L0146-15 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/08/2021 14:50  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:40

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-15 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:07

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-17 H

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	5.00	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	9.54	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:07

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:50

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:07

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	104	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	98.5	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.8	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	100	%	





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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/08/2021 15:50  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 18:59

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-17 D 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>50.7</i>	<i>%</i>	



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/08/2021 15:50  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 21:16

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-17 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	109	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	117	%	



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/08/2021 15:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 04:07

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-17 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/08/2021 15:50  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/16/2021 04:07

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-17 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/08/2021 15:50

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 16:41

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-17 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	87.0	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	1.12	mg/L	
Magnesium	7439-95-4	1	0.500	41.7	mg/L	
Manganese	7439-96-5	1	0.0100	0.0304	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	3.22	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	50.0	76.8	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-13R-1221**  
**21L0146-17 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/08/2021 15:50  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:42

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-17 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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

**Reported:**  
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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 13:19

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-19 J

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	5.00	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	7.80	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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

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

**Reported:**  
29-Dec-2021 13:56

**LMW-FB-1221**  
**21L0146-19 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 13:19

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U





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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/08/2021 15:25  
Instrument: NT3 Analyst: PKC Analyzed: 12/13/2021 13:19

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	102	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	100	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	97.6	%	



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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/08/2021 15:25  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 19:24

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0146-19 D 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>49.0</i>	<i>%</i>	



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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/08/2021 15:25  
Instrument: FID4 Analyst: TWC Analyzed: 12/13/2021 21:36

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0146-19 B 01  
Preparation Batch: BJL0272 Sample Size: 500 mL  
Prepared: 12/13/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	113	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	121	%	



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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/08/2021 15:25  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/17/2021 21:06

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-19 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/08/2021 15:25  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/17/2021 21:06

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0146-19 A 01  
Preparation Batch: BJL0366 Sample Size: 25 mL  
Prepared: 12/15/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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Project Manager: Gary Zimmerman

**Reported:**  
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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/08/2021 15:25

Instrument: ICP2 Analyst: MVP

Analyzed: 12/21/2021 16:44

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0477  
Prepared: 12/20/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0146-19 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	ND	mg/L	U
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	ND	mg/L	U
Magnesium	7439-95-4	1	0.500	ND	mg/L	U
Manganese	7439-96-5	1	0.0100	ND	mg/L	U
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	ND	mg/L	U
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	ND	mg/L	U
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-FB-1221**  
**21L0146-19 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/08/2021 15:25  
Instrument: HYDRA Analyst: SKD Analyzed: 12/20/2021 17:44

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0146-19 A  
Preparation Batch: BJL0484 Sample Size: 20 mL  
Prepared: 12/20/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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

**Reported:**  
29-Dec-2021 13:56

**Trip Blank-1221-1**  
**21L0146-20 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 12:54

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: B JL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0146-20 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	5.00	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
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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





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

Reported:  
29-Dec-2021 13:56

**Trip Blank-1221-1**  
**21L0146-20 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 12:54

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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Project: Landsburg  
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Project Manager: Gary Zimmerman

**Reported:**  
29-Dec-2021 13:56

**Trip Blank-1221-1**  
**21L0146-20 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/08/2021 15:25

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 12:54

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	99.2	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.5	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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Project: Landsburg  
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Project Manager: Gary Zimmerman

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0292-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 12:28								
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	5.00	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
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	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	0.20	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	1.00	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
trans-1,3-Dichloropropene	ND	0.20	ug/L							U



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Redmond WA, 98052-3333

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

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0292-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 12:28								
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	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.25	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	0.50	ug/L							U
Naphthalene	ND	0.50	ug/L							U



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Project: Landsburg  
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**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0292-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 12:28								
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.82		ug/L	5.00		96.4	80-129			
<i>Surrogate: Toluene-d8</i>	4.82		ug/L	5.00		96.3	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.95		ug/L	5.00		99.0	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.00		ug/L	5.00		99.9	80-120			
<b>LCS (BJL0292-BS1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:12								
Chloromethane	9.64	0.50	ug/L	10.0		96.4	60-138			
Vinyl Chloride	8.86	0.10	ug/L	10.0		88.6	66-133			
Bromomethane	9.19	1.00	ug/L	10.0		91.9	72-131			
Chloroethane	10.2	0.20	ug/L	10.0		102	60-155			
Trichlorofluoromethane	12.5	0.20	ug/L	10.0		125	62-141			Q
Acrolein	53.8	5.00	ug/L	50.0		108	52-190			
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.36	0.20	ug/L	10.0		93.6	76-129			
Acetone	51.6	5.00	ug/L	50.0		103	58-142			
1,1-Dichloroethene	9.40	0.20	ug/L	10.0		94.0	69-135			
Iodomethane	9.56	1.00	ug/L	10.0		95.6	56-147			
Methylene Chloride	9.63	1.00	ug/L	10.0		96.3	65-135			
Acrylonitrile	9.84	1.00	ug/L	10.0		98.4	64-134			
Carbon Disulfide	9.27	0.20	ug/L	10.0		92.7	78-125			
trans-1,2-Dichloroethene	9.67	0.20	ug/L	10.0		96.7	78-128			
Vinyl Acetate	10.1	0.20	ug/L	10.0		101	55-138			
1,1-Dichloroethane	9.52	0.20	ug/L	10.0		95.2	76-124			
2-Butanone	53.0	5.00	ug/L	50.0		106	61-140			
2,2-Dichloropropane	11.0	0.20	ug/L	10.0		110	66-147			
cis-1,2-Dichloroethene	9.27	0.20	ug/L	10.0		92.7	80-121			
Chloroform	9.53	0.20	ug/L	10.0		95.3	80-122			
Bromochloromethane	9.81	0.20	ug/L	10.0		98.1	80-121			
1,1,1-Trichloroethane	9.46	0.20	ug/L	10.0		94.6	79-123			
1,1-Dichloropropene	9.59	0.10	ug/L	10.0		95.9	80-127			
Carbon tetrachloride	9.99	0.20	ug/L	10.0		99.9	53-137			
1,2-Dichloroethane	9.80	0.20	ug/L	10.0		98.0	75-123			
Benzene	9.88	0.20	ug/L	10.0		98.8	80-120			
Trichloroethene	9.83	0.20	ug/L	10.0		98.3	80-120			



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Project: Landsburg  
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Project Manager: Gary Zimmerman

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0292-BS1)</b>				Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:12						
1,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	80-120			
Bromodichloromethane	9.63	0.20	ug/L	10.0		96.3	80-121			
Dibromomethane	10.1	0.20	ug/L	10.0		101	80-120			
2-Chloroethyl vinyl ether	10.4	1.00	ug/L	10.0		104	64-120			
4-Methyl-2-Pentanone	53.6	2.50	ug/L	50.0		107	67-133			
cis-1,3-Dichloropropene	9.73	0.20	ug/L	10.0		97.3	80-124			
Toluene	9.90	0.20	ug/L	10.0		99.0	80-120			
trans-1,3-Dichloropropene	10.0	0.20	ug/L	10.0		100	71-127			
2-Hexanone	53.5	5.00	ug/L	50.0		107	69-133			
1,1,2-Trichloroethane	9.59	0.20	ug/L	10.0		95.9	80-121			
1,3-Dichloropropane	9.64	0.10	ug/L	10.0		96.4	80-120			
Tetrachloroethene	9.44	0.20	ug/L	10.0		94.4	80-120			
Dibromochloromethane	9.98	0.20	ug/L	10.0		99.8	65-135			
1,2-Dibromoethane	10.2	0.10	ug/L	10.0		102	80-121			
Chlorobenzene	9.78	0.20	ug/L	10.0		97.8	80-120			
Ethylbenzene	9.74	0.20	ug/L	10.0		97.4	80-120			
1,1,1,2-Tetrachloroethane	9.56	0.20	ug/L	10.0		95.6	80-120			
m,p-Xylene	20.2	0.40	ug/L	20.0		101	80-121			
o-Xylene	9.87	0.20	ug/L	10.0		98.7	80-121			
Xylenes, total	30.0	0.60	ug/L	30.0		100	76-127			
Styrene	9.83	0.20	ug/L	10.0		98.3	80-124			
Bromoform	9.42	0.20	ug/L	10.0		94.2	51-134			
1,1,2,2-Tetrachloroethane	9.32	0.20	ug/L	10.0		93.2	77-123			
1,2,3-Trichloropropane	9.47	0.25	ug/L	10.0		94.7	76-125			
trans-1,4-Dichloro 2-Butene	10.0	1.00	ug/L	10.0		100	55-129			
n-Propylbenzene	9.82	0.20	ug/L	10.0		98.2	78-130			
Bromobenzene	9.55	0.20	ug/L	10.0		95.5	80-120			
Isopropyl Benzene	9.62	0.20	ug/L	10.0		96.2	80-128			
2-Chlorotoluene	9.38	0.10	ug/L	10.0		93.8	78-122			
4-Chlorotoluene	9.35	0.20	ug/L	10.0		93.5	80-121			
t-Butylbenzene	9.68	0.20	ug/L	10.0		96.8	78-125			
1,3,5-Trimethylbenzene	9.52	0.20	ug/L	10.0		95.2	80-129			
1,2,4-Trimethylbenzene	9.54	0.20	ug/L	10.0		95.4	80-127			
s-Butylbenzene	9.83	0.20	ug/L	10.0		98.3	78-129			
4-Isopropyl Toluene	9.83	0.20	ug/L	10.0		98.3	79-130			



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Project: Landsburg  
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Project Manager: Gary Zimmerman

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0292-BS1)</b>										
					Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:12					
1,3-Dichlorobenzene	9.54	0.20	ug/L	10.0		95.4	80-120			
1,4-Dichlorobenzene	9.60	0.20	ug/L	10.0		96.0	80-120			
n-Butylbenzene	9.87	0.20	ug/L	10.0		98.7	74-129			
1,2-Dichlorobenzene	9.69	0.20	ug/L	10.0		96.9	80-120			
1,2-Dibromo-3-chloropropane	10.2	0.50	ug/L	10.0		102	62-123			
1,2,4-Trichlorobenzene	10.2	0.50	ug/L	10.0		102	64-124			
Hexachloro-1,3-Butadiene	9.96	0.50	ug/L	10.0		99.6	58-123			
Naphthalene	10.9	0.50	ug/L	10.0		109	50-134			
1,2,3-Trichlorobenzene	10.4	0.50	ug/L	10.0		104	49-133			
Dichlorodifluoromethane	11.7	0.20	ug/L	10.0		117	48-147			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.90		ug/L	5.00		98.1	80-129			
<i>Surrogate: Toluene-d8</i>	4.94		ug/L	5.00		98.8	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.19		ug/L	5.00		104	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.99		ug/L	5.00		99.8	80-120			
<b>LCS Dup (BJL0292-BSD1)</b>										
					Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:38					
Chloromethane	9.02	0.50	ug/L	10.0		90.2	60-138	6.65	30	
Vinyl Chloride	8.81	0.10	ug/L	10.0		88.1	66-133	0.57	30	
Bromomethane	9.33	1.00	ug/L	10.0		93.3	72-131	1.52	30	
Chloroethane	9.86	0.20	ug/L	10.0		98.6	60-155	3.28	30	
Trichlorofluoromethane	10.6	0.20	ug/L	10.0		106	62-141	16.50	30	Q
Acrolein	48.5	5.00	ug/L	50.0		97.0	52-190	10.40	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.22	0.20	ug/L	10.0		92.2	76-129	1.49	30	
Acetone	47.1	5.00	ug/L	50.0		94.2	58-142	9.01	30	
1,1-Dichloroethene	9.10	0.20	ug/L	10.0		91.0	69-135	3.23	30	
Iodomethane	9.58	1.00	ug/L	10.0		95.8	56-147	0.17	30	
Methylene Chloride	9.79	1.00	ug/L	10.0		97.9	65-135	1.63	30	
Acrylonitrile	9.44	1.00	ug/L	10.0		94.4	64-134	4.22	30	
Carbon Disulfide	9.18	0.20	ug/L	10.0		91.8	78-125	1.04	30	
trans-1,2-Dichloroethene	9.58	0.20	ug/L	10.0		95.8	78-128	0.89	30	
Vinyl Acetate	9.59	0.20	ug/L	10.0		95.9	55-138	5.09	30	
1,1-Dichloroethane	9.57	0.20	ug/L	10.0		95.7	76-124	0.54	30	
2-Butanone	47.9	5.00	ug/L	50.0		95.8	61-140	10.10	30	
2,2-Dichloropropane	10.9	0.20	ug/L	10.0		109	66-147	0.60	30	
cis-1,2-Dichloroethene	9.17	0.20	ug/L	10.0		91.7	80-121	1.15	30	



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**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BJL0292-BSD1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:38								
Chloroform	9.29	0.20	ug/L	10.0		92.9	80-122	2.53	30	
Bromochloromethane	9.44	0.20	ug/L	10.0		94.4	80-121	3.81	30	
1,1,1-Trichloroethane	9.45	0.20	ug/L	10.0		94.5	79-123	0.10	30	
1,1-Dichloropropene	9.22	0.10	ug/L	10.0		92.2	80-127	3.85	30	
Carbon tetrachloride	9.49	0.20	ug/L	10.0		94.9	53-137	5.04	30	
1,2-Dichloroethane	9.18	0.20	ug/L	10.0		91.8	75-123	6.57	30	
Benzene	9.26	0.20	ug/L	10.0		92.6	80-120	6.54	30	
Trichloroethene	9.38	0.20	ug/L	10.0		93.8	80-120	4.69	30	
1,2-Dichloropropane	9.58	0.20	ug/L	10.0		95.8	80-120	5.68	30	
Bromodichloromethane	9.14	0.20	ug/L	10.0		91.4	80-121	5.16	30	
Dibromomethane	9.45	0.20	ug/L	10.0		94.5	80-120	6.40	30	
2-Chloroethyl vinyl ether	9.78	1.00	ug/L	10.0		97.8	64-120	6.47	30	
4-Methyl-2-Pentanone	48.3	2.50	ug/L	50.0		96.6	67-133	10.40	30	
cis-1,3-Dichloropropene	9.20	0.20	ug/L	10.0		92.0	80-124	5.62	30	
Toluene	9.31	0.20	ug/L	10.0		93.1	80-120	6.16	30	
trans-1,3-Dichloropropene	9.34	0.20	ug/L	10.0		93.4	71-127	7.11	30	
2-Hexanone	48.1	5.00	ug/L	50.0		96.2	69-133	10.60	30	
1,1,2-Trichloroethane	8.88	0.20	ug/L	10.0		88.8	80-121	7.74	30	
1,3-Dichloropropane	9.10	0.10	ug/L	10.0		91.0	80-120	5.73	30	
Tetrachloroethene	9.21	0.20	ug/L	10.0		92.1	80-120	2.55	30	
Dibromochloromethane	9.43	0.20	ug/L	10.0		94.3	65-135	5.73	30	
1,2-Dibromoethane	9.33	0.10	ug/L	10.0		93.3	80-121	8.59	30	
Chlorobenzene	9.46	0.20	ug/L	10.0		94.6	80-120	3.40	30	
Ethylbenzene	9.21	0.20	ug/L	10.0		92.1	80-120	5.53	30	
1,1,1,2-Tetrachloroethane	9.15	0.20	ug/L	10.0		91.5	80-120	4.34	30	
m,p-Xylene	18.6	0.40	ug/L	20.0		92.9	80-121	8.16	30	
o-Xylene	9.23	0.20	ug/L	10.0		92.3	80-121	6.71	30	
Xylenes, total	27.8	0.60	ug/L	30.0		92.7	76-127	7.68	30	
Styrene	9.51	0.20	ug/L	10.0		95.1	80-124	3.26	30	
Bromoform	8.89	0.20	ug/L	10.0		88.9	51-134	5.75	30	
1,1,2,2-Tetrachloroethane	8.44	0.20	ug/L	10.0		84.4	77-123	9.92	30	
1,2,3-Trichloropropane	8.40	0.25	ug/L	10.0		84.0	76-125	12.00	30	
trans-1,4-Dichloro 2-Butene	9.18	1.00	ug/L	10.0		91.8	55-129	8.60	30	
n-Propylbenzene	9.45	0.20	ug/L	10.0		94.5	78-130	3.80	30	
Bromobenzene	9.14	0.20	ug/L	10.0		91.4	80-120	4.37	30	





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Reported:  
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Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJL0292 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BJL0292-BSD1)</b>				Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:38						
Isopropyl Benzene	9.30	0.20	ug/L	10.0		93.0	80-128	3.39	30	
2-Chlorotoluene	8.85	0.10	ug/L	10.0		88.5	78-122	5.78	30	
4-Chlorotoluene	8.80	0.20	ug/L	10.0		88.0	80-121	6.07	30	
t-Butylbenzene	9.28	0.20	ug/L	10.0		92.8	78-125	4.25	30	
1,3,5-Trimethylbenzene	9.06	0.20	ug/L	10.0		90.6	80-129	4.94	30	
1,2,4-Trimethylbenzene	9.25	0.20	ug/L	10.0		92.5	80-127	3.08	30	
s-Butylbenzene	9.41	0.20	ug/L	10.0		94.1	78-129	4.37	30	
4-Isopropyl Toluene	9.47	0.20	ug/L	10.0		94.7	79-130	3.71	30	
1,3-Dichlorobenzene	9.13	0.20	ug/L	10.0		91.3	80-120	4.46	30	
1,4-Dichlorobenzene	9.04	0.20	ug/L	10.0		90.4	80-120	5.92	30	
n-Butylbenzene	9.50	0.20	ug/L	10.0		95.0	74-129	3.87	30	
1,2-Dichlorobenzene	9.09	0.20	ug/L	10.0		90.9	80-120	6.37	30	
1,2-Dibromo-3-chloropropane	9.25	0.50	ug/L	10.0		92.5	62-123	9.35	30	
1,2,4-Trichlorobenzene	9.69	0.50	ug/L	10.0		96.9	64-124	5.14	30	
Hexachloro-1,3-Butadiene	9.67	0.50	ug/L	10.0		96.7	58-123	3.00	30	
Naphthalene	9.73	0.50	ug/L	10.0		97.3	50-134	11.70	30	
1,2,3-Trichlorobenzene	9.58	0.50	ug/L	10.0		95.8	49-133	8.42	30	
Dichlorodifluoromethane	11.7	0.20	ug/L	10.0		117	48-147	0.05	30	
Surrogate: 1,2-Dichloroethane-d4	5.19		ug/L	5.00		104	80-129			
Surrogate: Toluene-d8	5.03		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.01		ug/L	5.00		100	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.87		ug/L	5.00		97.4	80-120			
<b>Matrix Spike (BJL0292-MS1)</b>				Source: 21L0146-13 Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 20:28						
Chloromethane	9.83	0.50	ug/L	10.0	ND	98.3	60-138			
Vinyl Chloride	8.81	0.10	ug/L	10.0	ND	88.1	66-133			
Bromomethane	10.7	1.00	ug/L	10.0	ND	107	72-131			
Chloroethane	12.3	0.20	ug/L	10.0	0.20	121	60-155			
Trichlorofluoromethane	12.9	0.20	ug/L	10.0	ND	129	62-141			Q
Acrolein	47.9	5.00	ug/L	50.0	ND	95.9	52-190			
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.1	0.20	ug/L	10.0	ND	101	76-129			
Acetone	66.2	5.00	ug/L	50.0	8.09	116	58-142			
1,1-Dichloroethene	10.7	0.20	ug/L	10.0	ND	107	69-135			
Iodomethane	11.2	1.00	ug/L	10.0	ND	112	56-147			
Methylene Chloride	11.1	1.00	ug/L	10.0	ND	111	65-135			



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

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

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BJL0292-MS1)</b>										
		<b>Source: 21L0146-13</b>			Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 20:28			
Acrylonitrile	11.2	1.00	ug/L	10.0	ND	112	64-134			
Carbon Disulfide	10.5	0.20	ug/L	10.0	ND	105	78-125			
trans-1,2-Dichloroethene	10.8	0.20	ug/L	10.0	ND	108	78-128			
Vinyl Acetate	9.43	0.20	ug/L	10.0	ND	94.3	55-138			
1,1-Dichloroethane	11.1	0.20	ug/L	10.0	ND	111	76-124			
2-Butanone	58.7	5.00	ug/L	50.0	ND	117	61-140			
2,2-Dichloropropane	10.6	0.20	ug/L	10.0	ND	106	66-147			
cis-1,2-Dichloroethene	10.8	0.20	ug/L	10.0	ND	108	80-121			
Chloroform	11.0	0.20	ug/L	10.0	ND	110	80-122			
Bromochloromethane	11.2	0.20	ug/L	10.0	ND	112	80-121			
1,1,1-Trichloroethane	11.0	0.20	ug/L	10.0	ND	110	79-123			
1,1-Dichloropropene	10.6	0.10	ug/L	10.0	ND	106	80-127			
Carbon tetrachloride	10.9	0.20	ug/L	10.0	ND	109	53-137			
1,2-Dichloroethane	11.2	0.20	ug/L	10.0	ND	112	75-123			
Benzene	10.9	0.20	ug/L	10.0	ND	109	80-120			
Trichloroethene	11.1	0.20	ug/L	10.0	ND	111	80-120			
1,2-Dichloropropane	11.3	0.20	ug/L	10.0	ND	113	80-120			
Bromodichloromethane	10.9	0.20	ug/L	10.0	ND	109	80-121			
Dibromomethane	11.5	0.20	ug/L	10.0	ND	114	80-120			
2-Chloroethyl vinyl ether	ND	1.00	ug/L	10.0	ND		64-120			*, U
4-Methyl-2-Pentanone	58.3	2.50	ug/L	50.0	ND	117	67-133			
cis-1,3-Dichloropropene	10.3	0.20	ug/L	10.0	ND	103	80-124			
Toluene	10.9	0.20	ug/L	10.0	ND	109	80-120			
trans-1,3-Dichloropropene	10.6	0.20	ug/L	10.0	ND	106	71-127			
2-Hexanone	59.3	5.00	ug/L	50.0	ND	119	69-133			
1,1,2-Trichloroethane	10.7	0.20	ug/L	10.0	ND	107	80-121			
1,3-Dichloropropane	11.0	0.10	ug/L	10.0	ND	110	80-120			
Tetrachloroethene	10.6	0.20	ug/L	10.0	ND	106	80-120			
Dibromochloromethane	10.8	0.20	ug/L	10.0	ND	108	65-135			
1,2-Dibromoethane	11.5	0.10	ug/L	10.0	ND	115	80-121			
Chlorobenzene	11.0	0.20	ug/L	10.0	ND	110	80-120			
Ethylbenzene	11.0	0.20	ug/L	10.0	ND	110	80-120			
1,1,1,2-Tetrachloroethane	10.9	0.20	ug/L	10.0	ND	109	80-120			
m,p-Xylene	22.2	0.40	ug/L	20.0	ND	111	80-121			
o-Xylene	10.8	0.20	ug/L	10.0	ND	108	80-121			



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

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BJL0292-MS1)</b>										
		<b>Source: 21L0146-13</b>		Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 20:28				
Xylenes, total	33.0	0.60	ug/L	30.0	ND	110	76-127			
Styrene	9.51	0.20	ug/L	10.0	ND	95.1	80-124			
Bromoform	9.86	0.20	ug/L	10.0	ND	98.6	51-134			
1,1,2,2-Tetrachloroethane	10.3	0.20	ug/L	10.0	ND	103	77-123			
1,2,3-Trichloropropane	10.2	0.25	ug/L	10.0	ND	102	76-125			
trans-1,4-Dichloro 2-Butene	8.98	1.00	ug/L	10.0	ND	89.8	55-129			
n-Propylbenzene	10.8	0.20	ug/L	10.0	ND	108	78-130			
Bromobenzene	11.0	0.20	ug/L	10.0	ND	110	80-120			
Isopropyl Benzene	10.8	0.20	ug/L	10.0	ND	108	80-128			
2-Chlorotoluene	10.6	0.10	ug/L	10.0	ND	106	78-122			
4-Chlorotoluene	10.5	0.20	ug/L	10.0	ND	105	80-121			
t-Butylbenzene	11.0	0.20	ug/L	10.0	ND	110	78-125			
1,3,5-Trimethylbenzene	10.6	0.20	ug/L	10.0	ND	106	80-129			
1,2,4-Trimethylbenzene	10.5	0.20	ug/L	10.0	ND	105	80-127			
s-Butylbenzene	10.9	0.20	ug/L	10.0	ND	109	78-129			
4-Isopropyl Toluene	10.8	0.20	ug/L	10.0	ND	108	79-130			
1,3-Dichlorobenzene	10.8	0.20	ug/L	10.0	ND	108	80-120			
1,4-Dichlorobenzene	10.7	0.20	ug/L	10.0	ND	107	80-120			
n-Butylbenzene	10.7	0.20	ug/L	10.0	ND	107	74-129			
1,2-Dichlorobenzene	10.9	0.20	ug/L	10.0	ND	109	80-120			
1,2-Dibromo-3-chloropropane	11.1	0.50	ug/L	10.0	ND	111	62-123			
1,2,4-Trichlorobenzene	11.4	0.50	ug/L	10.0	ND	114	64-124			
Hexachloro-1,3-Butadiene	10.6	0.50	ug/L	10.0	ND	106	58-123			
Naphthalene	11.6	0.50	ug/L	10.0	ND	116	50-134			
1,2,3-Trichlorobenzene	11.6	0.50	ug/L	10.0	ND	116	49-133			
Dichlorodifluoromethane	9.36	0.20	ug/L	10.0	ND	93.6	48-147			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.04		ug/L	5.00	5.00	101	80-129			
<i>Surrogate: Toluene-d8</i>	4.94		ug/L	5.00	5.04	98.8	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.12		ug/L	5.00	5.07	102	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.92		ug/L	5.00	5.05	98.5	80-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0292-MSD1)</b>										
		<b>Source: 21L0146-13</b>		Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 20:53				
Chloromethane	9.22	0.50	ug/L	10.0	ND	92.2	60-138	6.39	30	



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

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike Dup (BJL0292-MSD1)</b>										
<b>Source: 21L0146-13</b>			<b>Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 20:53</b>							
Vinyl Chloride	7.84	0.10	ug/L	10.0	ND	78.4	66-133	11.80	30	
Bromomethane	9.37	1.00	ug/L	10.0	ND	93.7	72-131	12.80	30	
Chloroethane	10.9	0.20	ug/L	10.0	0.20	107	60-155	12.10	30	
Trichlorofluoromethane	11.9	0.20	ug/L	10.0	ND	119	62-141	7.99	30	Q
Acrolein	42.8	5.00	ug/L	50.0	ND	85.6	52-190	11.30	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.13	0.20	ug/L	10.0	ND	91.3	76-129	9.79	30	
Acetone	59.6	5.00	ug/L	50.0	8.09	103	58-142	10.50	30	
1,1-Dichloroethene	9.41	0.20	ug/L	10.0	ND	94.1	69-135	13.20	30	
Iodomethane	9.66	1.00	ug/L	10.0	ND	96.6	56-147	14.40	30	
Methylene Chloride	9.64	1.00	ug/L	10.0	ND	96.4	65-135	14.50	30	
Acrylonitrile	9.98	1.00	ug/L	10.0	ND	99.8	64-134	11.10	30	
Carbon Disulfide	9.21	0.20	ug/L	10.0	ND	92.1	78-125	13.30	30	
trans-1,2-Dichloroethene	9.43	0.20	ug/L	10.0	ND	94.3	78-128	14.00	30	
Vinyl Acetate	7.87	0.20	ug/L	10.0	ND	78.7	55-138	17.90	30	
1,1-Dichloroethane	9.75	0.20	ug/L	10.0	ND	97.5	76-124	13.20	30	
2-Butanone	53.6	5.00	ug/L	50.0	ND	107	61-140	9.04	30	
2,2-Dichloropropane	9.22	0.20	ug/L	10.0	ND	92.2	66-147	13.50	30	
cis-1,2-Dichloroethene	9.43	0.20	ug/L	10.0	ND	94.3	80-121	13.50	30	
Chloroform	9.61	0.20	ug/L	10.0	ND	96.1	80-122	13.90	30	
Bromochloromethane	9.84	0.20	ug/L	10.0	ND	98.4	80-121	13.10	30	
1,1,1-Trichloroethane	9.68	0.20	ug/L	10.0	ND	96.8	79-123	12.40	30	
1,1-Dichloropropene	9.73	0.10	ug/L	10.0	ND	97.3	80-127	8.73	30	
Carbon tetrachloride	9.94	0.20	ug/L	10.0	ND	99.4	53-137	9.05	30	
1,2-Dichloroethane	10.3	0.20	ug/L	10.0	ND	103	75-123	9.02	30	
Benzene	9.73	0.20	ug/L	10.0	ND	97.3	80-120	11.20	30	
Trichloroethene	9.84	0.20	ug/L	10.0	ND	98.4	80-120	12.40	30	
1,2-Dichloropropane	10.3	0.20	ug/L	10.0	ND	103	80-120	9.11	30	
Bromodichloromethane	9.68	0.20	ug/L	10.0	ND	96.8	80-121	11.50	30	
Dibromomethane	9.98	0.20	ug/L	10.0	ND	99.0	80-120	14.30	30	
2-Chloroethyl vinyl ether	ND	1.00	ug/L	10.0	ND		64-120			*, U
4-Methyl-2-Pentanone	54.4	2.50	ug/L	50.0	ND	109	67-133	6.82	30	
cis-1,3-Dichloropropene	9.33	0.20	ug/L	10.0	ND	93.3	80-124	10.20	30	
Toluene	9.79	0.20	ug/L	10.0	ND	97.9	80-120	10.80	30	
trans-1,3-Dichloropropene	9.42	0.20	ug/L	10.0	ND	94.2	71-127	11.70	30	
2-Hexanone	54.9	5.00	ug/L	50.0	ND	110	69-133	7.70	30	



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

**Reported:**  
29-Dec-2021 13:56

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike Dup (BJL0292-MSD1)</b>										
		<b>Source: 21L0146-13</b>			Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 20:53			
1,1,2-Trichloroethane	9.48	0.20	ug/L	10.0	ND	94.8	80-121	12.00	30	
1,3-Dichloropropane	10.0	0.10	ug/L	10.0	ND	100	80-120	9.64	30	
Tetrachloroethene	9.61	0.20	ug/L	10.0	ND	96.1	80-120	9.51	30	
Dibromochloromethane	10.0	0.20	ug/L	10.0	ND	100	65-135	7.31	30	
1,2-Dibromoethane	10.4	0.10	ug/L	10.0	ND	104	80-121	10.70	30	
Chlorobenzene	9.94	0.20	ug/L	10.0	ND	99.4	80-120	9.96	30	
Ethylbenzene	9.61	0.20	ug/L	10.0	ND	96.1	80-120	13.30	30	
1,1,1,2-Tetrachloroethane	9.74	0.20	ug/L	10.0	ND	97.4	80-120	10.90	30	
m,p-Xylene	19.7	0.40	ug/L	20.0	ND	98.7	80-121	11.70	30	
o-Xylene	9.74	0.20	ug/L	10.0	ND	97.4	80-121	10.20	30	
Xylenes, total	29.5	0.60	ug/L	30.0	ND	98.3	76-127	11.20	30	
Styrene	8.33	0.20	ug/L	10.0	ND	83.3	80-124	13.20	30	
Bromoform	9.12	0.20	ug/L	10.0	ND	91.2	51-134	7.73	30	
1,1,2,2-Tetrachloroethane	9.59	0.20	ug/L	10.0	ND	95.9	77-123	6.69	30	
1,2,3-Trichloropropane	9.98	0.25	ug/L	10.0	ND	99.8	76-125	2.58	30	
trans-1,4-Dichloro 2-Butene	8.13	1.00	ug/L	10.0	ND	81.3	55-129	9.89	30	
n-Propylbenzene	9.87	0.20	ug/L	10.0	ND	98.7	78-130	9.13	30	
Bromobenzene	9.80	0.20	ug/L	10.0	ND	98.0	80-120	11.30	30	
Isopropyl Benzene	9.89	0.20	ug/L	10.0	ND	98.9	80-128	9.18	30	
2-Chlorotoluene	9.67	0.10	ug/L	10.0	ND	96.7	78-122	8.92	30	
4-Chlorotoluene	9.44	0.20	ug/L	10.0	ND	94.4	80-121	10.40	30	
t-Butylbenzene	10.0	0.20	ug/L	10.0	ND	100	78-125	8.66	30	
1,3,5-Trimethylbenzene	9.60	0.20	ug/L	10.0	ND	96.0	80-129	9.49	30	
1,2,4-Trimethylbenzene	9.57	0.20	ug/L	10.0	ND	95.7	80-127	9.39	30	
s-Butylbenzene	9.96	0.20	ug/L	10.0	ND	99.6	78-129	9.28	30	
4-Isopropyl Toluene	9.90	0.20	ug/L	10.0	ND	99.0	79-130	9.06	30	
1,3-Dichlorobenzene	9.77	0.20	ug/L	10.0	ND	97.7	80-120	9.93	30	
1,4-Dichlorobenzene	9.76	0.20	ug/L	10.0	ND	97.6	80-120	8.88	30	
n-Butylbenzene	9.94	0.20	ug/L	10.0	ND	99.4	74-129	7.32	30	
1,2-Dichlorobenzene	9.85	0.20	ug/L	10.0	ND	98.5	80-120	10.20	30	
1,2-Dibromo-3-chloropropane	9.96	0.50	ug/L	10.0	ND	99.6	62-123	10.60	30	
1,2,4-Trichlorobenzene	10.5	0.50	ug/L	10.0	ND	105	64-124	8.70	30	
Hexachloro-1,3-Butadiene	10.2	0.50	ug/L	10.0	ND	102	58-123	3.31	30	
Naphthalene	11.0	0.50	ug/L	10.0	ND	110	50-134	5.43	30	
1,2,3-Trichlorobenzene	11.0	0.50	ug/L	10.0	ND	110	49-133	5.56	30	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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Analysis by: Analytical Resources, LLC

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike Dup (BJL0292-MSD1)</b>		<b>Source: 21L0146-13</b>		Prepared: 13-Dec-2021		Analyzed: 13-Dec-2021 20:53				
Dichlorodifluoromethane	9.32	0.20	ug/L	10.0	ND	93.2	48-147	0.44	30	
Surrogate: 1,2-Dichloroethane-d4	4.82		ug/L	5.00	5.00	96.5	80-129			
Surrogate: Toluene-d8	5.07		ug/L	5.00	5.04	101	80-120			
Surrogate: 4-Bromofluorobenzene	5.22		ug/L	5.00	5.07	104	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	5.05		ug/L	5.00	5.05	101	80-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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**Analysis by: Analytical Resources, LLC**

**Semivolatile Organic Compounds - SIM - Quality Control**

**Batch BJL0278 - EPA 3520C (Liq Liq)**

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0278-BLK1)</b>				Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 14:51						
1,4-Dioxane	ND	0.4	ug/L							U
<i>Surrogate: 1,4-Dioxane-d8</i>	2.53		ug/L	5.00		50.7	33.6-120			
<b>LCS (BJL0278-BS1)</b>				Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 15:16						
1,4-Dioxane	3.7	0.4	ug/L	10.0		37.0	39.9-120			*
<i>Surrogate: 1,4-Dioxane-d8</i>	2.53		ug/L	5.00		50.6	33.6-120			
<b>LCS Dup (BJL0278-BSD1)</b>				Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 15:41						
1,4-Dioxane	4.3	0.4	ug/L	10.0		42.6	39.9-120	14.20	30	
<i>Surrogate: 1,4-Dioxane-d8</i>	2.75		ug/L	5.00		55.0	33.6-120			
<b>Matrix Spike (BJL0278-MS1)</b>				<b>Source: 21L0146-13</b>		Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 17:44				
1,4-Dioxane	5.5	0.4	ug/L	10.0	1.6	39.6	35.1-120			
<i>Surrogate: 1,4-Dioxane-d8</i>	2.63		ug/L	5.00	2.45	52.6	33.6-120			
<b>Matrix Spike Dup (BJL0278-MSD1)</b>				<b>Source: 21L0146-13</b>		Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 18:09				
1,4-Dioxane	5.5	0.4	ug/L	10.0	1.6	39.4	35.1-120	0.20	30	
<i>Surrogate: 1,4-Dioxane-d8</i>	2.58		ug/L	5.00	2.45	51.5	33.6-120			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 29-Dec-2021 13:56
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Analysis by: Analytical Resources, LLC

**Petroleum Hydrocarbons - Quality Control**

**Batch BJL0272 - EPA 3510C SepF**

Instrument: FID4 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0272-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 17:03								
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: <i>o</i> -Terphenyl	129		mg/L	113	114		50-150			
Surrogate: <i>n</i> -Triacontane	138		mg/L	113	122		50-150			





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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0366 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0366-BLK1)</b>			Prepared: 15-Dec-2021 Analyzed: 15-Dec-2021 22:52								
Antimony	121	ND	0.00300	mg/L							U
Antimony	123	ND	0.00300	mg/L							U
Lead	208	ND	0.0100	mg/L							U
Thallium	205	ND	0.00200	mg/L							U
Arsenic	75a	ND	0.00300	mg/L							U
Selenium	78	ND	0.0250	mg/L							U
<b>LCS (BJL0366-BS1)</b>			Prepared: 15-Dec-2021 Analyzed: 15-Dec-2021 22:57								
Antimony	121	0.0262	0.00300	mg/L	0.0250		105	80-120			
Antimony	123	0.0262	0.00300	mg/L	0.0250		105	80-120			
Lead	208	0.0265	0.0100	mg/L	0.0250		106	80-120			
Thallium	205	0.0251	0.00200	mg/L	0.0250		100	80-120			
Arsenic	75a	0.0247	0.00300	mg/L	0.0250		98.6	80-120			
Selenium	78	0.0798	0.0250	mg/L	0.0800		99.7	80-120			
<b>Duplicate (BJL0366-DUP1)</b>			<b>Source: 21L0146-13</b>		Prepared: 15-Dec-2021 Analyzed: 16-Dec-2021 04:18						
Antimony	121	ND	0.00300	mg/L		ND					U
Lead	208	ND	0.0100	mg/L		ND					U
Thallium	205	ND	0.00200	mg/L		ND					U
Arsenic	75a	ND	0.00300	mg/L		ND					L, U
Selenium	78	ND	0.0250	mg/L		ND					U
<b>Matrix Spike (BJL0366-MS1)</b>			<b>Source: 21L0146-13</b>		Prepared: 15-Dec-2021 Analyzed: 16-Dec-2021 04:23						
Antimony	121	0.0262	0.00300	mg/L	0.0250	ND	105	75-125			
Lead	208	0.0244	0.0100	mg/L	0.0250	ND	97.4	75-125			
Thallium	205	0.0236	0.00200	mg/L	0.0250	ND	94.5	75-125			
Arsenic	75a	0.0249	0.00300	mg/L	0.0250	ND	99.5	75-125			
Selenium	78	0.0752	0.0250	mg/L	0.0800	ND	93.6	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
<b>Matrix Spike Dup (BJL0366-MSD1)</b>			<b>Source: 21L0146-13</b>		Prepared: 15-Dec-2021 Analyzed: 16-Dec-2021 04:30						
Antimony	121	0.0254	0.00300	mg/L	0.0250	ND	102	75-125	3.04	20	
Lead	208	0.0236	0.0100	mg/L	0.0250	ND	94.5	75-125	3.00	20	
Thallium	205	0.0228	0.00200	mg/L	0.0250	ND	91.2	75-125	3.57	20	
Arsenic	75a	0.0243	0.00300	mg/L	0.0250	ND	96.8	75-125	2.71	20	



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0366 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike Dup (BJL0366-MSD1)</b>			<b>Source: 21L0146-13</b>			Prepared: 15-Dec-2021 Analyzed: 16-Dec-2021 04:30					
Selenium	78	0.0713	0.0250	mg/L	0.0800	ND	88.7	75-125	5.32	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project Manager: Gary Zimmerman

**Reported:**  
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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0477 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0477-BLK1)</b>										
					Prepared: 20-Dec-2021 Analyzed: 21-Dec-2021 15:33					
Aluminum	ND	1.00	mg/L							U
Barium	ND	0.500	mg/L							U
Beryllium	ND	0.0100	mg/L							U
Cadmium	ND	0.0020	mg/L							U
Calcium	ND	0.500	mg/L							U
Chromium	ND	0.0100	mg/L							U
Cobalt	ND	0.0100	mg/L							U
Copper	ND	0.0030	mg/L							U
Magnesium	ND	0.500	mg/L							U
Manganese	ND	0.0100	mg/L							U
Nickel	ND	0.0100	mg/L							U
Potassium	ND	0.500	mg/L							U
Silver	ND	0.0050	mg/L							U
Sodium	ND	0.500	mg/L							U
Vanadium	ND	0.0030	mg/L							U
Zinc	ND	0.0200	mg/L							U

<b>Blank (BJL0477-BLK2)</b>										
					Prepared: 20-Dec-2021 Analyzed: 23-Dec-2021 14:10					
Iron	ND	0.200	mg/L							U

<b>LCS (BJL0477-BS1)</b>										
					Prepared: 20-Dec-2021 Analyzed: 21-Dec-2021 15:36					
Aluminum	2.10	1.00	mg/L	2.00		105	80-120			
Barium	2.03	0.500	mg/L	2.00		102	80-120			
Beryllium	0.518	0.0100	mg/L	0.500		104	80-120			
Cadmium	0.511	0.0020	mg/L	0.500		102	80-120			
Calcium	9.94	0.500	mg/L	10.0		99.4	80-120			
Chromium	0.503	0.0100	mg/L	0.500		101	80-120			
Cobalt	0.510	0.0100	mg/L	0.500		102	80-120			
Copper	0.494	0.0030	mg/L	0.500		98.8	80-120			
Magnesium	10.9	0.500	mg/L	10.0		109	80-120			
Manganese	0.511	0.0100	mg/L	0.500		102	80-120			
Nickel	0.522	0.0100	mg/L	0.500		104	80-120			
Potassium	10.3	0.500	mg/L	10.0		103	80-120			
Silver	0.532	0.0050	mg/L	0.500		106	80-120			
Sodium	10.3	0.500	mg/L	10.0		103	80-120			



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Project Manager: Gary Zimmerman

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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0477 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0477-BS1)</b>					Prepared: 20-Dec-2021 Analyzed: 21-Dec-2021 15:36					
Vanadium	0.508	0.0030	mg/L	0.500		102	80-120			
Zinc	0.514	0.0200	mg/L	0.500		103	80-120			
<b>LCS (BJL0477-BS2)</b>					Prepared: 20-Dec-2021 Analyzed: 23-Dec-2021 14:13					
Iron	1.96	0.200	mg/L	2.00		97.8	80-120			
<b>Duplicate (BJL0477-DUP1)</b>					Source: 21L0146-13 Prepared: 20-Dec-2021 Analyzed: 21-Dec-2021 16:00					
Aluminum	ND	1.00	mg/L		ND					U
Barium	ND	0.500	mg/L		ND					U
Beryllium	ND	0.0100	mg/L		ND					U
Cadmium	ND	0.0020	mg/L		ND					U
Calcium	117	0.500	mg/L		114			2.11	20	
Chromium	ND	0.0100	mg/L		ND					U
Cobalt	ND	0.0100	mg/L		ND					U
Copper	ND	0.0030	mg/L		ND					U
Magnesium	71.4	0.500	mg/L		71.9			0.69	20	
Manganese	0.203	0.0100	mg/L		0.206			1.93	20	
Nickel	ND	0.0100	mg/L		ND					U
Potassium	3.71	0.500	mg/L		3.62			2.52	20	
Silver	ND	0.0050	mg/L		ND					U
Sodium	21.6	0.500	mg/L		21.2			1.76	20	
Vanadium	ND	0.0030	mg/L		ND					U
Zinc	ND	0.0200	mg/L		ND					U
<b>Duplicate (BJL0477-DUP2)</b>					Source: 21L0146-13 Prepared: 20-Dec-2021 Analyzed: 23-Dec-2021 14:39					
Iron	0.660	0.200	mg/L		0.654			0.83	20	
<b>Matrix Spike (BJL0477-MS1)</b>					Source: 21L0146-13 Prepared: 20-Dec-2021 Analyzed: 21-Dec-2021 16:29					
Aluminum	2.14	1.00	mg/L	2.00	ND	107	75-125			
Barium	2.38	0.500	mg/L	2.00	ND	99.9	75-125			
Beryllium	0.532	0.0100	mg/L	0.500	ND	106	75-125			
Cadmium	0.537	0.0020	mg/L	0.500	ND	107	75-125			
Calcium	128	0.500	mg/L	10.0	114	138	75-125			HC
Chromium	0.515	0.0100	mg/L	0.500	ND	103	75-125			
Cobalt	0.512	0.0100	mg/L	0.500	ND	102	75-125			
Copper	0.457	0.0030	mg/L	0.500	ND	91.5	75-125			



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Project Manager: Gary Zimmerman

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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0477 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BJL0477-MS1)</b>										
		<b>Source: 21L0146-13</b>		Prepared: 20-Dec-2021		Analyzed: 21-Dec-2021 16:29				
Magnesium	79.0	0.500	mg/L	10.0	71.9	71.6	75-125			HC
Manganese	0.703	0.0100	mg/L	0.500	0.206	99.4	75-125			
Nickel	0.513	0.0100	mg/L	0.500	ND	103	75-125			
Potassium	14.5	0.500	mg/L	10.0	3.62	109	75-125			
Silver	0.505	0.0050	mg/L	0.500	ND	101	75-125			
Sodium	32.6	0.500	mg/L	10.0	21.2	114	75-125			
Vanadium	0.487	0.0030	mg/L	0.500	ND	97.4	75-125			
Zinc	0.511	0.0200	mg/L	0.500	ND	102	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike (BJL0477-MS2)</b>										
		<b>Source: 21L0146-13</b>		Prepared: 20-Dec-2021		Analyzed: 23-Dec-2021 14:57				
Iron	2.62	0.200	mg/L	2.00	0.654	98.5	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0477-MSD1)</b>										
		<b>Source: 21L0146-13</b>		Prepared: 20-Dec-2021		Analyzed: 21-Dec-2021 16:34				
Aluminum	2.06	1.00	mg/L	2.00	ND	103	75-125	3.53	20	
Barium	2.26	0.500	mg/L	2.00	ND	94.0	75-125	5.12	20	
Beryllium	0.510	0.0100	mg/L	0.500	ND	102	75-125	4.32	20	
Cadmium	0.512	0.0020	mg/L	0.500	ND	102	75-125	4.82	20	
Calcium	122	0.500	mg/L	10.0	114	78.4	75-125	4.75	20	
Chromium	0.486	0.0100	mg/L	0.500	ND	97.2	75-125	5.75	20	
Cobalt	0.489	0.0100	mg/L	0.500	ND	97.8	75-125	4.62	20	
Copper	0.434	0.0030	mg/L	0.500	ND	86.8	75-125	5.27	20	
Magnesium	75.0	0.500	mg/L	10.0	71.9	31.4	75-125	5.21	20	HC
Manganese	0.674	0.0100	mg/L	0.500	0.206	93.5	75-125	4.32	20	
Nickel	0.490	0.0100	mg/L	0.500	ND	97.9	75-125	4.63	20	
Potassium	13.9	0.500	mg/L	10.0	3.62	102	75-125	4.59	20	
Silver	0.482	0.0050	mg/L	0.500	ND	96.3	75-125	4.70	20	
Sodium	31.2	0.500	mg/L	10.0	21.2	100	75-125	4.40	20	
Vanadium	0.463	0.0030	mg/L	0.500	ND	92.5	75-125	5.12	20	
Zinc	0.485	0.0200	mg/L	0.500	ND	96.9	75-125	5.38	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0477-MSD2)</b>										
		<b>Source: 21L0146-13</b>		Prepared: 20-Dec-2021		Analyzed: 23-Dec-2021 15:02				
Iron	2.65	0.200	mg/L	2.00	0.654	99.6	75-125	0.78	20	



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0477 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0484 - TWM EPA 7470A**

Instrument: HYDRA Analyst: SKD

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0484-BLK1)</b>					Prepared: 20-Dec-2021 Analyzed: 20-Dec-2021 17:04					
Mercury	ND	0.00100	mg/L							U
<b>LCS (BJL0484-BS1)</b>					Prepared: 20-Dec-2021 Analyzed: 20-Dec-2021 17:06					
Mercury	0.00177	0.00100	mg/L	0.00200		88.6	80-120			
<b>Duplicate (BJL0484-DUP1)</b>					Source: 21L0146-13 Prepared: 20-Dec-2021 Analyzed: 20-Dec-2021 17:11					
Mercury	ND	0.00100	mg/L		ND					U
<b>Matrix Spike (BJL0484-MS1)</b>					Source: 21L0146-13 Prepared: 20-Dec-2021 Analyzed: 20-Dec-2021 17:13					
Mercury	ND	0.00100	mg/L	0.00100	ND	92.4	75-125			U

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0484-MSD1)</b>					Source: 21L0146-13 Prepared: 20-Dec-2021 Analyzed: 20-Dec-2021 17:20					
Mercury	ND	0.00100	mg/L	0.00100	ND	91.2	75-125			U

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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Project: Landsburg  
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**Reported:**  
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**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 200.8 in Water</b>	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Thallium-205	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 200.8 UCT-KED in Water</b>	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Selenium-78	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 6010D in Water</b>	
Silver	WADOE,NELAP,DoD-ELAP
Aluminum	WADOE,NELAP,DoD-ELAP
Barium	WADOE,NELAP,DoD-ELAP,ADEC
Beryllium	WADOE,NELAP,DoD-ELAP
Calcium	WADOE,NELAP,DoD-ELAP
Cadmium	WADOE,NELAP,DoD-ELAP,ADEC
Cobalt	WADOE,NELAP,DoD-ELAP
Chromium	WADOE,NELAP,DoD-ELAP,ADEC
Copper	WADOE,NELAP,DoD-ELAP
Iron	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Magnesium	WADOE,NELAP,DoD-ELAP
Manganese	WADOE,NELAP,DoD-ELAP
Sodium	DoD-ELAP,WADOE,NELAP
Sodium-1	DoD-ELAP
Nickel	WADOE,NELAP,DoD-ELAP,ADEC
Vanadium	WADOE,NELAP,DoD-ELAP,ADEC
Zinc	WADOE,NELAP,DoD-ELAP
<b>EPA 7470A in Water</b>	
Mercury	WADOE,NELAP,DoD-ELAP
<b>EPA 8260D in Water</b>	
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE





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1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE



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

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29-Dec-2021 13:56

o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

**EPA 8270E-SIM in Water**

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



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**Reported:**  
29-Dec-2021 13:56

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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**Reported:**  
29-Dec-2021 13:56

### Notes and Definitions

- \* Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- HC The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is  $\leq 5$  times the reporting limit and the replicate control limit defaults to  $\pm$  RL instead of 20% RPD
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria ( $< 20\%$  RSD,  $< 20\%$  drift or minimum RRF)
- 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.



**Analytical Resources, LLC**  
Analytical Chemists and Consultants

06 January 2022

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)  
21L0178

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, LLC

Kelly Bottem, Client Services Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



# Chain of Custody Record & Laboratory Analysis Request



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

ARI Assigned Number: 2120178	Turn-around Requested: Standard	Date:
ARI Client Company: Golder	Phone: 425-883-0777	Page: of
Client Contact: Joseph Xi	No. of Coolers:	Cooler Temps: 2.0; 5.5

Client Project Name: Landsburg 2021 Q4 Sampling	Analysis Requested					Notes/Comments
Client Project #: 9231000007.2021	Samplers: T. Doggett	VOCs	Total Priority Metal	TPH-HCID	1,4-Dioxane	Dissolved Metals

Sample ID	Date	Time	Matrix	No. Containers	VOCs	Total Priority Metal	TPH-HCID	1,4-Dioxane	Dissolved Metals			
LMW-6-1221	12/9/21	1100	GW	11	X	X	X		X			
LMW-7-1221	12/9/21	0940	GW	11	X	X	X		X			
LMW-9-1221	12/9/21	1245	GW	11	X	X	X		X			
LMW-11-1221	12/10/21	1230	GW	11	X	X	X		X			
LMW-14-1221	12/10/21	1055	GW	11	X	X	X		X			
LMW-15-1221	12/10/21	1335	GW	11	X	X	X		X			
LMW-20-1221	12/9/21	1605	GW	2				X				
LMW-21-1221	↓	1440	GW	2				X				
LMW-22-1221	↓	1520	GW	2				X				
Trip Blank-1221-2	—		DI	3	X							

Comments/Special Instructions HOLD DISSOLVED METALS AND TPH FOLLOW-UPS	Relinquished by: (Signature) <i>Turner Doggett</i>	Received by: (Signature) <i>D. L...</i>	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: Turner Doggett	Printed Name: Dimitri L...	Printed Name:	Printed Name:
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 12/10/2021 1620	Date & Time: 12/10/21 1600	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:** Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.



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

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

**Reported:**  
06-Jan-2022 11:59

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
LMW-6-1221	21L0178-01	Water	09-Dec-2021 11:00	10-Dec-2021 16:20
LMW-7-1221	21L0178-03	Water	09-Dec-2021 09:40	10-Dec-2021 16:20
LMW-9-1221	21L0178-05	Water	09-Dec-2021 12:45	10-Dec-2021 16:20
LMW-11-1221	21L0178-07	Water	10-Dec-2021 12:30	10-Dec-2021 16:20
LMW-14-1221	21L0178-09	Water	10-Dec-2021 10:55	10-Dec-2021 16:20
LMW-15-1221	21L0178-11	Water	10-Dec-2021 13:35	10-Dec-2021 16:20
LMW-20-1221	21L0178-13	Water	09-Dec-2021 16:05	10-Dec-2021 16:20
LMW-21-1221	21L0178-14	Water	09-Dec-2021 14:40	10-Dec-2021 16:20
LMW-22-1221	21L0178-15	Water	09-Dec-2021 15:20	10-Dec-2021 16:20
TripBlank-1221-2	21L0178-16	Water	09-Dec-2021 09:40	10-Dec-2021 16:20





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Project: Landsburg  
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Project Manager: Gary Zimmerman

**Reported:**  
06-Jan-2022 11:59

## **Work Order Case Narrative**

### **Volatiles - EPA Method SW8260D**

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

Initial and continuing calibrations were within method requirements with the exception of all associated "Q" flagged analytes which are out of control high in the CCAL. All associated samples that contain analyte analyte have been flagged with a "Q" qualifier.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

### **1,4-Dioxane- EPA Method SW8270E**

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

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

### **Total Metals - EPA Method 200.8, 6010D and 7470A**

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

Initial and continuing calibrations were within method requirements.

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

The blank spike (BS/LCS) percent recoveries were within control limits.





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**Reported:**  
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The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits with the exception of analytes flagged on the associated forms.

**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.



WORK ORDER

21L0178

Samples will be discarded 90 days after submission of a final report unless other instructions are received.

Client: Golder Associates

Project Manager: Kelly Bottem

Project: Landsburg

Project Number: Landsburg

Preservation Confirmation

Container ID	Container Type	pH	
21L0178-01 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	Pass (P)
21L0178-01 B	Glass NM, Amber, 500 mL		
21L0178-01 C	Glass NM, Amber, 500 mL		
21L0178-01 D	Glass NM, Amber, 500 mL		
21L0178-01 E	Glass NM, Amber, 500 mL		
21L0178-01 F	VOA Vial, Clear, 40 mL, HCL		
21L0178-01 G	VOA Vial, Clear, 40 mL, HCL		
21L0178-01 H	VOA Vial, Clear, 40 mL, HCL		
21L0178-01 I	VOA Vial, Clear, 40 mL, HCL		
21L0178-01 J	VOA Vial, Clear, 40 mL, HCL		
21L0178-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	P
21L0178-03 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	P
21L0178-03 B	Glass NM, Amber, 500 mL		
21L0178-03 C	Glass NM, Amber, 500 mL		
21L0178-03 D	Glass NM, Amber, 500 mL		
21L0178-03 E	Glass NM, Amber, 500 mL		
21L0178-03 F	VOA Vial, Clear, 40 mL, HCL		
21L0178-03 G	VOA Vial, Clear, 40 mL, HCL		
21L0178-03 H	VOA Vial, Clear, 40 mL, HCL		
21L0178-03 I	VOA Vial, Clear, 40 mL, HCL		
21L0178-03 J	VOA Vial, Clear, 40 mL, HCL		
21L0178-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	P
21L0178-05 A	HDPE NM, 500 mL, 1:1 HNO3	7.2	P
21L0178-05 B	Glass NM, Amber, 500 mL		
21L0178-05 C	Glass NM, Amber, 500 mL		
21L0178-05 D	Glass NM, Amber, 500 mL		
21L0178-05 E	Glass NM, Amber, 500 mL		
21L0178-05 F	VOA Vial, Clear, 40 mL, HCL		
21L0178-05 G	VOA Vial, Clear, 40 mL, HCL		
21L0178-05 H	VOA Vial, Clear, 40 mL, HCL		
21L0178-05 I	VOA Vial, Clear, 40 mL, HCL		
21L0178-05 J	VOA Vial, Clear, 40 mL, HCL		
21L0178-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	7.2	P
21L0178-07 A	HDPE NM, 500 mL, 1:1 HNO3	>7.2	Fail



WORK ORDER

21L0178

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<b>Client: Golder Associates</b>	<b>Project Manager: Kelly Bottem</b>
<b>Project: Landsburg</b>	<b>Project Number: Landsburg</b>

21L0178-07 B	Glass NM, Amber, 500 mL		
21L0178-07 C	Glass NM, Amber, 500 mL		
21L0178-07 D	Glass NM, Amber, 500 mL		
21L0178-07 E	Glass NM, Amber, 500 mL		
21L0178-07 F	VOA Vial, Clear, 40 mL, HCL		
21L0178-07 G	VOA Vial, Clear, 40 mL, HCL		
21L0178-07 H	VOA Vial, Clear, 40 mL, HCL		
21L0178-07 I	VOA Vial, Clear, 40 mL, HCL		
21L0178-07 J	VOA Vial, Clear, 40 mL, HCL		
21L0178-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0178-09 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0178-09 B	Glass NM, Amber, 500 mL		
21L0178-09 C	Glass NM, Amber, 500 mL		
21L0178-09 D	Glass NM, Amber, 500 mL		
21L0178-09 E	Glass NM, Amber, 500 mL		
21L0178-09 F	VOA Vial, Clear, 40 mL, HCL		
21L0178-09 G	VOA Vial, Clear, 40 mL, HCL		
21L0178-09 H	VOA Vial, Clear, 40 mL, HCL		
21L0178-09 I	VOA Vial, Clear, 40 mL, HCL		
21L0178-09 J	VOA Vial, Clear, 40 mL, HCL	bubble	
21L0178-10 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0178-11 A	HDPE NM, 500 mL, 1:1 HNO3	L2	P
21L0178-11 B	Glass NM, Amber, 500 mL		
21L0178-11 C	Glass NM, Amber, 500 mL		
21L0178-11 D	Glass NM, Amber, 500 mL		
21L0178-11 E	Glass NM, Amber, 500 mL		
21L0178-11 F	VOA Vial, Clear, 40 mL, HCL		
21L0178-11 G	VOA Vial, Clear, 40 mL, HCL		
21L0178-11 H	VOA Vial, Clear, 40 mL, HCL		
21L0178-11 I	VOA Vial, Clear, 40 mL, HCL		
21L0178-11 J	VOA Vial, Clear, 40 mL, HCL		
21L0178-12 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	L2	P
21L0178-13 A	Glass NM, Amber, 500 mL		
21L0178-13 B	Glass NM, Amber, 500 mL		
21L0178-14 A	Glass NM, Amber, 500 mL		
21L0178-14 B	Glass NM, Amber, 500 mL		



WORK ORDER

21L0178

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<b>Client: Golder Associates</b>	<b>Project Manager: Kelly Bottem</b>
<b>Project: Landsburg</b>	<b>Project Number: Landsburg</b>

21L0178-15 A	Glass NM, Amber, 500 mL
21L0178-15 B	Glass NM, Amber, 500 mL
21L0178-16 A	VOA Vial, Clear, 40 mL, HCL
21L0178-16 B	VOA Vial, Clear, 40 mL, HCL
21L0178-16 C	VOA Vial, Clear, 40 mL, HCL

*RB*

Preservation Confirmed By \_\_\_\_\_

*12/13/21*

Date \_\_\_\_\_





# Cooler Receipt Form

ARI Client: Golden

Project Name: Landsburg 2021 Q4 Sampling

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

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

Assigned ARI Job No: 21L0178

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 1610 20 5.5

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

Temp Gun ID#: DOO 2565

Cooler Accepted by: DL Date: 12/10/21 Time: 1610

**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 12/6/21

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

Samples Logged by: RD Date: 12/13/21 Time: 1430 Labels checked by: \_\_\_\_\_

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

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

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



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

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

**Reported:**  
06-Jan-2022 11:59

**LMW-6-1221**  
**21L0178-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 11:00

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:32

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-01 H

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	5.00	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	10.3	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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Redmond WA, 98052-3333

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

Reported:  
06-Jan-2022 11:59

LMW-6-1221  
21L0178-01 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2021 11:00

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:32

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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Redmond WA, 98052-3333

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

**Reported:**  
06-Jan-2022 11:59

**LMW-6-1221**  
**21L0178-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 11:00

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:32

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	94.3	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.6	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	98.5	%	





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**LMW-6-1221**  
**21L0178-01 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/09/2021 11:00  
Instrument: FID3 Analyst: TWC Analyzed: 12/14/2021 16:31

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0178-01 B 01  
Preparation Batch: BJL0305 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	87.1	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	91.7	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 06-Jan-2022 11:59
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**LMW-6-1221**  
**21L0178-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/09/2021 11:00  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:40

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-01 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	2	0.00400	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 06-Jan-2022 11:59
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**LMW-6-1221**  
**21L0178-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/09/2021 11:00  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:40

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-01 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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

**Reported:**  
06-Jan-2022 11:59

**LMW-6-1221**  
**21L0178-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/09/2021 11:00

Instrument: ICP2 Analyst: SKD

Analyzed: 12/29/2021 14:58

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0555  
Prepared: 12/22/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0178-01 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	26.6	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	2.34	mg/L	
Magnesium	7439-95-4	1	0.500	13.3	mg/L	
Manganese	7439-96-5	1	0.0100	0.0346	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	0.741	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	7.35	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-6-1221**  
**21L0178-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/09/2021 11:00  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:24

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0178-01 A  
Preparation Batch: B JL0529 Sample Size: 20 mL  
Prepared: 12/21/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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

**Reported:**  
06-Jan-2022 11:59

**LMW-7-1221**  
**21L0178-03 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 09:40

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:57

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-03 I

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	5.00	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	8.96	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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Reported:  
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LMW-7-1221  
21L0178-03 (Water)

Volatile Organic Compounds

Method: EPA 8260D

Sampled: 12/09/2021 09:40

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:57

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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

**Reported:**  
06-Jan-2022 11:59

**LMW-7-1221**  
**21L0178-03 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 09:40

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 17:57

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	102	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.8	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.5	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	98.3	%	





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**LMW-7-1221**  
**21L0178-03 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/09/2021 09:40  
Instrument: FID3 Analyst: TWC Analyzed: 12/14/2021 16:51

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0178-03 B 01  
Preparation Batch: BJL0305 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	90.0	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	95.2	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 06-Jan-2022 11:59
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**LMW-7-1221**  
**21L0178-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/09/2021 09:40  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:15

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-03 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 06-Jan-2022 11:59
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**LMW-7-1221**  
**21L0178-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/09/2021 09:40  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:15

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-03 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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Redmond WA, 98052-3333

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

**Reported:**  
06-Jan-2022 11:59

**LMW-7-1221**  
**21L0178-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/09/2021 09:40

Instrument: ICP2 Analyst: SKD

Analyzed: 12/29/2021 15:06

**Analysis by: Analytical Resources, LLC**

Sample Preparation:

Preparation Method: TWC EPA 3010A

Extract ID: 21L0178-03 A 03

Preparation Batch: BJL0555

Sample Size: 25 mL

Prepared: 12/22/2021

Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	37.8	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	0.548	mg/L	
Magnesium	7439-95-4	1	0.500	18.0	mg/L	
Manganese	7439-96-5	1	0.0100	0.0531	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	2.72	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	50.0	72.6	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-7-1221**  
**21L0178-03 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/09/2021 09:40  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:27

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0178-03 A  
Preparation Batch: BJL0529 Sample Size: 20 mL  
Prepared: 12/21/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 12:45

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 18:22

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-05 H

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	5.00	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	13.0	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 12:45

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 18:22

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 12:45

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 18:22

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	105	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	103	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	





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**LMW-9-1221**  
**21L0178-05 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/09/2021 12:45  
Instrument: FID3 Analyst: TWC Analyzed: 12/14/2021 17:11

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0178-05 B 01  
Preparation Batch: BJL0305 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	99.9	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	105	%	



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/09/2021 12:45  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:20

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-05 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/09/2021 12:45  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:20

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-05 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/09/2021 12:45

Instrument: ICP2 Analyst: SKD

Analyzed: 12/29/2021 15:26

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0555  
Prepared: 12/22/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0178-05 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	82.1	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	1.55	mg/L	
Magnesium	7439-95-4	1	0.500	46.1	mg/L	
Manganese	7439-96-5	1	0.0100	0.193	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	2.50	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	16.2	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-9-1221**  
**21L0178-05 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/09/2021 12:45  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:29

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0178-05 A  
Preparation Batch: BJL0529 Sample Size: 20 mL  
Prepared: 12/21/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-11-1221**  
**21L0178-07 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 12:30

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 18:48

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: B JL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-07 H

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	5.00	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	6.59	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**LMW-11-1221**  
**21L0178-07 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 12:30

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 18:48

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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Project Manager: Gary Zimmerman

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**LMW-11-1221**  
**21L0178-07 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 12:30

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 18:48

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	98.5	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	101	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	98.7	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	100	%	





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**LMW-11-1221**  
**21L0178-07 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/10/2021 12:30  
Instrument: FID3 Analyst: TWC Analyzed: 12/14/2021 17:31

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0178-07 B 01  
Preparation Batch: BJL0305 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	94.7	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	99.2	%	



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**LMW-11-1221**  
**21L0178-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/10/2021 12:30  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:25

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-07 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-11-1221**  
**21L0178-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/10/2021 12:30  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:25

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-07 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	0.00924	mg/L	
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-11-1221**  
**21L0178-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D Sampled: 12/10/2021 12:30  
Instrument: ICP2 Analyst: SKD Analyzed: 12/29/2021 15:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 21L0178-07 A 03  
Preparation Batch: BJL0555 Sample Size: 25 mL  
Prepared: 12/22/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	60.3	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	0.498	mg/L	
Magnesium	7439-95-4	1	0.500	28.0	mg/L	
Manganese	7439-96-5	1	0.0100	0.186	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	2.07	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	25.3	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-11-1221**  
**21L0178-07 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/10/2021 12:30  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:15

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0178-07 A  
Preparation Batch: BJL0529 Sample Size: 20 mL  
Prepared: 12/21/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 10:55

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 19:13

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-09 F

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	5.00	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
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 10:55

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 19:13

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 10:55

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 19:13

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	103	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	96.7	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	100	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	





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**LMW-14-1221**  
**21L0178-09 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/10/2021 10:55  
Instrument: FID3 Analyst: TWC Analyzed: 12/14/2021 17:51

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0178-09 B 01  
Preparation Batch: BJL0305 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	89.2	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	94.5	%	



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/10/2021 10:55  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-09 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/10/2021 10:55  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-09 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/10/2021 10:55

Instrument: ICP2 Analyst: SKD

Analyzed: 12/29/2021 15:33

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0555  
Prepared: 12/22/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0178-09 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	205	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	0.0191	mg/L	
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	14.9	mg/L	
Magnesium	7439-95-4	1	0.500	125	mg/L	
Manganese	7439-96-5	1	0.0100	0.774	mg/L	
Nickel	7440-02-0	1	0.0100	0.0116	mg/L	
Potassium	7440-09-7	1	0.500	4.79	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	31.3	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-14-1221**  
**21L0178-09 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/10/2021 10:55  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:31

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0178-09 A  
Preparation Batch: BJL0529 Sample Size: 20 mL  
Prepared: 12/21/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 13:35

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 19:38

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-11 H

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	5.00	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	8.78	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/10/2021 13:35

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 19:38

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/10/2021 13:35  
Instrument: NT3 Analyst: PKC Analyzed: 12/13/2021 19:38

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	98.2	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	97.7	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	99.0	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.0	%	





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**LMW-15-1221**  
**21L0178-11 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/10/2021 13:35  
Instrument: FID3 Analyst: TWC Analyzed: 12/14/2021 18:11

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0178-11 B 01  
Preparation Batch: BJL0305 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	87.6	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	92.7	%	



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/10/2021 13:35  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-11 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/10/2021 13:35  
Instrument: ICPMS2 Analyst: MCB Analyzed: 12/18/2021 04:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0178-11 A 01  
Preparation Batch: BJL0443 Sample Size: 25 mL  
Prepared: 12/17/2021 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D

Sampled: 12/10/2021 13:35

Instrument: ICP2 Analyst: SKD

Analyzed: 12/29/2021 15:36

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A  
Preparation Batch: BJL0555  
Prepared: 12/22/2021

Sample Size: 25 mL  
Final Volume: 25 mL

Extract ID: 21L0178-11 A 03

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	60.7	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	4.31	mg/L	
Magnesium	7439-95-4	1	0.500	27.5	mg/L	
Manganese	7439-96-5	1	0.0100	0.378	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	2.06	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	12.2	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**LMW-15-1221**  
**21L0178-11 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/10/2021 13:35  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:38

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0178-11 A  
Preparation Batch: BJL0529 Sample Size: 20 mL  
Prepared: 12/21/2021 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U



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**LMW-20-1221**  
**21L0178-13 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/09/2021 16:05  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 19:49

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0178-13 A 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			33.6-120 %	49.9	%	



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**LMW-21-1221**  
**21L0178-14 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/09/2021 14:40  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 20:14

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0178-14 A 01  
Preparation Batch: B JL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>47.2</i>	<i>%</i>	



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**LMW-22-1221**  
**21L0178-15 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/09/2021 15:20  
Instrument: NT6 Analyst: JZ Analyzed: 12/16/2021 20:39

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0178-15 A 01  
Preparation Batch: BJL0278 Sample Size: 500 mL  
Prepared: 12/14/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>47.3</i>	<i>%</i>	





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Project Manager: Gary Zimmerman

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**TripBlank-1221-2**  
**21L0178-16 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 09:40

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 20:03

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0292  
Prepared: 12/13/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0178-16 B

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	5.00	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
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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Project Manager: Gary Zimmerman

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**TripBlank-1221-2**  
**21L0178-16 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/09/2021 09:40

Instrument: NT3 Analyst: PKC

Analyzed: 12/13/2021 20:03

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**TripBlank-1221-2**  
**21L0178-16 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/09/2021 09:40  
Instrument: NT3 Analyst: PKC Analyzed: 12/13/2021 20:03

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	101	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.2	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	100	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	99.7	%	



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Project Manager: Gary Zimmerman

**Reported:**  
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**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0292-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 12:28								
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	5.00	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
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	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	0.20	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	1.00	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
trans-1,3-Dichloropropene	ND	0.20	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:**  
06-Jan-2022 11:59

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0292-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 12:28								
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	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.25	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	0.50	ug/L							U
Naphthalene	ND	0.50	ug/L							U



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Reported:  
06-Jan-2022 11:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJL0292 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0292-BLK1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 12:28								
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.82		ug/L	5.00		96.4	80-129			
<i>Surrogate: Toluene-d8</i>	4.82		ug/L	5.00		96.3	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.95		ug/L	5.00		99.0	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	5.00		ug/L	5.00		99.9	80-120			
<b>LCS (BJL0292-BS1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:12								
Chloromethane	9.64	0.50	ug/L	10.0		96.4	60-138			
Vinyl Chloride	8.86	0.10	ug/L	10.0		88.6	66-133			
Bromomethane	9.19	1.00	ug/L	10.0		91.9	72-131			
Chloroethane	10.2	0.20	ug/L	10.0		102	60-155			
Trichlorofluoromethane	12.5	0.20	ug/L	10.0		125	62-141			Q
Acrolein	53.8	5.00	ug/L	50.0		108	52-190			
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.36	0.20	ug/L	10.0		93.6	76-129			
Acetone	51.6	5.00	ug/L	50.0		103	58-142			
1,1-Dichloroethene	9.40	0.20	ug/L	10.0		94.0	69-135			
Iodomethane	9.56	1.00	ug/L	10.0		95.6	56-147			
Methylene Chloride	9.63	1.00	ug/L	10.0		96.3	65-135			
Acrylonitrile	9.84	1.00	ug/L	10.0		98.4	64-134			
Carbon Disulfide	9.27	0.20	ug/L	10.0		92.7	78-125			
trans-1,2-Dichloroethene	9.67	0.20	ug/L	10.0		96.7	78-128			
Vinyl Acetate	10.1	0.20	ug/L	10.0		101	55-138			
1,1-Dichloroethane	9.52	0.20	ug/L	10.0		95.2	76-124			
2-Butanone	53.0	5.00	ug/L	50.0		106	61-140			
2,2-Dichloropropane	11.0	0.20	ug/L	10.0		110	66-147			
cis-1,2-Dichloroethene	9.27	0.20	ug/L	10.0		92.7	80-121			
Chloroform	9.53	0.20	ug/L	10.0		95.3	80-122			
Bromochloromethane	9.81	0.20	ug/L	10.0		98.1	80-121			
1,1,1-Trichloroethane	9.46	0.20	ug/L	10.0		94.6	79-123			
1,1-Dichloropropene	9.59	0.10	ug/L	10.0		95.9	80-127			
Carbon tetrachloride	9.99	0.20	ug/L	10.0		99.9	53-137			
1,2-Dichloroethane	9.80	0.20	ug/L	10.0		98.0	75-123			
Benzene	9.88	0.20	ug/L	10.0		98.8	80-120			
Trichloroethene	9.83	0.20	ug/L	10.0		98.3	80-120			



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Project Manager: Gary Zimmerman

Reported:  
06-Jan-2022 11:59

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJL0292 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0292-BS1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:12								
1,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	80-120			
Bromodichloromethane	9.63	0.20	ug/L	10.0		96.3	80-121			
Dibromomethane	10.1	0.20	ug/L	10.0		101	80-120			
2-Chloroethyl vinyl ether	10.4	1.00	ug/L	10.0		104	64-120			
4-Methyl-2-Pentanone	53.6	2.50	ug/L	50.0		107	67-133			
cis-1,3-Dichloropropene	9.73	0.20	ug/L	10.0		97.3	80-124			
Toluene	9.90	0.20	ug/L	10.0		99.0	80-120			
trans-1,3-Dichloropropene	10.0	0.20	ug/L	10.0		100	71-127			
2-Hexanone	53.5	5.00	ug/L	50.0		107	69-133			
1,1,2-Trichloroethane	9.59	0.20	ug/L	10.0		95.9	80-121			
1,3-Dichloropropane	9.64	0.10	ug/L	10.0		96.4	80-120			
Tetrachloroethene	9.44	0.20	ug/L	10.0		94.4	80-120			
Dibromochloromethane	9.98	0.20	ug/L	10.0		99.8	65-135			
1,2-Dibromoethane	10.2	0.10	ug/L	10.0		102	80-121			
Chlorobenzene	9.78	0.20	ug/L	10.0		97.8	80-120			
Ethylbenzene	9.74	0.20	ug/L	10.0		97.4	80-120			
1,1,1,2-Tetrachloroethane	9.56	0.20	ug/L	10.0		95.6	80-120			
m,p-Xylene	20.2	0.40	ug/L	20.0		101	80-121			
o-Xylene	9.87	0.20	ug/L	10.0		98.7	80-121			
Xylenes, total	30.0	0.60	ug/L	30.0		100	76-127			
Styrene	9.83	0.20	ug/L	10.0		98.3	80-124			
Bromoform	9.42	0.20	ug/L	10.0		94.2	51-134			
1,1,2,2-Tetrachloroethane	9.32	0.20	ug/L	10.0		93.2	77-123			
1,2,3-Trichloropropane	9.47	0.25	ug/L	10.0		94.7	76-125			
trans-1,4-Dichloro 2-Butene	10.0	1.00	ug/L	10.0		100	55-129			
n-Propylbenzene	9.82	0.20	ug/L	10.0		98.2	78-130			
Bromobenzene	9.55	0.20	ug/L	10.0		95.5	80-120			
Isopropyl Benzene	9.62	0.20	ug/L	10.0		96.2	80-128			
2-Chlorotoluene	9.38	0.10	ug/L	10.0		93.8	78-122			
4-Chlorotoluene	9.35	0.20	ug/L	10.0		93.5	80-121			
t-Butylbenzene	9.68	0.20	ug/L	10.0		96.8	78-125			
1,3,5-Trimethylbenzene	9.52	0.20	ug/L	10.0		95.2	80-129			
1,2,4-Trimethylbenzene	9.54	0.20	ug/L	10.0		95.4	80-127			
s-Butylbenzene	9.83	0.20	ug/L	10.0		98.3	78-129			
4-Isopropyl Toluene	9.83	0.20	ug/L	10.0		98.3	79-130			



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Project: Landsburg  
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**Reported:**  
06-Jan-2022 11:59

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0292-BS1)</b>										
					Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:12					
1,3-Dichlorobenzene	9.54	0.20	ug/L	10.0		95.4	80-120			
1,4-Dichlorobenzene	9.60	0.20	ug/L	10.0		96.0	80-120			
n-Butylbenzene	9.87	0.20	ug/L	10.0		98.7	74-129			
1,2-Dichlorobenzene	9.69	0.20	ug/L	10.0		96.9	80-120			
1,2-Dibromo-3-chloropropane	10.2	0.50	ug/L	10.0		102	62-123			
1,2,4-Trichlorobenzene	10.2	0.50	ug/L	10.0		102	64-124			
Hexachloro-1,3-Butadiene	9.96	0.50	ug/L	10.0		99.6	58-123			
Naphthalene	10.9	0.50	ug/L	10.0		109	50-134			
1,2,3-Trichlorobenzene	10.4	0.50	ug/L	10.0		104	49-133			
Dichlorodifluoromethane	11.7	0.20	ug/L	10.0		117	48-147			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.90		ug/L	5.00		98.1	80-129			
<i>Surrogate: Toluene-d8</i>	4.94		ug/L	5.00		98.8	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.19		ug/L	5.00		104	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.99		ug/L	5.00		99.8	80-120			
<b>LCS Dup (BJL0292-BSD1)</b>										
					Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:38					
Chloromethane	9.02	0.50	ug/L	10.0		90.2	60-138	6.65	30	
Vinyl Chloride	8.81	0.10	ug/L	10.0		88.1	66-133	0.57	30	
Bromomethane	9.33	1.00	ug/L	10.0		93.3	72-131	1.52	30	
Chloroethane	9.86	0.20	ug/L	10.0		98.6	60-155	3.28	30	
Trichlorofluoromethane	10.6	0.20	ug/L	10.0		106	62-141	16.50	30	Q
Acrolein	48.5	5.00	ug/L	50.0		97.0	52-190	10.40	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.22	0.20	ug/L	10.0		92.2	76-129	1.49	30	
Acetone	47.1	5.00	ug/L	50.0		94.2	58-142	9.01	30	
1,1-Dichloroethene	9.10	0.20	ug/L	10.0		91.0	69-135	3.23	30	
Iodomethane	9.58	1.00	ug/L	10.0		95.8	56-147	0.17	30	
Methylene Chloride	9.79	1.00	ug/L	10.0		97.9	65-135	1.63	30	
Acrylonitrile	9.44	1.00	ug/L	10.0		94.4	64-134	4.22	30	
Carbon Disulfide	9.18	0.20	ug/L	10.0		91.8	78-125	1.04	30	
trans-1,2-Dichloroethene	9.58	0.20	ug/L	10.0		95.8	78-128	0.89	30	
Vinyl Acetate	9.59	0.20	ug/L	10.0		95.9	55-138	5.09	30	
1,1-Dichloroethane	9.57	0.20	ug/L	10.0		95.7	76-124	0.54	30	
2-Butanone	47.9	5.00	ug/L	50.0		95.8	61-140	10.10	30	
2,2-Dichloropropane	10.9	0.20	ug/L	10.0		109	66-147	0.60	30	
cis-1,2-Dichloroethene	9.17	0.20	ug/L	10.0		91.7	80-121	1.15	30	





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**Reported:**  
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**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch B JL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (B JL0292-BSD1)</b>		Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:38								
Chloroform	9.29	0.20	ug/L	10.0		92.9	80-122	2.53	30	
Bromochloromethane	9.44	0.20	ug/L	10.0		94.4	80-121	3.81	30	
1,1,1-Trichloroethane	9.45	0.20	ug/L	10.0		94.5	79-123	0.10	30	
1,1-Dichloropropene	9.22	0.10	ug/L	10.0		92.2	80-127	3.85	30	
Carbon tetrachloride	9.49	0.20	ug/L	10.0		94.9	53-137	5.04	30	
1,2-Dichloroethane	9.18	0.20	ug/L	10.0		91.8	75-123	6.57	30	
Benzene	9.26	0.20	ug/L	10.0		92.6	80-120	6.54	30	
Trichloroethene	9.38	0.20	ug/L	10.0		93.8	80-120	4.69	30	
1,2-Dichloropropane	9.58	0.20	ug/L	10.0		95.8	80-120	5.68	30	
Bromodichloromethane	9.14	0.20	ug/L	10.0		91.4	80-121	5.16	30	
Dibromomethane	9.45	0.20	ug/L	10.0		94.5	80-120	6.40	30	
2-Chloroethyl vinyl ether	9.78	1.00	ug/L	10.0		97.8	64-120	6.47	30	
4-Methyl-2-Pentanone	48.3	2.50	ug/L	50.0		96.6	67-133	10.40	30	
cis-1,3-Dichloropropene	9.20	0.20	ug/L	10.0		92.0	80-124	5.62	30	
Toluene	9.31	0.20	ug/L	10.0		93.1	80-120	6.16	30	
trans-1,3-Dichloropropene	9.34	0.20	ug/L	10.0		93.4	71-127	7.11	30	
2-Hexanone	48.1	5.00	ug/L	50.0		96.2	69-133	10.60	30	
1,1,2-Trichloroethane	8.88	0.20	ug/L	10.0		88.8	80-121	7.74	30	
1,3-Dichloropropane	9.10	0.10	ug/L	10.0		91.0	80-120	5.73	30	
Tetrachloroethene	9.21	0.20	ug/L	10.0		92.1	80-120	2.55	30	
Dibromochloromethane	9.43	0.20	ug/L	10.0		94.3	65-135	5.73	30	
1,2-Dibromoethane	9.33	0.10	ug/L	10.0		93.3	80-121	8.59	30	
Chlorobenzene	9.46	0.20	ug/L	10.0		94.6	80-120	3.40	30	
Ethylbenzene	9.21	0.20	ug/L	10.0		92.1	80-120	5.53	30	
1,1,1,2-Tetrachloroethane	9.15	0.20	ug/L	10.0		91.5	80-120	4.34	30	
m,p-Xylene	18.6	0.40	ug/L	20.0		92.9	80-121	8.16	30	
o-Xylene	9.23	0.20	ug/L	10.0		92.3	80-121	6.71	30	
Xylenes, total	27.8	0.60	ug/L	30.0		92.7	76-127	7.68	30	
Styrene	9.51	0.20	ug/L	10.0		95.1	80-124	3.26	30	
Bromoform	8.89	0.20	ug/L	10.0		88.9	51-134	5.75	30	
1,1,2,2-Tetrachloroethane	8.44	0.20	ug/L	10.0		84.4	77-123	9.92	30	
1,2,3-Trichloropropane	8.40	0.25	ug/L	10.0		84.0	76-125	12.00	30	
trans-1,4-Dichloro 2-Butene	9.18	1.00	ug/L	10.0		91.8	55-129	8.60	30	
n-Propylbenzene	9.45	0.20	ug/L	10.0		94.5	78-130	3.80	30	
Bromobenzene	9.14	0.20	ug/L	10.0		91.4	80-120	4.37	30	



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**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0292 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BJL0292-BSD1)</b>				Prepared: 13-Dec-2021 Analyzed: 13-Dec-2021 11:38						
Isopropyl Benzene	9.30	0.20	ug/L	10.0		93.0	80-128	3.39	30	
2-Chlorotoluene	8.85	0.10	ug/L	10.0		88.5	78-122	5.78	30	
4-Chlorotoluene	8.80	0.20	ug/L	10.0		88.0	80-121	6.07	30	
t-Butylbenzene	9.28	0.20	ug/L	10.0		92.8	78-125	4.25	30	
1,3,5-Trimethylbenzene	9.06	0.20	ug/L	10.0		90.6	80-129	4.94	30	
1,2,4-Trimethylbenzene	9.25	0.20	ug/L	10.0		92.5	80-127	3.08	30	
s-Butylbenzene	9.41	0.20	ug/L	10.0		94.1	78-129	4.37	30	
4-Isopropyl Toluene	9.47	0.20	ug/L	10.0		94.7	79-130	3.71	30	
1,3-Dichlorobenzene	9.13	0.20	ug/L	10.0		91.3	80-120	4.46	30	
1,4-Dichlorobenzene	9.04	0.20	ug/L	10.0		90.4	80-120	5.92	30	
n-Butylbenzene	9.50	0.20	ug/L	10.0		95.0	74-129	3.87	30	
1,2-Dichlorobenzene	9.09	0.20	ug/L	10.0		90.9	80-120	6.37	30	
1,2-Dibromo-3-chloropropane	9.25	0.50	ug/L	10.0		92.5	62-123	9.35	30	
1,2,4-Trichlorobenzene	9.69	0.50	ug/L	10.0		96.9	64-124	5.14	30	
Hexachloro-1,3-Butadiene	9.67	0.50	ug/L	10.0		96.7	58-123	3.00	30	
Naphthalene	9.73	0.50	ug/L	10.0		97.3	50-134	11.70	30	
1,2,3-Trichlorobenzene	9.58	0.50	ug/L	10.0		95.8	49-133	8.42	30	
Dichlorodifluoromethane	11.7	0.20	ug/L	10.0		117	48-147	0.05	30	
Surrogate: 1,2-Dichloroethane-d4	5.19		ug/L	5.00		104	80-129			
Surrogate: Toluene-d8	5.03		ug/L	5.00		101	80-120			
Surrogate: 4-Bromofluorobenzene	5.01		ug/L	5.00		100	80-120			
Surrogate: 1,2-Dichlorobenzene-d4	4.87		ug/L	5.00		97.4	80-120			



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**Analysis by: Analytical Resources, LLC**

**Semivolatile Organic Compounds - SIM - Quality Control**

**Batch BJL0278 - EPA 3520C (Liq Liq)**

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0278-BLK1)</b>				Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 14:51						
1,4-Dioxane	ND	0.4	ug/L							U
<i>Surrogate: 1,4-Dioxane-d8</i>	2.53		ug/L	5.00		50.7	33.6-120			
<b>LCS (BJL0278-BS1)</b>				Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 15:16						
1,4-Dioxane	3.7	0.4	ug/L	10.0		37.0	39.9-120			*
<i>Surrogate: 1,4-Dioxane-d8</i>	2.53		ug/L	5.00		50.6	33.6-120			
<b>LCS Dup (BJL0278-BSD1)</b>				Prepared: 14-Dec-2021 Analyzed: 16-Dec-2021 15:41						
1,4-Dioxane	4.3	0.4	ug/L	10.0		42.6	39.9-120	14.20	30	
<i>Surrogate: 1,4-Dioxane-d8</i>	2.75		ug/L	5.00		55.0	33.6-120			



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Analysis by: Analytical Resources, LLC

**Petroleum Hydrocarbons - Quality Control**

**Batch BJL0305 - EPA 3510C SepF**

Instrument: FID3 Analyst: TWC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0305-BLK1)</b>		Prepared: 14-Dec-2021 Analyzed: 14-Dec-2021 15:31								
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: <i>o</i> -Terphenyl	0.205		mg/L	0.225	90.9		50-150			
Surrogate: <i>n</i> -Triacontane	0.213		mg/L	0.225	94.7		50-150			



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0443 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0443-BLK1)</b>			Prepared: 17-Dec-2021 Analyzed: 18-Dec-2021 00:45								
Antimony	121	ND	0.00300	mg/L							U
Antimony	123	ND	0.00300	mg/L							U
Lead	208	ND	0.0100	mg/L							U
Arsenic	75a	ND	0.00300	mg/L							U
Selenium	78	ND	0.0250	mg/L							U
<b>Blank (BJL0443-BLK2)</b>			Prepared: 17-Dec-2021 Analyzed: 21-Dec-2021 23:10								
Thallium	205	ND	0.00200	mg/L							U
<b>LCS (BJL0443-BS1)</b>			Prepared: 17-Dec-2021 Analyzed: 18-Dec-2021 00:51								
Antimony	121	0.0247	0.00300	mg/L	0.0250		98.7	80-120			
Antimony	123	0.0243	0.00300	mg/L	0.0250		97.3	80-120			
Lead	208	0.0252	0.0100	mg/L	0.0250		101	80-120			
Arsenic	75a	0.0243	0.00300	mg/L	0.0250		97.1	80-120			
Selenium	78	0.0788	0.0250	mg/L	0.0800		98.5	80-120			
<b>LCS (BJL0443-BS2)</b>			Prepared: 17-Dec-2021 Analyzed: 21-Dec-2021 23:15								
Thallium	205	0.0247	0.00200	mg/L	0.0250		98.7	80-120			
<b>Duplicate (BJL0443-DUP1)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021 Analyzed: 18-Dec-2021 04:45					
Antimony	121	ND	0.00300	mg/L		ND					U
Lead	208	ND	0.0100	mg/L		ND					U
Arsenic	75a	ND	0.00300	mg/L		ND					U
Selenium	78	ND	0.0250	mg/L		ND					U
<b>Duplicate (BJL0443-DUP2)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021 Analyzed: 22-Dec-2021 21:25					
Thallium	205	ND	0.00400	mg/L		ND					U
<b>Matrix Spike (BJL0443-MS1)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021 Analyzed: 18-Dec-2021 04:51					
Antimony	121	0.0243	0.00300	mg/L	0.0250	ND	97.3	75-125			
Lead	208	0.0292	0.0100	mg/L	0.0250	ND	116	75-125			
Arsenic	75a	0.0241	0.00300	mg/L	0.0250	ND	96.2	75-125			
Selenium	78	0.0726	0.0250	mg/L	0.0800	ND	90.7	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
<b>Matrix Spike (BJL0443-MS2)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021 Analyzed: 22-Dec-2021 21:30					



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0443 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BJL0443-MS2)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021		Analyzed: 22-Dec-2021 21:30			
Thallium	205	0.0253	0.00400	mg/L	0.0250	ND	101	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0443-MSD1)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021		Analyzed: 18-Dec-2021 04:57			
Antimony	121	0.0235	0.00300	mg/L	0.0250	ND	93.8	75-125	3.61	20	
Lead	208	0.0279	0.0100	mg/L	0.0250	ND	111	75-125	4.35	20	
Arsenic	75a	0.0244	0.00300	mg/L	0.0250	ND	97.5	75-125	1.40	20	
Selenium	78	0.0753	0.0250	mg/L	0.0800	ND	94.1	75-125	3.62	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0443-MSD2)</b>			<b>Source: 21L0178-01</b>			Prepared: 17-Dec-2021		Analyzed: 22-Dec-2021 21:34			
Thallium	205	0.0252	0.00400	mg/L	0.0250	ND	101	75-125	0.49	20	D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0529 - TWM EPA 7470A**

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0529-BLK1)</b>					Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 12:11					
Mercury	ND	0.00100	mg/L							U
<b>LCS (BJL0529-BS1)</b>					Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 12:13					
Mercury	0.00183	0.00100	mg/L	0.00200		91.3	80-120			
<b>Duplicate (BJL0529-DUP1)</b>					Source: 21L0178-07 Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 12:18					
Mercury	ND	0.00100	mg/L		ND					U
<b>Matrix Spike (BJL0529-MS1)</b>					Source: 21L0178-07 Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 12:20					
Mercury	ND	0.00100	mg/L	0.00100	ND	87.3	75-125			U
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
<b>Matrix Spike Dup (BJL0529-MSD1)</b>					Source: 21L0178-07 Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 12:22					
Mercury	ND	0.00100	mg/L	0.00100	ND	88.0	75-125			U
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0555 - TWC EPA 3010A**

Instrument: ICP2 Analyst: SKD

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0555-BLK1)</b>										
					Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 14:40					
Aluminum	ND	1.00	mg/L							U
Beryllium	ND	0.0100	mg/L							U
Cadmium	ND	0.0020	mg/L							U
Calcium	ND	0.500	mg/L							U
Chromium	ND	0.0100	mg/L							U
Cobalt	ND	0.0100	mg/L							U
Copper	ND	0.0030	mg/L							U
Iron	ND	0.200	mg/L							U
Magnesium	ND	0.500	mg/L							U
Manganese	ND	0.0100	mg/L							U
Nickel	ND	0.0100	mg/L							U
Potassium	ND	0.500	mg/L							U
Silver	ND	0.0050	mg/L							U
Sodium	ND	0.500	mg/L							U
Vanadium	ND	0.0030	mg/L							U
Zinc	ND	0.0200	mg/L							U

<b>Blank (BJL0555-BLK2)</b>										
					Prepared: 22-Dec-2021 Analyzed: 04-Jan-2022 14:41					
Barium	ND	0.500	mg/L							U

<b>LCS (BJL0555-BS1)</b>										
					Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 14:42					
Aluminum	2.06	1.00	mg/L	2.00		103	80-120			
Beryllium	0.525	0.0100	mg/L	0.500		105	80-120			
Cadmium	0.551	0.0020	mg/L	0.500		110	80-120			
Calcium	9.56	0.500	mg/L	10.0		95.6	80-120			
Chromium	0.505	0.0100	mg/L	0.500		101	80-120			
Cobalt	0.541	0.0100	mg/L	0.500		108	80-120			
Copper	0.467	0.0030	mg/L	0.500		93.4	80-120			
Iron	1.94	0.200	mg/L	2.00		97.0	80-120			
Magnesium	10.5	0.500	mg/L	10.0		105	80-120			
Manganese	0.505	0.0100	mg/L	0.500		101	80-120			
Nickel	0.502	0.0100	mg/L	0.500		100	80-120			
Potassium	10.0	0.500	mg/L	10.0		100	80-120			
Silver	0.498	0.0050	mg/L	0.500		99.7	80-120			
Sodium	10.5	0.500	mg/L	10.0		105	80-120			





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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0555 - TWC EPA 3010A**

Instrument: ICP2 Analyst: SKD

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0555-BS1)</b>					Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 14:42					
Vanadium	0.486	0.0030	mg/L	0.500		97.3	80-120			
Zinc	0.498	0.0200	mg/L	0.500		99.6	80-120			
<b>LCS (BJL0555-BS2)</b>					Prepared: 22-Dec-2021 Analyzed: 04-Jan-2022 14:44					
Barium	2.00	0.500	mg/L	2.00		99.9	80-120			
<b>Duplicate (BJL0555-DUP1)</b>					Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 15:01					
Aluminum	ND	1.00	mg/L		ND					U
Beryllium	ND	0.0100	mg/L		ND					U
Cadmium	ND	0.0020	mg/L		ND					U
Calcium	37.2	0.500	mg/L		37.8			1.55	20	
Chromium	ND	0.0100	mg/L		ND					U
Cobalt	ND	0.0100	mg/L		ND					U
Copper	ND	0.0030	mg/L		ND					U
Iron	0.535	0.200	mg/L		0.548			2.23	20	
Magnesium	17.7	0.500	mg/L		18.0			1.80	20	
Manganese	0.0524	0.0100	mg/L		0.0531			1.25	20	
Nickel	ND	0.0100	mg/L		ND					U
Potassium	2.70	0.500	mg/L		2.72			0.77	20	
Silver	ND	0.0050	mg/L		ND					U
Vanadium	ND	0.0030	mg/L		ND					U
Zinc	ND	0.0200	mg/L		ND					U
<b>Duplicate (BJL0555-DUP2)</b>					Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 04-Jan-2022 14:48					
Barium	ND	0.500	mg/L		ND					U
Sodium	71.1	50.0	mg/L		72.6			1.98	20	
<b>Matrix Spike (BJL0555-MS1)</b>					Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 15:09					
Aluminum	2.14	1.00	mg/L	2.00	ND	107	75-125			
Beryllium	0.536	0.0100	mg/L	0.500	ND	107	75-125			
Cadmium	0.561	0.0020	mg/L	0.500	ND	112	75-125			
Calcium	47.2	0.500	mg/L	10.0	37.8	94.7	75-125			
Chromium	0.527	0.0100	mg/L	0.500	ND	105	75-125			
Cobalt	0.535	0.0100	mg/L	0.500	ND	107	75-125			
Copper	0.472	0.0030	mg/L	0.500	ND	94.3	75-125			
Iron	2.53	0.200	mg/L	2.00	0.548	99.0	75-125			



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0555 - TWC EPA 3010A**

Instrument: ICP2 Analyst: SKD

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BJL0555-MS1)</b> Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 15:09										
Magnesium	30.7	0.500	mg/L	10.0	18.0	127	75-125			*
Manganese	0.578	0.0100	mg/L	0.500	0.0531	105	75-125			
Nickel	0.519	0.0100	mg/L	0.500	ND	104	75-125			
Potassium	13.0	0.500	mg/L	10.0	2.72	103	75-125			
Silver	0.508	0.0050	mg/L	0.500	ND	101	75-125			
Vanadium	0.498	0.0030	mg/L	0.500	ND	99.6	75-125			
Zinc	0.514	0.0200	mg/L	0.500	ND	103	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike (BJL0555-MS2)</b> Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 04-Jan-2022 14:54										
Barium	2.48	0.500	mg/L	2.00	ND	104	75-125			
Sodium	73.6	50.0	mg/L	10.0	72.6	10.8	75-125			HC

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0555-MSD1)</b> Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 29-Dec-2021 15:21										
Aluminum	2.16	1.00	mg/L	2.00	ND	108	75-125	0.58	20	
Beryllium	0.538	0.0100	mg/L	0.500	ND	108	75-125	0.28	20	
Cadmium	0.570	0.0020	mg/L	0.500	ND	114	75-125	1.46	20	
Calcium	48.9	0.500	mg/L	10.0	37.8	112	75-125	3.56	20	
Chromium	0.534	0.0100	mg/L	0.500	ND	107	75-125	1.34	20	
Cobalt	0.543	0.0100	mg/L	0.500	ND	109	75-125	1.38	20	
Copper	0.467	0.0030	mg/L	0.500	ND	93.3	75-125	1.09	20	
Iron	2.55	0.200	mg/L	2.00	0.548	100	75-125	1.09	20	
Magnesium	31.9	0.500	mg/L	10.0	18.0	139	75-125	3.93	20	*
Manganese	0.583	0.0100	mg/L	0.500	0.0531	106	75-125	0.77	20	
Nickel	0.529	0.0100	mg/L	0.500	ND	106	75-125	1.95	20	
Potassium	13.0	0.500	mg/L	10.0	2.72	103	75-125	0.24	20	
Silver	0.505	0.0050	mg/L	0.500	ND	101	75-125	0.45	20	
Vanadium	0.499	0.0030	mg/L	0.500	ND	99.8	75-125	0.22	20	
Zinc	0.524	0.0200	mg/L	0.500	ND	105	75-125	1.82	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BJL0555-MSD2)</b> Source: 21L0178-03 Prepared: 22-Dec-2021 Analyzed: 04-Jan-2022 14:59										
Barium	2.51	0.500	mg/L	2.00	ND	105	75-125	1.12	20	
Sodium	76.6	50.0	mg/L	10.0	72.6	40.2	75-125	3.91	20	HC



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BJL0555 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 200.8 in Water</b>	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Thallium-205	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 200.8 UCT-KED in Water</b>	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Selenium-78	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 6010D in Water</b>	
Silver	WADOE,NELAP,DoD-ELAP
Aluminum	WADOE,NELAP,DoD-ELAP
Barium	WADOE,NELAP,DoD-ELAP,ADEC
Beryllium	WADOE,NELAP,DoD-ELAP
Calcium	WADOE,NELAP,DoD-ELAP
Cadmium	WADOE,NELAP,DoD-ELAP,ADEC
Cobalt	WADOE,NELAP,DoD-ELAP
Chromium	WADOE,NELAP,DoD-ELAP,ADEC
Copper	WADOE,NELAP,DoD-ELAP
Iron	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Magnesium	WADOE,NELAP,DoD-ELAP
Manganese	WADOE,NELAP,DoD-ELAP
Sodium	DoD-ELAP,WADOE,NELAP
Sodium-1	DoD-ELAP
Nickel	WADOE,NELAP,DoD-ELAP,ADEC
Vanadium	WADOE,NELAP,DoD-ELAP,ADEC
Zinc	WADOE,NELAP,DoD-ELAP
<b>EPA 7470A in Water</b>	
Mercury	WADOE,NELAP,DoD-ELAP
<b>EPA 8260D in Water</b>	
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE



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1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE



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Project Manager: Gary Zimmerman

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o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

**EPA 8270E-SIM in Water**

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



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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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### Notes and Definitions

- \* Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- HC The natural concentration of the spiked analyte is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
- J Estimated concentration value detected below the reporting limit.
- Q Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
- 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.





**Analytical Resources, LLC**  
Analytical Chemists and Consultants

17 February 2022

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

RE: Landsburg (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)  
21L0271

Associated SDG ID(s)  
N/A

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

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

Analytical Resources, LLC

Kelly Bottem, Client Services Manager

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



# Chain of Custody Record & Laboratory Analysis Request



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

ARI Assigned Number: <b>21L0271</b>	Turn-around Requested: <b>Standard</b>	Date: <b>12/17/21</b>
ARI Client Company: <b>Golder</b>	Phone: <b>425-883-0777</b>	Page: <b>1</b> of <b>1</b>
Client Contact: <b>Joseph Xi</b>	No. of Coolers: <b>1</b>	Cooler Temps: <b>5.2</b>

Client Project Name: <b>Landsburg 2021 Q4 Sampling</b>					Analysis Requested							Notes/Comments
Sample ID	Date	Time	Matrix	No. Containers	VOCs	Total Priority Metal	TPH-HCID	1,4-Dioxane				
<b>Landsburg Estates -1221</b>	<b>12/17/21</b>	<b>0915</b>	<b>W</b>	<b>12</b>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				Analyze in accordance with MSA between Golder and ARI Ecology EIM EDD
<b>Trip Blank</b>				<b>3</b>	<input checked="" type="checkbox"/>							
Comments/Special Instructions <b>HOLD DISSOLVED METALS AND TPH FOLLOW-UPS</b>					Relinquished by: (Signature)	Received by: (Signature)			Relinquished by: (Signature)			Received by: (Signature)
					Printed Name: <b>Joseph Xi</b>	Printed Name: <b>Raven Barbera</b>			Printed Name:			Printed Name:
					Company: <b>Golder</b>	Company: <b>ARI</b>			Company:			Company:
					Date & Time: <b>12/17/21 1150</b>	Date & Time: <b>12/17/21 1150</b>			Date & Time:			Date & Time:

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

**Sample Retention Policy:** Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Landsburg Estates-1221	21L0271-01	Water	17-Dec-2021 09:15	17-Dec-2021 11:50
Trip Blank	21L0271-02	Water	17-Dec-2021 09:15	17-Dec-2021 11:50



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Project Number: Landsburg  
Project Manager: Gary Zimmerman

**Reported:**  
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## **Work Order Case Narrative**

### **Volatiles - EPA Method SW8260D**

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The blank spike and blank spike duplicate (BS/LCS and BSD/LCSD) spike recoveries and relative percent difference (RPD) were within control limits.

### **1,4-Dioxane- EPA Method SW8270E**

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

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

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

The blank spike (BS/LCS) percent recoveries were outside the control limits and flagged on the associated forms.

### **Total Metals - EPA Method 200.8, 6010D and 7470A**

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

Initial and continuing calibrations were within method requirements.

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

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.



Golder Associates

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Project: Landsburg

Project Number: Landsburg

Project Manager: Gary Zimmerman

**Reported:**

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**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.







# Cooler Receipt Form

ARI Client: Golder  
 COC No(s): \_\_\_\_\_ NA  
 Assigned ARI Job No: 21L0271

Project Name: Landsburg 2021 Q4 Sampling  
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
 Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO  
 Were custody papers included with the cooler? ..... YES NO  
 Were custody papers properly filled out (ink, signed, etc.) ..... YES NO  
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1150 S.2  
 If cooler temperature is out of compliance, fill out form 00070F  
 Temp Gun ID#: DOO2565

Cooler Accepted by: [Signature] Date: 12/17/21 Time: 1150

**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 12/24/21  
 Were the sample(s) split by ARI? NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: [Signature] Date: 12/21/21 Time: 0919 Labels checked by: \_\_\_\_\_

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

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

Additional Notes, Discrepancies, & Resolutions:

By: \_\_\_\_\_ Date: \_\_\_\_\_



Golder Associates  
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Project: Landsburg  
Project Number: Landsburg  
Project Manager: Gary Zimmerman

**Reported:**  
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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/17/2021 09:15

Instrument: NT3 Analyst: PKC

Analyzed: 12/22/2021 12:08

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0554  
Prepared: 12/22/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0271-01 I

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	5.00	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	8.91	ug/L	
1,1-Dichloroethene	75-35-4	1	0.20	ND	ug/L	U
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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





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Project Manager: Gary Zimmerman

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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/17/2021 09:15

Instrument: NT3 Analyst: PKC

Analyzed: 12/22/2021 12:08

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	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	<b>Reported:</b> 17-Feb-2022 16:57
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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/17/2021 09:15  
Instrument: NT3 Analyst: PKC Analyzed: 12/22/2021 12:08

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	94.1	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	99.9	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	97.8	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Semivolatile Organic Compounds - SIM**

Method: EPA 8270E-SIM Sampled: 12/17/2021 09:15  
Instrument: NT6 Analyst: JZ Analyzed: 01/03/2022 16:58

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3520C (Liq Liq) Extract ID: 21L0271-01 E 01  
Preparation Batch: BJL0519 Sample Size: 500 mL  
Prepared: 12/21/2021 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
<i>Surrogate: 1,4-Dioxane-d8</i>			<i>33.6-120 %</i>	<i>45.6</i>	<i>%</i>	



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Petroleum Hydrocarbons**

Method: NWTPH-HCID Sampled: 12/17/2021 09:15  
Instrument: FID4 Analyst: JGR Analyzed: 12/22/2021 07:57

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 21L0271-01 B 01  
Preparation Batch: BJL0518 Sample Size: 500 mL  
Prepared: 12/21/2021 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
<i>Surrogate: o-Terphenyl</i>			50-150 %	100	%	
<i>Surrogate: n-Triacontane</i>			50-150 %	103	%	



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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 Sampled: 12/17/2021 09:15  
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/12/2022 08:53

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0271-01 A 02  
Preparation Batch: BKA0083 Sample Size: 25 mL  
Prepared: 01/05/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Antimony	7440-36-0	1	0.00300	ND	mg/L	U
Lead	7439-92-1	1	0.0100	ND	mg/L	U
Thallium	7440-28-0	1	0.00200	ND	mg/L	U



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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 200.8 UCT-KED Sampled: 12/17/2021 09:15  
Instrument: ICPMS2 Analyst: MCB Analyzed: 01/07/2022 07:45

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix Extract ID: 21L0271-01 A 02  
Preparation Batch: BKA0083 Sample Size: 25 mL  
Prepared: 01/05/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.00300	ND	mg/L	U
Selenium	7782-49-2	1	0.0250	ND	mg/L	U



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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 6010D Sampled: 12/17/2021 09:15  
Instrument: ICP2 Analyst: MVP Analyzed: 01/10/2022 16:58

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWC EPA 3010A Extract ID: 21L0271-01 A 02  
Preparation Batch: BKA0023 Sample Size: 25 mL  
Prepared: 01/03/2022 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Aluminum	7429-90-5	1	1.00	ND	mg/L	U
Barium	7440-39-3	1	0.500	ND	mg/L	U
Beryllium	7440-41-7	1	0.0100	ND	mg/L	U
Cadmium	7440-43-9	1	0.0020	ND	mg/L	U
Calcium	7440-70-2	1	0.500	35.2	mg/L	
Chromium	7440-47-3	1	0.0100	ND	mg/L	U
Cobalt	7440-48-4	1	0.0100	ND	mg/L	U
Copper	7440-50-8	1	0.0030	ND	mg/L	U
Iron	7439-89-6	1	0.200	ND	mg/L	U
Magnesium	7439-95-4	1	0.500	10.7	mg/L	
Manganese	7439-96-5	1	0.0100	0.0125	mg/L	
Nickel	7440-02-0	1	0.0100	ND	mg/L	U
Potassium	7440-09-7	1	0.500	1.08	mg/L	
Silver	7440-22-4	1	0.0050	ND	mg/L	U
Sodium	7440-23-5	1	0.500	8.95	mg/L	
Vanadium	7440-62-2	1	0.0030	ND	mg/L	U
Zinc	7440-66-6	1	0.0200	ND	mg/L	U



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**Landsburg Estates-1221**  
**21L0271-01 (Water)**

**Metals and Metallic Compounds**

Method: EPA 7470A Sampled: 12/17/2021 09:15  
Instrument: HYDRA Analyst: ML Analyzed: 01/03/2022 12:55

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: TWM EPA 7470A Extract ID: 21L0271-01 A  
Preparation Batch: BKA0002 Sample Size: 20 mL  
Prepared: 01/03/2022 Final Volume: 20 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Mercury	7439-97-6	1	0.00100	ND	mg/L	U





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**Trip Blank**  
**21L0271-02 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/17/2021 09:15

Instrument: NT3 Analyst: PKC

Analyzed: 12/22/2021 11:43

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: EPA 5030C (Purge and Trap)  
Preparation Batch: BJL0554  
Prepared: 12/22/2021

Sample Size: 10 mL  
Final Volume: 10 mL

Extract ID: 21L0271-02 B

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	5.00	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
Iodomethane	74-88-4	1	1.00	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	0.20	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	0.20	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	1.00	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



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**Trip Blank**  
**21L0271-02 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D

Sampled: 12/17/2021 09:15

Instrument: NT3 Analyst: PKC

Analyzed: 12/22/2021 11:43

Analysis by: Analytical Resources, LLC

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
trans-1,3-Dichloropropene	10061-02-6	1	0.20	ND	ug/L	U
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	0.20	ND	ug/L	U
1,2,3-Trichloropropane	96-18-4	1	0.25	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	0.50	ND	ug/L	U
Naphthalene	91-20-3	1	0.50	ND	ug/L	U
1,2,3-Trichlorobenzene	87-61-6	1	0.50	ND	ug/L	U



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**Trip Blank**  
**21L0271-02 (Water)**

**Volatile Organic Compounds**

Method: EPA 8260D Sampled: 12/17/2021 09:15  
Instrument: NT3 Analyst: PKC Analyzed: 12/22/2021 11:43

**Analysis by: Analytical Resources, LLC**

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Dichlorodifluoromethane	75-71-8	1	0.20	ND	ug/L	U
<i>Surrogate: 1,2-Dichloroethane-d4</i>			80-129 %	95.3	%	
<i>Surrogate: Toluene-d8</i>			80-120 %	100	%	
<i>Surrogate: 4-Bromofluorobenzene</i>			80-120 %	103	%	
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>			80-120 %	101	%	



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Project Number: Landsburg  
Project Manager: Gary Zimmerman

**Reported:**  
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**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0554 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0554-BLK1)</b>		Prepared: 22-Dec-2021 Analyzed: 22-Dec-2021 11:18								
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	5.00	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
Iodomethane	ND	1.00	ug/L							U
Methylene Chloride	ND	1.00	ug/L							U
Acrylonitrile	ND	1.00	ug/L							U
Carbon Disulfide	ND	0.20	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	0.20	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	1.00	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
trans-1,3-Dichloropropene	ND	0.20	ug/L							U



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**Reported:**  
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**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0554 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0554-BLK1)</b>		Prepared: 22-Dec-2021 Analyzed: 22-Dec-2021 11:18								
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	0.20	ug/L							U
1,2,3-Trichloropropane	ND	0.25	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	0.50	ug/L							U
Naphthalene	ND	0.50	ug/L							U



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Project Manager: Gary Zimmerman

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**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0554 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0554-BLK1)</b>										
					Prepared: 22-Dec-2021		Analyzed: 22-Dec-2021 11:18			
1,2,3-Trichlorobenzene	ND	0.50	ug/L							U
Dichlorodifluoromethane	ND	0.20	ug/L							U
<i>Surrogate: 1,2-Dichloroethane-d4</i>	4.94		ug/L	5.00		98.9	80-129			
<i>Surrogate: Toluene-d8</i>	5.00		ug/L	5.00		99.9	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	4.99		ug/L	5.00		99.9	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.97		ug/L	5.00		99.4	80-120			

<b>LCS (BJL0554-BS1)</b>										
					Prepared: 22-Dec-2021		Analyzed: 22-Dec-2021 10:02			
Chloromethane	8.94	0.50	ug/L	10.0		89.4	60-138			
Vinyl Chloride	9.45	0.10	ug/L	10.0		94.5	66-133			
Bromomethane	9.53	1.00	ug/L	10.0		95.3	72-131			
Chloroethane	9.97	0.20	ug/L	10.0		99.7	60-155			
Trichlorofluoromethane	9.56	0.20	ug/L	10.0		95.6	62-141			
Acrolein	44.8	5.00	ug/L	50.0		89.6	52-190			
1,1,2-Trichloro-1,2,2-Trifluoroethane	9.92	0.20	ug/L	10.0		99.2	76-129			
Acetone	42.7	5.00	ug/L	50.0		85.5	58-142			
1,1-Dichloroethene	9.40	0.20	ug/L	10.0		94.0	69-135			
Iodomethane	9.47	1.00	ug/L	10.0		94.7	56-147			
Methylene Chloride	9.22	1.00	ug/L	10.0		92.2	65-135			
Acrylonitrile	8.86	1.00	ug/L	10.0		88.6	64-134			
Carbon Disulfide	9.97	0.20	ug/L	10.0		99.7	78-125			
trans-1,2-Dichloroethene	9.50	0.20	ug/L	10.0		95.0	78-128			
Vinyl Acetate	9.32	0.20	ug/L	10.0		93.2	55-138			
1,1-Dichloroethane	9.67	0.20	ug/L	10.0		96.7	76-124			
2-Butanone	43.5	5.00	ug/L	50.0		86.9	61-140			
2,2-Dichloropropane	10.2	0.20	ug/L	10.0		102	66-147			
cis-1,2-Dichloroethene	9.68	0.20	ug/L	10.0		96.8	80-121			
Chloroform	9.49	0.20	ug/L	10.0		94.9	80-122			
Bromochloromethane	9.21	0.20	ug/L	10.0		92.1	80-121			
1,1,1-Trichloroethane	9.53	0.20	ug/L	10.0		95.3	79-123			
1,1-Dichloropropene	9.54	0.10	ug/L	10.0		95.4	80-127			
Carbon tetrachloride	9.86	0.20	ug/L	10.0		98.6	53-137			
1,2-Dichloroethane	9.41	0.20	ug/L	10.0		94.1	75-123			
Benzene	9.73	0.20	ug/L	10.0		97.3	80-120			
Trichloroethene	9.58	0.20	ug/L	10.0		95.8	80-120			



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Reported:  
17-Feb-2022 16:57

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJL0554 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0554-BS1)</b>		Prepared: 22-Dec-2021 Analyzed: 22-Dec-2021 10:02								
1,2-Dichloropropane	9.51	0.20	ug/L	10.0		95.1	80-120			
Bromodichloromethane	9.11	0.20	ug/L	10.0		91.1	80-121			
Dibromomethane	8.87	0.20	ug/L	10.0		88.7	80-120			
2-Chloroethyl vinyl ether	9.26	1.00	ug/L	10.0		92.6	64-120			
4-Methyl-2-Pentanone	44.0	2.50	ug/L	50.0		87.9	67-133			
cis-1,3-Dichloropropene	9.69	0.20	ug/L	10.0		96.9	80-124			
Toluene	9.58	0.20	ug/L	10.0		95.8	80-120			
trans-1,3-Dichloropropene	9.31	0.20	ug/L	10.0		93.1	71-127			
2-Hexanone	45.6	5.00	ug/L	50.0		91.1	69-133			
1,1,2-Trichloroethane	8.47	0.20	ug/L	10.0		84.7	80-121			
1,3-Dichloropropane	9.57	0.10	ug/L	10.0		95.7	80-120			
Tetrachloroethene	9.97	0.20	ug/L	10.0		99.7	80-120			
Dibromochloromethane	9.70	0.20	ug/L	10.0		97.0	65-135			
1,2-Dibromoethane	8.94	0.10	ug/L	10.0		89.4	80-121			
Chlorobenzene	9.90	0.20	ug/L	10.0		99.0	80-120			
Ethylbenzene	9.75	0.20	ug/L	10.0		97.5	80-120			
1,1,1,2-Tetrachloroethane	9.94	0.20	ug/L	10.0		99.4	80-120			
m,p-Xylene	20.1	0.40	ug/L	20.0		101	80-121			
o-Xylene	10.0	0.20	ug/L	10.0		100	80-121			
Xylenes, total	30.2	0.60	ug/L	30.0		101	76-127			
Styrene	9.92	0.20	ug/L	10.0		99.2	80-124			
Bromoform	8.98	0.20	ug/L	10.0		89.8	51-134			
1,1,2,2-Tetrachloroethane	9.65	0.20	ug/L	10.0		96.5	77-123			
1,2,3-Trichloropropane	9.05	0.25	ug/L	10.0		90.5	76-125			
trans-1,4-Dichloro 2-Butene	9.12	1.00	ug/L	10.0		91.2	55-129			
n-Propylbenzene	10.3	0.20	ug/L	10.0		103	78-130			
Bromobenzene	9.76	0.20	ug/L	10.0		97.6	80-120			
Isopropyl Benzene	10.1	0.20	ug/L	10.0		101	80-128			
2-Chlorotoluene	9.70	0.10	ug/L	10.0		97.0	78-122			
4-Chlorotoluene	10.0	0.20	ug/L	10.0		100	80-121			
t-Butylbenzene	10.1	0.20	ug/L	10.0		101	78-125			
1,3,5-Trimethylbenzene	10.1	0.20	ug/L	10.0		101	80-129			
1,2,4-Trimethylbenzene	10.1	0.20	ug/L	10.0		101	80-127			
s-Butylbenzene	10.4	0.20	ug/L	10.0		104	78-129			
4-Isopropyl Toluene	10.4	0.20	ug/L	10.0		104	79-130			



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

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

**Reported:**  
17-Feb-2022 16:57

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0554 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BJL0554-BS1)</b>										
					Prepared: 22-Dec-2021		Analyzed: 22-Dec-2021 10:02			
1,3-Dichlorobenzene	9.81	0.20	ug/L	10.0		98.1	80-120			
1,4-Dichlorobenzene	9.74	0.20	ug/L	10.0		97.4	80-120			
n-Butylbenzene	10.2	0.20	ug/L	10.0		102	74-129			
1,2-Dichlorobenzene	9.46	0.20	ug/L	10.0		94.6	80-120			
1,2-Dibromo-3-chloropropane	9.04	0.50	ug/L	10.0		90.4	62-123			
1,2,4-Trichlorobenzene	9.68	0.50	ug/L	10.0		96.8	64-124			
Hexachloro-1,3-Butadiene	10.2	0.50	ug/L	10.0		102	58-123			
Naphthalene	9.48	0.50	ug/L	10.0		94.8	50-134			
1,2,3-Trichlorobenzene	9.43	0.50	ug/L	10.0		94.3	49-133			
Dichlorodifluoromethane	9.51	0.20	ug/L	10.0		95.1	48-147			
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.02		ug/L	5.00		100	80-129			
<i>Surrogate: Toluene-d8</i>	5.03		ug/L	5.00		101	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.04		ug/L	5.00		101	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.86		ug/L	5.00		97.1	80-120			
<b>LCS Dup (BJL0554-BSD1)</b>										
					Prepared: 22-Dec-2021		Analyzed: 22-Dec-2021 10:27			
Chloromethane	9.90	0.50	ug/L	10.0		99.0	60-138	10.30	30	
Vinyl Chloride	9.84	0.10	ug/L	10.0		98.4	66-133	4.13	30	
Bromomethane	9.50	1.00	ug/L	10.0		95.0	72-131	0.24	30	
Chloroethane	10.6	0.20	ug/L	10.0		106	60-155	5.81	30	
Trichlorofluoromethane	9.15	0.20	ug/L	10.0		91.5	62-141	4.39	30	
Acrolein	50.0	5.00	ug/L	50.0		100	52-190	11.00	30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	10.3	0.20	ug/L	10.0		103	76-129	3.56	30	
Acetone	46.1	5.00	ug/L	50.0		92.1	58-142	7.49	30	
1,1-Dichloroethene	9.97	0.20	ug/L	10.0		99.7	69-135	5.94	30	
Iodomethane	9.90	1.00	ug/L	10.0		99.0	56-147	4.35	30	
Methylene Chloride	9.62	1.00	ug/L	10.0		96.2	65-135	4.29	30	
Acrylonitrile	9.41	1.00	ug/L	10.0		94.1	64-134	6.09	30	
Carbon Disulfide	10.5	0.20	ug/L	10.0		105	78-125	4.90	30	
trans-1,2-Dichloroethene	9.59	0.20	ug/L	10.0		95.9	78-128	1.00	30	
Vinyl Acetate	10.4	0.20	ug/L	10.0		104	55-138	10.50	30	
1,1-Dichloroethane	10.1	0.20	ug/L	10.0		101	76-124	4.28	30	
2-Butanone	50.8	5.00	ug/L	50.0		102	61-140	15.60	30	
2,2-Dichloropropane	10.3	0.20	ug/L	10.0		103	66-147	0.88	30	
cis-1,2-Dichloroethene	10.2	0.20	ug/L	10.0		102	80-121	4.86	30	





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

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

Reported:  
17-Feb-2022 16:57

Analysis by: Analytical Resources, LLC

Volatile Organic Compounds - Quality Control

Batch BJL0554 - EPA 5030C (Purge and Trap)

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BJL0554-BSD1) Prepared: 22-Dec-2021 Analyzed: 22-Dec-2021 10:27										
Chloroform	9.83	0.20	ug/L	10.0		98.3	80-122	3.49	30	
Bromochloromethane	9.62	0.20	ug/L	10.0		96.2	80-121	4.36	30	
1,1,1-Trichloroethane	10.0	0.20	ug/L	10.0		100	79-123	5.28	30	
1,1-Dichloropropene	9.89	0.10	ug/L	10.0		98.9	80-127	3.61	30	
Carbon tetrachloride	10.3	0.20	ug/L	10.0		103	53-137	4.14	30	
1,2-Dichloroethane	10.3	0.20	ug/L	10.0		103	75-123	9.36	30	
Benzene	10.2	0.20	ug/L	10.0		102	80-120	5.01	30	
Trichloroethene	10.2	0.20	ug/L	10.0		102	80-120	5.88	30	
1,2-Dichloropropane	10.1	0.20	ug/L	10.0		101	80-120	6.10	30	
Bromodichloromethane	9.81	0.20	ug/L	10.0		98.1	80-121	7.37	30	
Dibromomethane	9.60	0.20	ug/L	10.0		96.0	80-120	7.96	30	
2-Chloroethyl vinyl ether	10.1	1.00	ug/L	10.0		101	64-120	9.09	30	
4-Methyl-2-Pentanone	51.5	2.50	ug/L	50.0		103	67-133	15.70	30	
cis-1,3-Dichloropropene	10.3	0.20	ug/L	10.0		103	80-124	6.25	30	
Toluene	10.0	0.20	ug/L	10.0		100	80-120	4.79	30	
trans-1,3-Dichloropropene	10.2	0.20	ug/L	10.0		102	71-127	9.56	30	
2-Hexanone	51.6	5.00	ug/L	50.0		103	69-133	12.40	30	
1,1,2-Trichloroethane	9.52	0.20	ug/L	10.0		95.2	80-121	11.70	30	
1,3-Dichloropropane	9.90	0.10	ug/L	10.0		99.0	80-120	3.34	30	
Tetrachloroethene	10.2	0.20	ug/L	10.0		102	80-120	2.77	30	
Dibromochloromethane	10.5	0.20	ug/L	10.0		105	65-135	7.63	30	
1,2-Dibromoethane	9.84	0.10	ug/L	10.0		98.4	80-121	9.58	30	
Chlorobenzene	10.2	0.20	ug/L	10.0		102	80-120	3.35	30	
Ethylbenzene	10.0	0.20	ug/L	10.0		100	80-120	3.00	30	
1,1,1,2-Tetrachloroethane	10.2	0.20	ug/L	10.0		102	80-120	2.94	30	
m,p-Xylene	20.5	0.40	ug/L	20.0		102	80-121	1.48	30	
o-Xylene	10.2	0.20	ug/L	10.0		102	80-121	1.49	30	
Xylenes, total	30.6	0.60	ug/L	30.0		102	76-127	1.48	30	
Styrene	10.2	0.20	ug/L	10.0		102	80-124	2.79	30	
Bromoform	9.80	0.20	ug/L	10.0		98.0	51-134	8.72	30	
1,1,2,2-Tetrachloroethane	10.5	0.20	ug/L	10.0		105	77-123	8.40	30	
1,2,3-Trichloropropane	9.86	0.25	ug/L	10.0		98.6	76-125	8.61	30	
trans-1,4-Dichloro 2-Butene	9.83	1.00	ug/L	10.0		98.3	55-129	7.57	30	
n-Propylbenzene	10.3	0.20	ug/L	10.0		103	78-130	0.03	30	
Bromobenzene	9.94	0.20	ug/L	10.0		99.4	80-120	1.89	30	



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

**Reported:**  
17-Feb-2022 16:57

**Analysis by: Analytical Resources, LLC**

**Volatile Organic Compounds - Quality Control**

**Batch BJL0554 - EPA 5030C (Purge and Trap)**

Instrument: NT3 Analyst: PKC

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BJL0554-BSD1)</b>				Prepared: 22-Dec-2021 Analyzed: 22-Dec-2021 10:27						
Isopropyl Benzene	10.1	0.20	ug/L	10.0		101	80-128	0.22	30	
2-Chlorotoluene	9.82	0.10	ug/L	10.0		98.2	78-122	1.21	30	
4-Chlorotoluene	10.2	0.20	ug/L	10.0		102	80-121	1.39	30	
t-Butylbenzene	10.1	0.20	ug/L	10.0		101	78-125	0.55	30	
1,3,5-Trimethylbenzene	10.2	0.20	ug/L	10.0		102	80-129	0.99	30	
1,2,4-Trimethylbenzene	10.3	0.20	ug/L	10.0		103	80-127	1.84	30	
s-Butylbenzene	10.4	0.20	ug/L	10.0		104	78-129	0.08	30	
4-Isopropyl Toluene	10.5	0.20	ug/L	10.0		105	79-130	1.25	30	
1,3-Dichlorobenzene	9.90	0.20	ug/L	10.0		99.0	80-120	0.94	30	
1,4-Dichlorobenzene	9.96	0.20	ug/L	10.0		99.6	80-120	2.25	30	
n-Butylbenzene	10.3	0.20	ug/L	10.0		103	74-129	1.10	30	
1,2-Dichlorobenzene	9.90	0.20	ug/L	10.0		99.0	80-120	4.57	30	
1,2-Dibromo-3-chloropropane	10.1	0.50	ug/L	10.0		101	62-123	11.50	30	
1,2,4-Trichlorobenzene	10.2	0.50	ug/L	10.0		102	64-124	4.77	30	
Hexachloro-1,3-Butadiene	9.75	0.50	ug/L	10.0		97.5	58-123	4.69	30	
Naphthalene	10.1	0.50	ug/L	10.0		101	50-134	5.96	30	
1,2,3-Trichlorobenzene	10.3	0.50	ug/L	10.0		103	49-133	9.08	30	
Dichlorodifluoromethane	9.61	0.20	ug/L	10.0		96.1	48-147	1.01	30	
<i>Surrogate: 1,2-Dichloroethane-d4</i>	5.15		ug/L	5.00		103	80-129			
<i>Surrogate: Toluene-d8</i>	5.17		ug/L	5.00		103	80-120			
<i>Surrogate: 4-Bromofluorobenzene</i>	5.00		ug/L	5.00		100	80-120			
<i>Surrogate: 1,2-Dichlorobenzene-d4</i>	4.91		ug/L	5.00		98.2	80-120			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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**Analysis by: Analytical Resources, LLC**

**Semivolatile Organic Compounds - SIM - Quality Control**

**Batch BJL0519 - EPA 3520C (Liq Liq)**

Instrument: NT6 Analyst: JZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0519-BLK1)</b>				Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 15:41						
1,4-Dioxane	ND	0.4	ug/L							U
<i>Surrogate: 1,4-Dioxane-d8</i>	4.72		ug/L	10.0	47.2		33.6-120			
<b>LCS (BJL0519-BS1)</b>				Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 16:07						
1,4-Dioxane	3.2	0.4	ug/L	10.0	31.8		39.9-120			*
<i>Surrogate: 1,4-Dioxane-d8</i>	4.25		ug/L	10.0	42.5		33.6-120			
<b>LCS Dup (BJL0519-BSD1)</b>				Prepared: 21-Dec-2021 Analyzed: 03-Jan-2022 16:32						
1,4-Dioxane	3.6	0.4	ug/L	10.0	35.7		39.9-120	11.40	30	*
<i>Surrogate: 1,4-Dioxane-d8</i>	4.76		ug/L	10.0	47.6		33.6-120			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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Analysis by: Analytical Resources, LLC

**Petroleum Hydrocarbons - Quality Control**

**Batch BJL0518 - EPA 3510C SepF**

Instrument: FID4 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BJL0518-BLK1)</b>										
				Prepared: 21-Dec-2021 Analyzed: 22-Dec-2021 09:55						
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: <i>o</i> -Terphenyl	0.242		mg/L	0.225	108		50-150			
Surrogate: <i>n</i> -Triacontane	0.247		mg/L	0.225	110		50-150			



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BKA0002 - TWM EPA 7470A**

Instrument: HYDRA Analyst: ML

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKA0002-BLK1)</b>					Prepared: 03-Jan-2022 Analyzed: 03-Jan-2022 12:50					
Mercury	ND	0.00100	mg/L							U
<b>LCS (BKA0002-BS1)</b>					Prepared: 03-Jan-2022 Analyzed: 03-Jan-2022 12:52					
Mercury	0.00170	0.00100	mg/L	0.00200		85.2	80-120			
<b>Duplicate (BKA0002-DUP1)</b>					Source: 21L0271-01 Prepared: 03-Jan-2022 Analyzed: 03-Jan-2022 12:57					
Mercury	ND	0.00100	mg/L		ND					U
<b>Matrix Spike (BKA0002-MS1)</b>					Source: 21L0271-01 Prepared: 03-Jan-2022 Analyzed: 03-Jan-2022 12:59					
Mercury	ND	0.00100	mg/L	0.00100	ND	86.0	75-125			U
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										
<b>Matrix Spike Dup (BKA0002-MSD1)</b>					Source: 21L0271-01 Prepared: 03-Jan-2022 Analyzed: 03-Jan-2022 13:06					
Mercury	ND	0.00100	mg/L	0.00100	ND	83.9	75-125			U
Recovery limits for target analytes in MS/MSD QC samples are advisory only.										



Golder Associates 18300 NE Union Hill Road Suite 200 Redmond WA, 98052-3333	Project: Landsburg Project Number: Landsburg Project Manager: Gary Zimmerman	<b>Reported:</b> 17-Feb-2022 16:57
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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BKA0023 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKA0023-BLK1)</b>										
Prepared: 03-Jan-2022 Analyzed: 05-Jan-2022 14:25										
Aluminum	ND	1.00	mg/L							U
Beryllium	ND	0.0100	mg/L							U
Calcium	ND	0.500	mg/L							U
Chromium	ND	0.0100	mg/L							U
Cobalt	ND	0.0100	mg/L							U
Copper	ND	0.0030	mg/L							U
Iron	ND	0.200	mg/L							U
Magnesium	ND	0.500	mg/L							U
Manganese	ND	0.0100	mg/L							U
Nickel	ND	0.0100	mg/L							U
Potassium	ND	0.500	mg/L							U
Silver	ND	0.0050	mg/L							U
Sodium	ND	0.500	mg/L							U
Sodium	ND	50.0	mg/L							U
Vanadium	ND	0.0030	mg/L							U
Zinc	ND	0.0200	mg/L							U

<b>Blank (BKA0023-BLK2)</b>										
Prepared: 03-Jan-2022 Analyzed: 07-Jan-2022 14:14										
Barium	ND	0.500	mg/L							U
Cadmium	ND	0.0020	mg/L							U

<b>LCS (BKA0023-BS1)</b>										
Prepared: 03-Jan-2022 Analyzed: 05-Jan-2022 14:28										
Aluminum	2.04	1.00	mg/L	2.00		102	80-120			
Beryllium	0.505	0.0100	mg/L	0.500		101	80-120			
Calcium	9.82	0.500	mg/L	10.0		98.2	80-120			
Chromium	0.503	0.0100	mg/L	0.500		101	80-120			
Cobalt	0.564	0.0100	mg/L	0.500		113	80-120			
Copper	0.493	0.0030	mg/L	0.500		98.7	80-120			
Iron	1.92	0.200	mg/L	2.00		95.8	80-120			
Magnesium	10.6	0.500	mg/L	10.0		106	80-120			
Manganese	0.512	0.0100	mg/L	0.500		102	80-120			
Nickel	0.508	0.0100	mg/L	0.500		102	80-120			
Potassium	10.2	0.500	mg/L	10.0		102	80-120			
Silver	0.532	0.0050	mg/L	0.500		106	80-120			
Sodium	10.1	0.500	mg/L	10.0		101	80-120			



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Project: Landsburg  
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Project Manager: Gary Zimmerman

**Reported:**  
17-Feb-2022 16:57

**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BKA0023 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BKA0023-BS1)</b>		Prepared: 03-Jan-2022 Analyzed: 05-Jan-2022 14:28								
Vanadium	0.506	0.0030	mg/L	0.500		101	80-120			
Zinc	0.502	0.0200	mg/L	0.500		100	80-120			
<b>LCS (BKA0023-BS2)</b>		Prepared: 03-Jan-2022 Analyzed: 07-Jan-2022 14:17								
Barium	2.05	0.500	mg/L	2.00		102	80-120			
Cadmium	0.561	0.0020	mg/L	0.500		112	80-120			
<b>Duplicate (BKA0023-DUP2)</b>		<b>Source: 21L0271-01</b>		Prepared: 03-Jan-2022 Analyzed: 07-Jan-2022 16:23						
Barium	ND	0.500	mg/L		ND					U
Beryllium	ND	0.0100	mg/L		ND					U
Cadmium	ND	0.0020	mg/L		ND					U
Calcium	35.9	0.500	mg/L		35.2			1.76	20	
Chromium	ND	0.0100	mg/L		ND					U
Cobalt	ND	0.0100	mg/L		ND					U
Copper	ND	0.0030	mg/L		ND					U
Iron	ND	0.200	mg/L		ND					U
Magnesium	10.9	0.500	mg/L		10.7			1.68	20	
Manganese	0.0128	0.0100	mg/L		0.0125			2.52	20	
Potassium	1.03	0.500	mg/L		1.08			4.21	20	
Silver	ND	0.0050	mg/L		ND					U
Sodium	9.10	0.500	mg/L		8.95			1.71	20	
Vanadium	ND	0.0030	mg/L		ND					U
Zinc	ND	0.0200	mg/L		ND					L, U
<b>Matrix Spike (BKA0023-MS2)</b>		<b>Source: 21L0271-01</b>		Prepared: 03-Jan-2022 Analyzed: 07-Jan-2022 16:28						
Barium	2.02	0.500	mg/L	2.00	ND	101	75-125			
Beryllium	0.490	0.0100	mg/L	0.500	ND	98.0	75-125			
Cadmium	0.539	0.0020	mg/L	0.500	ND	108	75-125			
Calcium	46.2	0.500	mg/L	10.0	35.2	109	75-125			
Chromium	0.504	0.0100	mg/L	0.500	ND	101	75-125			
Cobalt	0.509	0.0100	mg/L	0.500	ND	102	75-125			
Copper	0.448	0.0030	mg/L	0.500	ND	89.6	75-125			
Iron	1.98	0.200	mg/L	2.00	ND	97.9	75-125			
Magnesium	22.7	0.500	mg/L	10.0	10.7	120	75-125			
Manganese	0.516	0.0100	mg/L	0.500	0.0125	101	75-125			



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BKA0023 - TWC EPA 3010A**

Instrument: ICP2 Analyst: MVP

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BKA0023-MS2)</b>		<b>Source: 21L0271-01</b>		Prepared: 03-Jan-2022		Analyzed: 07-Jan-2022 16:28				
Potassium	11.3	0.500	mg/L	10.0	1.08	102	75-125			
Silver	0.501	0.0050	mg/L	0.500	ND	100	75-125			
Sodium	19.3	0.500	mg/L	10.0	8.95	104	75-125			
Vanadium	0.485	0.0030	mg/L	0.500	ND	96.8	75-125			
Zinc	0.514	0.0200	mg/L	0.500	ND	99.9	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BKA0023-MSD2)</b>		<b>Source: 21L0271-01</b>		Prepared: 03-Jan-2022		Analyzed: 07-Jan-2022 16:40				
Barium	2.07	0.500	mg/L	2.00	ND	103	75-125	2.14	20	
Beryllium	0.496	0.0100	mg/L	0.500	ND	99.1	75-125	1.13	20	
Calcium	46.8	0.500	mg/L	10.0	35.2	115	75-125	1.33	20	
Chromium	0.511	0.0100	mg/L	0.500	ND	102	75-125	1.51	20	
Cobalt	0.512	0.0100	mg/L	0.500	ND	102	75-125	0.62	20	
Copper	0.456	0.0030	mg/L	0.500	ND	91.2	75-125	1.76	20	
Iron	1.92	0.200	mg/L	2.00	ND	94.8	75-125	3.23	20	
Magnesium	23.1	0.500	mg/L	10.0	10.7	124	75-125	1.77	20	
Manganese	0.523	0.0100	mg/L	0.500	0.0125	102	75-125	1.48	20	
Potassium	11.5	0.500	mg/L	10.0	1.08	104	75-125	1.67	20	
Silver	0.514	0.0050	mg/L	0.500	ND	103	75-125	2.56	20	
Sodium	19.6	0.500	mg/L	10.0	8.95	106	75-125	1.47	20	
Vanadium	0.497	0.0030	mg/L	0.500	ND	99.0	75-125	2.30	20	
Zinc	0.527	0.0200	mg/L	0.500	ND	102	75-125	2.43	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.





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

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Analysis by: Analytical Resources, LLC

Metals and Metallic Compounds - Quality Control

Batch BKA0083 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKA0083-BLK1)</b>			Prepared: 05-Jan-2022 Analyzed: 06-Jan-2022 20:20								
Lead	208	ND	0.0100	mg/L							U
Arsenic	75a	ND	0.00300	mg/L							U
<b>Blank (BKA0083-BLK2)</b>			Prepared: 05-Jan-2022 Analyzed: 12-Jan-2022 08:43								
Antimony	121	ND	0.00300	mg/L							U
Antimony	123	ND	0.00300	mg/L							U
Thallium	205	ND	0.00200	mg/L							U
Selenium	78	ND	0.0250	mg/L							U
<b>LCS (BKA0083-BS1)</b>			Prepared: 05-Jan-2022 Analyzed: 06-Jan-2022 20:24								
Lead	208	0.0290	0.0100	mg/L	0.0250		116	80-120			
Arsenic	75a	0.0266	0.00300	mg/L	0.0250		106	80-120			
<b>LCS (BKA0083-BS2)</b>			Prepared: 05-Jan-2022 Analyzed: 12-Jan-2022 08:48								
Antimony	121	0.0255	0.00300	mg/L	0.0250		102	80-120			
Antimony	123	0.0252	0.00300	mg/L	0.0250		101	80-120			
Thallium	205	0.0260	0.00200	mg/L	0.0250		104	80-120			
Selenium	78	0.0834	0.0250	mg/L	0.0800		104	80-120			
<b>Duplicate (BKA0083-DUP1)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022 Analyzed: 07-Jan-2022 07:49					
Arsenic	75a	ND	0.00300	mg/L		ND					U
<b>Duplicate (BKA0083-DUP2)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022 Analyzed: 12-Jan-2022 08:59					
Antimony	121	ND	0.00300	mg/L		ND					U
Lead	208	ND	0.0100	mg/L		ND					U
Thallium	205	ND	0.00200	mg/L		ND					U
Selenium	78	ND	0.0250	mg/L		ND					U
<b>Matrix Spike (BKA0083-MS1)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022 Analyzed: 07-Jan-2022 07:54					
Arsenic	75a	0.0273	0.00300	mg/L	0.0250	ND	108	75-125			
Recovery limits for target analytes in MS/MSD QC samples are advisory only.											
<b>Matrix Spike (BKA0083-MS2)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022 Analyzed: 12-Jan-2022 09:04					
Antimony	121	0.0255	0.00300	mg/L	0.0250	ND	102	75-125			
Lead	208	0.0266	0.0100	mg/L	0.0250	ND	106	75-125			
Thallium	205	0.0256	0.00200	mg/L	0.0250	ND	102	75-125			



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**Analysis by: Analytical Resources, LLC**

**Metals and Metallic Compounds - Quality Control**

**Batch BKA0083 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix**

Instrument: ICPMS2 Analyst: MCB

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Matrix Spike (BKA0083-MS2)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022		Analyzed: 12-Jan-2022 09:04			
Selenium	78	0.0829	0.0250	mg/L	0.0800	ND	104	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BKA0083-MSD1)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022		Analyzed: 07-Jan-2022 08:00			
Arsenic	75a	0.0270	0.00300	mg/L	0.0250	ND	108	75-125	0.88	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

<b>Matrix Spike Dup (BKA0083-MSD2)</b>			<b>Source: 21L0271-01</b>			Prepared: 05-Jan-2022		Analyzed: 12-Jan-2022 09:09			
Antimony	121	0.0254	0.00300	mg/L	0.0250	ND	101	75-125	0.52	20	
Lead	208	0.0262	0.0100	mg/L	0.0250	ND	104	75-125	1.27	20	
Thallium	205	0.0252	0.00200	mg/L	0.0250	ND	101	75-125	1.61	20	
Selenium	78	0.0820	0.0250	mg/L	0.0800	ND	103	75-125	1.08	20	

Recovery limits for target analytes in MS/MSD QC samples are advisory only.



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**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 200.8 in Water</b>	
Lead-208	NELAP,WADOE,WA-DW,DoD-ELAP
Antimony-121	NELAP,WADOE,WA-DW,DoD-ELAP
Thallium-205	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 200.8 UCT-KED in Water</b>	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Selenium-78	NELAP,WADOE,WA-DW,DoD-ELAP
<b>EPA 6010D in Water</b>	
Silver	WADOE,NELAP,DoD-ELAP
Aluminum	WADOE,NELAP,DoD-ELAP
Barium	WADOE,NELAP,DoD-ELAP,ADEC
Beryllium	WADOE,NELAP,DoD-ELAP
Calcium	WADOE,NELAP,DoD-ELAP
Cadmium	WADOE,NELAP,DoD-ELAP,ADEC
Cobalt	WADOE,NELAP,DoD-ELAP
Chromium	WADOE,NELAP,DoD-ELAP,ADEC
Copper	WADOE,NELAP,DoD-ELAP
Iron	WADOE,NELAP,DoD-ELAP
Potassium	WADOE,NELAP,DoD-ELAP
Magnesium	WADOE,NELAP,DoD-ELAP
Manganese	WADOE,NELAP,DoD-ELAP
Sodium	DoD-ELAP,WADOE,NELAP
Sodium-1	DoD-ELAP
Nickel	WADOE,NELAP,DoD-ELAP,ADEC
Vanadium	WADOE,NELAP,DoD-ELAP,ADEC
Zinc	WADOE,NELAP,DoD-ELAP
<b>EPA 7470A in Water</b>	
Mercury	WADOE,NELAP,DoD-ELAP
<b>EPA 8260D in Water</b>	
Chloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Bromomethane	DoD-ELAP,ADEC,NELAP,WADOE
Chloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Trichlorofluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Acrolein	DoD-ELAP,NELAP,WADOE



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1,1,2-Trichloro-1,2,2-Trifluoroethane	DoD-ELAP,ADEC,NELAP,WADOE
Acetone	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Iodomethane	DoD-ELAP,NELAP,WADOE
Methylene Chloride	DoD-ELAP,ADEC,NELAP,WADOE
Acrylonitrile	DoD-ELAP,NELAP,WADOE
Carbon Disulfide	DoD-ELAP,NELAP,WADOE
trans-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Vinyl Acetate	DoD-ELAP,NELAP,WADOE
1,1-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Butanone	DoD-ELAP,NELAP,WADOE
2,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
cis-1,2-Dichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Chloroform	DoD-ELAP,ADEC,NELAP,WADOE
Bromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,1-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Carbon tetrachloride	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
Benzene	DoD-ELAP,ADEC,NELAP,WADOE
Trichloroethene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Bromodichloromethane	DoD-ELAP,ADEC,NELAP,WADOE
Dibromomethane	DoD-ELAP,ADEC,NELAP,WADOE
2-Chloroethyl vinyl ether	DoD-ELAP,ADEC,NELAP,WADOE
4-Methyl-2-Pentanone	DoD-ELAP,NELAP,WADOE
cis-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
Toluene	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,3-Dichloropropene	DoD-ELAP,ADEC,NELAP,WADOE
2-Hexanone	DoD-ELAP,NELAP,WADOE
1,1,2-Trichloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,3-Dichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
Tetrachloroethene	DoD-ELAP,ADEC,NELAP,WADOE
Dibromochloromethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromoethane	DoD-ELAP,NELAP,WADOE
Chlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Ethylbenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,1,1,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
m,p-Xylene	DoD-ELAP,ADEC,NELAP,WADOE



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o-Xylene	DoD-ELAP,ADEC,NELAP,WADOE
Styrene	DoD-ELAP,NELAP,WADOE
Bromoform	DoD-ELAP,NELAP,WADOE
1,1,2,2-Tetrachloroethane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichloropropane	DoD-ELAP,ADEC,NELAP,WADOE
trans-1,4-Dichloro 2-Butene	DoD-ELAP,ADEC,NELAP,WADOE
n-Propylbenzene	DoD-ELAP,NELAP,WADOE
Bromobenzene	DoD-ELAP,NELAP,WADOE
Isopropyl Benzene	DoD-ELAP,NELAP,WADOE
2-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
4-Chlorotoluene	DoD-ELAP,ADEC,NELAP,WADOE
t-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,3,5-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
1,2,4-Trimethylbenzene	DoD-ELAP,NELAP,WADOE
s-Butylbenzene	DoD-ELAP,NELAP,WADOE
4-Isopropyl Toluene	DoD-ELAP,NELAP,WADOE
1,3-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,4-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
n-Butylbenzene	DoD-ELAP,NELAP,WADOE
1,2-Dichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
1,2-Dibromo-3-chloropropane	DoD-ELAP,ADEC,NELAP,WADOE
1,2,4-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Hexachloro-1,3-Butadiene	DoD-ELAP,ADEC,NELAP,WADOE
Naphthalene	DoD-ELAP,ADEC,NELAP,WADOE
1,2,3-Trichlorobenzene	DoD-ELAP,ADEC,NELAP,WADOE
Dichlorodifluoromethane	DoD-ELAP,ADEC,NELAP,WADOE
Methyl tert-butyl Ether	DoD-ELAP,ADEC,NELAP,WADOE
n-Hexane	WADOE
2-Pentanone	WADOE

**EPA 8270E-SIM in Water**

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



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Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2022
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2022
WADOE	WA Dept of Ecology	C558	06/30/2022
WA-DW	Ecology - Drinking Water	C558	06/30/2022



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### Notes and Definitions

- \* Flagged value is not within established control limits.
- B This analyte was detected in the method blank.
- D The reported value is from a dilution
- J Estimated concentration value detected below the reporting limit.
- L Analyte concentration is  $\leq 5$  times the reporting limit and the replicate control limit defaults to  $\pm$  RL instead of 20% RPD
- 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.

**APPENDIX C**

**Sample Integrity Data Sheets  
(SIDS)**



## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-15-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 10, 2021 **Time** 13:35

**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.)

Static Water Level: 150.25 ft BTOC

Screened Interval: 235' - 245' BGS

Sand Pack Interval: 231' - 245' BGS

Packer Depth: N/A

**Sample Description** Clear, no sheen, 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
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-15

Date 12/10/2021

Time Begin Purge 13:00

Time Collect Sample 13:35

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
150.25	13:05	7.30	316.2	9.8	1.72	-110.24	2.98
150.22	13:10	7.34	318.1	9.8	1.56	-117.87	2.01
150.20	13:15	7.34	319.7	9.7	1.43	-126.72	1.87
150.18	13:20	7.35	320.1	9.7	1.25	-130.15	1.65
150.18	13:25	7.36	320.3	9.7	1.17	-132.67	1.43
150.20	13:30	7.36	320.4	9.6	1.14	-136.90	1.18


Comments:

Tank: 130  
Throttle: 95  
CPM: 2  
CID: 53

Flow Rate: 300 mL/min

Sampler TD

Date December 10, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-11-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 10, 2021 **Time** 12:30

**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.)

**Static Water Level:** 156.05 ft BTOC

**Screened Interval:** 696' - 707' BGS

**Sand Pack Interval:** 688' - 707' BGS

**Packer Depth:** N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-11

Date 12/10/2021

Time Begin Purge 12:00

Time Collect Sample 12:30

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
156.05	12:05	7.33	375.4	10.1	8.77	-97.8	0.31
156.05	12:10	7.22	356.3	10.0	2.17	-53.9	0.37
156.05	12:15	7.2	356.4	10.0	1.87	-54.9	0.15
165.05	12:20	7.18	356.8	10.1	1.6	-57.5	0.21


Comments:

Tank: 130  
Throttle: 110  
CPM: 1  
CID: 15

Flow Rate: 300 mL/min

Sampler TD

Date December 10, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-14-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 10, 2021 **Time** 10:55

**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.)

Static Water Level: 164.34 ft BTOC

Screened Interval: 156.5' - 172.3' BGS

Sand Pack Interval: 152.5' - 175.8' BGS

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-14

Date 12/10/2021

Time Begin Purge 10:15

Time Collect Sample 10:55

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
164.34	10:20	6.59	1,182	10.5	1.45	-20.4	1.82
164.35	10:25	6.57	1,170	10.4	1.24	-38.4	1.85
164.29	10:30	6.57	1,149	10.4	1.14	-43.2	2.08
164.29	10:35	6.57	1,131	10.3	1.09	-45.7	1.92
164.29	10:40	6.55	1,081	10.3	1.02	-46.5	1.39
164.25	10:45	6.55	1,071	10.4	1.01	-47.4	1.49
164.30	10:50	6.54	1,056	10.3	1.00	-47.4	1.22

**Comments:**

Tank: 140  
 Throttle: 115  
 CPM: 2  
 CID: 49

Flow Rate: 500 mL/min

Sampler TD

Date December 10, 2021

Supervisor 

Date December 15, 2021

# SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-20-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** New Tubing and Peristaltic Pump

**Date** December 9, 2021 **Time** 16:05

**Media** Water **Station** LMW-20

**Sample Type:** **grab** time composite space composite

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

**Static Water Level:** 15.02 ft BTOC

**Screened Interval:** 14' - 24' BGS

**Sand Pack Interval:** 11' - 24.5' BGS

**Packer Depth:** N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
2-500 mL	1,4-dioxane	500 mL amber bottles	None

# SAMPLE INTEGRITY DATA SHEET

Well ID LMW-20

Date 12/09/2021

Time Begin Purge 15:40

Time Collect Sample 16:05

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
15.02	15:45	6.89	186	10	2.88	46.2	3.81
15.01	15:50	6.74	191.5	9.9	3.07	59.6	2.05
15	15:55	6.69	199.2	9.9	3.63	67.9	1.98
15.02	15:58	6.67	200.7	9.9	3.85	74.4	1.85
15.01	16:01	6.65	203.6	9.9	4.09	78.9	2.21
15.02	16:04	6.64	205.2	9.9	4.22	81.4	2.06

Comments:

Flow Rate: 300 mL/min

Sampler TP

Date December 9, 2021

Supervisor 

Date December 15, 2021



# SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-22-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** New Tubing and Peristaltic Pump

**Date** December 9, 2021 **Time** 15:20

**Media** Water **Station** LMW-22

**Sample Type:** **grab** time composite space composite

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

Static Water Level: 8.66 ft BTOC

Screened Interval: 17' - 27' BGS

Sand Pack Interval: 14' - 27.3' BGS

Packer Depth: N/A

**Sample Description** \_\_\_\_\_

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

<b>Aliquot Amount</b>	<b>Analysis</b>	<b>Container</b>	<b>Preservation / Amount</b>
2-500 mL	1,4-dioxane	500 mL amber bottles	None

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-22

Date 12/09/2021

Time Begin Purge 14:55

Time Collect Sample 15:20

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
8.66	15:00	7.45	265.1	10.9	2.03	-82.2	22.3
9.36	15:05	7.4	266.7	11	1.46	-91.8	2.45
9.36	15:10	7.39	267	11	1.47	-95.8	2.28
9.38	15:13	7.38	267.5	11	1.45	-96.2	3.19
9.40	15:16	7.38	268.2	11	1.42	-96.5	3.14
9.38	15:19	7.37	269.1	10.9	1.36	-97.4	3.41

Comments:

Flow Rate: 260 mL/min

Sampler TD

Date December 9, 2021

Supervisor 

Date December 15, 2021

# SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-21-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** New Tubing and Peristaltic Pump

**Date** December 9, 2021 **Time** 14:40

**Media** Water **Station** LMW-21

**Sample Type:** grab time composite space composite

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

**Static Water Level:** 10.75 ft BTOC

**Screened Interval:** 9.8' - 14.8' BGS

**Sand Pack Interval:** 6.8' - 15' BGS

**Packer Depth:** N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
2-500 mL	1,4-dioxane	500 mL amber bottles	None

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-21

Date 12/09/2021

Time Begin Purge 14:10

Time Collect Sample 14:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
10.75	14:15	7.75	238.4	10.3	3.12	36.3	20.8
11.45	14:20	7.73	237.9	10.2	2.34	28.5	16.5
11.91	14:25	7.72	238.3	10.3	1.9	0.6	12.8
12.2	14:30	7.71	238.5	10.3	1.63	-28.3	8.55
12.39	14:33	7.7	238.6	10.3	1.49	-45.9	6.87
12.61	14:36	7.69	238.5	10.3	1.34	-68.2	5.86

Comments:

Flow Rate: 225 mL/min

Sampler TD

Date December 9, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-9-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 9, 2021 **Time** 12:45

**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.)

**Static Water Level:** 98.15 ft BTOC

**Screened Interval:** 149' - 159' BGS

**Sand Pack Interval:** 143.5' - 159' BGS

**Packer Depth:** N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

<b>Aliquot Amount</b>	<b>Analysis</b>	<b>Container</b>	<b>Preservation / Amount</b>
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO <sub>3</sub>
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO <sub>3</sub> + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-9

Date 12/09/2021

Time Begin Purge 12:15

Time Collect Sample 12:45

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
98.15	12:20	6.95	446.7	10.5	1.66	-43.3	1.07
98.1	12:25	7	448	10.5	1.3	-53.1	1.19
98.15	12:30	7.02	448.9	10.6	1.15	-58.8	2.88
98.15	12:35	7.02	448.9	10.6	1.13	-59.9	2.17
98.12	12:40	7.02	448.4	10.5	1.12	-61.7	2.48

Comments:

Tank: 130  
Throttle: 95  
CPM: 2  
CID: 51

Flow Rate: 400 mL/min

Sampler TD

Date December 9, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-6-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated Pump Grundfos

**Date** December 9, 2021 **Time** 11:00

**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.)

Static Water Level: 23.88 ft BTOC

Screened Interval: 90.9' - 105.9' BGS

Sand Pack Interval: 82.5' - 105.9' BGS

Packer Depth: 81.22' BGS

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-6

Date 12/09/2021

Time Begin Purge 10:30

Time Collect Sample 11:00

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
23.43	10:35	7.08	173.6	9.7	1.03	-45.1	3.49
23.44	10:40	6.91	175.7	9.9	0.94	-53.6	2.35
23.41	10:45	6.87	175.9	9.9	0.92	-56.7	1.47
23.42	10:50	6.86	176.1	9.9	0.92	-57.4	0.80
23.47	10:55	6.84	175.9	9.9	0.91	-59.2	1.16

Comments:

Grundfos: 180 Hz

Packer: 110 psi

Flow Rate: 1000 mL/min

Sampler TD

Date December 9, 2021

Supervisor 

Date December 15, 2021



## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-7-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated Pump Grundfos

**Date** December 9, 2021 **Time** 09:40

**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.)

**Static Water Level:** 226.36 ft BTOC

**Screened Interval:** 239.6' - 253.7' BGS

**Sand Pack Interval:** N/A

**Packer Depth:** N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

<b>Aliquot Amount</b>	<b>Analysis</b>	<b>Container</b>	<b>Preservation / Amount</b>
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-7

Date 12/09/2021

Time Begin Purge 08:55

Time Collect Sample 09:40

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
226.36	09:00	7.65	337.2	10.3	2.5	44.9	2.85
226.28	09:05	7.53	356.9	12.3	2.23	2.9	3.17
226.30	09:10	7.53	368.9	13.7	1.66	-13.9	2.43
226.30	09:15	7.62	369.5	13.8	1.34	-42.4	1.74
226.30	09:20	7.51	371.2	13.9	1.22	-54.7	1.97
226.30	09:25	7.51	371.3	14	1.19	-60.3	3.99
226.30	09:30	7.5	371.7	14	1.15	-77.7	2.58
226.30	09:33	7.52	372.4	14.1	1.13	-84.0	1.99
226.30	09:36	7.48	373.2	14.1	1.09	-86.3	1.47
226.30	09:39	7.44	378.7	14.1	1.06	-90.6	.99

Comments:

Grundfos: 320 Hz

Flow Rate: 1600 mL/min

Sampler TD

Date December 9, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-13R-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 8, 2021 **Time** 15:50

**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.)

Static Water Level: 4.95 ft BTOC

Screened Interval: 115' - 140' BGS

Sand Pack Interval: 110' - 150' BGS

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
2-500 mL	1,4-dioxane	500 mL amber bottles	None
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-13R

Date 12/08/2021

Time Begin Purge 15:20

Time Collect Sample 15:50

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
4.95	15:25	8.59	235	9.1	1.43	-126.8	5.31
4.95	15:30	7.37	610	10.1	1.11	-142.3	2.21
4.95	15:35	7.31	611	10.1	0.93	-160	1.64
4.94	15:38	7.31	610	10.1	0.91	-165.8	2.09
4.91	15:41	7.31	610	10.1	0.9	-167.5	1.64
4.91	15:44	7.3	611	10.1	0.89	-169.9	1.23
4.93	15:47	7.3	610	10.1	0.89	-171.4	2.99

Comments:

Tank: 110  
Throttle: 35  
CPM: 2  
CID: 48

Flow Rate: 350 mL/min

Sampler TD

Date December 8, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-10-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 8, 2021 **Time** 14:50

**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.)

Static Water Level: 1.2 ft BTOC

Screened Interval: 267' - 289' BGS

Sand Pack Interval: 258' - 289' BGS

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
2-500 mL	1,4-dioxane	500 mL amber bottles	None
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

# SAMPLE INTEGRITY DATA SHEET

Well ID LMW-10

Date 12/08/2021

Time Begin Purge 14:20

Time Collect Sample 14:50

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
1.2	14:25	8.55	239.5	9.9	0.91	-219.7	1.58
2.58	14:30	8.59	240.6	9.9	0.87	-235.6	1.61
2.7	14:35	8.61	240.9	10	0.87	-237.6	1.65
3.46	14:40	8.61	241.1	10	0.86	-243.4	2.17
3.6	14:45	8.61	241.1	10	0.86	-244.0	2.30

Comments:

Tank: 110  
Throttle: 40  
CPM: 2  
CID: 50  
Flow Rate: 350 mL/min

Sampler TD

Date December 8, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-4-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated Pump Grundfos

**Date** December 8, 2021 **Time** 12:50

**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.)

**Static Water Level:** ft BTOC

**Screened Interval:** 195' - 209.7' BGS

**Sand Pack Interval:** 189' - 209.7' BGS

**Packer Depth:** 187.3' BGS

**Sample Description** Clear, slight sulfur odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
9-40 mL	VOA	VOA vial	HCl
3-500 mL	Total Metals	HDPE	HNO3
6-500 mL	1,4-dioxane	500 mL amber bottles	None
3-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
12-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
6-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-4

Date 12/08/2021

Time Begin Purge 12:15

Time Collect Sample 12:50

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
7.68	12:20	7.2	669	10.4	1.77	-124.6	0.44
7.69	12:25	6.93	672	10.4	1.28	-117.6	0.8
7.69	12:30	6.86	677	10.5	1.13	-127.5	2.46
7.68	12:35	6.83	678	10.6	1.04	-135.4	2.50
7.66	12:40	6.81	678	10.6	0.99	-138.6	2.45
7.86	12:45	6.8	679	10.6	0.97	-139.1	1.55

**Comments:**

MS/MSD collected.


Grundfos: 80 Hz

Packer: 110 psi

Flow Rate: 600 mL/min

Sampler TD

Date December 8, 2021

Supervisor 

Date December 15, 2021



## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** Landsburg Estates-1221

**Sampling Location** Direct pour/end of dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** N/A – Sampled from port. Water coming directly from well.

**Date** December 17, 2021 **Time** 9:15

**Media** Water **Station** Landsburg Estates

**Sample Type:** **grab** time composite space composite

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

Static Water Level: N/A

Screened Interval: N/A

Sand Pack Interval: N/A

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl
2-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-500 mL	1,4-dioxane	500 mL amber bottles	None
2-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
1-500 mL	Total Metals	HDPE	HNO3

# SAMPLE INTEGRITY DATA SHEET

Well ID Landsburg Estates

Date 12/17/2021


Time Begin Purge N/A

Time Collect Sample 9:15

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
N/A	9:15	6.8	204.7	8.4	6.55	210.8	0.15

**Comments:**

Landsburg Estates Private Well Sample. Sampled from port. Water coming directly from well.

Sampler 

Date December 17, 2021

Supervisor 

Date December 22, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-2-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated Pump Grundfos

**Date** December 8, 2021 **Time** 11:25

**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.)

Static Water Level: 5.84 ft BTOC

Screened Interval: 27.9' - 38.1' BGS

Sand Pack Interval: 24.8' - 38.1' BGS

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
2-500 mL	1,4-dioxane	500 mL amber bottles	None
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-2

Date 12/08/2021

Time Begin Purge 10:40

Time Collect Sample 11:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
5.85	10:50	6.82	693	10.9	1.34	-65.6	1.47
5.85	10:55	6.78	694	11	1.12	-111.4	1.68
5.86	11:00	6.78	692	11	1.07	-122.6	0.41
5.85	11:05	6.78	691	11	1.02	-132.8	1.54
5.85	11:10	6.77	689	11	0.99	-139.2	.5
5.85	11:15	6.77	689	11	0.97	-142.9	0.37

**Comments:**

Duplicate LMW-2-1221-D collected 11:30

Grundfos: ~80 Hz

Flow Rate: 400 mL/min

Sampler TD CK

Date December 8, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-12-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated QED Bladder

**Date** December 7, 2021 **Time** 17:10

**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.)

Static Water Level: 4.19 ft BTOC

Screened Interval: 15' - 25' BGS

Sand Pack Interval: 11' - 25' BGS

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
2-500 mL	1,4-dioxane	500 mL amber bottles	None
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-12

Date 12/07/2021

Time Begin Purge 16:35

Time Collect Sample 17:10

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
4.19	16:35	6.66	529	9	4.28	-28.9	13.1
4.21	16:40	6.45	571	10	1.8	-37.1	6.22
4.22	16:45	6.44	587	10.1	1.38	-47.4	4.48
4.34	16:50	6.44	597	10	1.19	-54.1	3.71
4.37	16:55	6.43	599	10	1.1	-59	2.69
4.39	17:00	6.42	599	10.1	1.08	-61.1	4.81
4.39	17:05	6.42	599	10	0.98	-65.6	2.74

**Comments:**

Tank: 110  
 Throttle: 20  
 CPM: 2  
 CID: 47  
 Flow Rate: 400 mL/min

Sampler CK

Date December 7, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-5-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated Grundfos Pump

**Date** December 7, 2021 **Time** 15:25

**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.)

Static Water Level: 12.35 ft BTOC

Screened Interval: 231.8' - 241.8' BGS

Sand Pack Interval: 231.8' - 241.8' BGS

Packer Depth: 222.11' BGS

**Sample Description** Clear, no odor, no sheen.

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

# SAMPLE INTEGRITY DATA SHEET

Well ID LMW-5

Date 12/07/2021

Time Begin Purge 15:00

Time Collect Sample 15:25

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
12.35	15:05	6.65	511	10.7	0.86	-44.4	3.81
12.35	15:10	6.68	513	10.9	0.84	-47.5	3.35
12.41	15:15	6.7	514	10.9	0.84	-49.7	3.08
12.40	15:20	6.71	514	11.0	0.83	-54.2	1.72

Comments:


Grundfos: ~135 Hz

Packer: 110 psi

Flow Rate: 3600 mL/min

Sampler TD

Date December 7, 2021

Supervisor 

Date December 15, 2021



## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-8-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** New Tubing and Peristaltic Pump

**Date** December 7, 2021 **Time** 13:50

**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.)

**Static Water Level:** 7.00 ft BTOC

**Screened Interval:** 8' - 13' BGS

**Sand Pack Interval:** 6' - 13' BGS

**Packer Depth:** N/A

**Sample Description** Clear, no odor, no sheen

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-8

Date 12/07/2021

Time Begin Purge 13:05

Time Collect Sample 13:50

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
7.00	13:10	7.07	318.9	10.7	1.1	-40.8	223
6.83	13:15	6.74	323.9	10.8	1.05	-58.5	50.2
6.01	13:20	6.70	324.7	10.9	0.98	-65.6	40.0
5.81	13:25	6.66	326.4	11.1	0.92	-77.1	17.8
6.21	13:30	6.66	327.4	11.1	0.91	-77.8	13.1
6.42	13:35	6.65	327.8	11.2	0.91	-79	13.2
6.20	13:40	6.65	327.8	11.1	0.9	-80.3	10.8
6.08	13:45	6.65	327.8	11.2	0.9	-81.2	1.80

Comments:

Flow Rate: 300 mL/min

Sampler CK

Date December 7, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-3-1221

**Sampling Location** Groundwater Monitoring Well - end dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** Dedicated Pump Grundfos

**Date** December 7, 2021 **Time** 12:05

**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.)

Static Water Level: 10.25 ft BTOC

Screened Interval: 49.8' - 64.8' BGS

Sand Pack Interval: 47.1' - 64.8' BGS

Packer Depth: 39.33' BGS

**Sample Description** Clear, no odor, no sheen.

**Field Measurements on Sample** (pH, conductivity, etc.) SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO3
1-500 mL	Dissolved Metals (HOLD)	HDPE	HNO3 + field filter
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

## SAMPLE INTEGRITY DATA SHEET

Well ID LMW-3

Date 12/07/2021

Time Begin Purge 11:20

Time Collect Sample 12:05

Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
10.25	11:25	7.62	248.9	11.4	0.98	-150.5	1.09
10.25	11:30	7.61	237.7	11.5	0.96	-65.8	1.07
10.25	11:35	7.61	237.3	11.5	0.96	-54.8	0.38
10.25	11:40	7.61	237.1	11.5	0.92	-58.8	1.28
10.25	11:45	7.6	237.9	11.4	0.94	-61.8	0.93
10.25	11:50	7.6	238.7	11.4	0.94	-62.7	0.58
10.25	11:55	7.59	239.2	11.5	0.92	-65.5	0.37
10.25	12:00	7.58	239.9	11.5	0.92	-66.6	0.39

Comments:

Grundfos: ~135 Hz

Flow Rate: 400 mL/min

Sampler TID

Date December 7, 2021

Supervisor 

Date December 15, 2021

## SAMPLE INTEGRITY DATA SHEET

**Plant/Site** Landsburg Mine Site **Project No.** 923-1000-007.2021

**Site Location** Ravensdale, WA **Sample ID** LMW-FB-1221

**Sampling Location** Direct pour/end of dedicated sampling tube

**Technical Procedure Reference(s)** Landsburg Mine Site Compliance Monitoring Plan (2017)

**Type of Sampler** N/A

**Date** December 8, 2021 **Time** 15:25

**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.)

Static Water Level: N/A

Screened Interval: N/A

Sand Pack Interval: N/A

Packer Depth: N/A

**Sample Description** Clear, no odor, no sheen.

**Field Measurements on Sample** (pH, conductivity, etc.) N/A – Field Blank

Aliquot Amount	Analysis	Container	Preservation / Amount
3-40 mL	VOA	VOA vial	HCl
1-500 mL	Total Metals	HDPE	HNO <sub>3</sub>
2-500 mL	1,4-dioxane	500 mL amber bottles	None
4-500 mL	TPH-HCID, -Dx (HOLD)	Glass amber	None
2-40 mL	TPH-Gx (HOLD)	VOA vial	HCl

# SAMPLE INTEGRITY DATA SHEET

Well ID LMW-FB

Date 12/08/2021

Time Begin Purge N/A

Time Collect Sample 15:25


Water Level (ft bmp)	Time	pH	Cond. (uS/cm)	Temp (°C)	DO (mg/L)	ORP (rel mV)	Turbidity (NTU)
N/A							

Comments:

Field Blank

Sampler TID

Date December 8, 2021

Supervisor 

Date December 15, 2021

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