October 3, 2012 Project No. 923-1000-002.R273

Mr. Bill Kombol
Palmer Coking Coal Company
31407 Highway 169
PO Box 10
Black Diamond, WA 98010

RE: LANDSBURG MINE SITE INTERIM GROUNDWATER MONITORING REPORT – JUNE 2012

Dear Bill:

Golder Associates Inc. (Golder) completed an interim groundwater monitoring event at the Landsburg Mine Site during June 2012. Groundwater samples were collected from monitoring wells LMW-2, LMW-3, LMW-4, LMW-5, LMW-6, LMW-7, LMW-8, LMW-9, LMW-10, and LMW-11 (Figure 1). Monitoring wells LMW-2, LMW-4 and LMW-10 are completed to monitor shallow and deeper zones within the Rogers coal seam north of the Rogers Coal mine subsidence trench. Monitoring wells LMW-3 and LMW-5 are completed to monitor the shallow (~40 feet depth) and deeper zone (~250 feet depth), respectively, within the Rogers coal seam at the south end of the mine. See Figure 2 for a cross-section along the strike at the coal seam that also depicts the location of the monitoring wells. Monitoring well LMW-8 is receiving groundwater before discharge from Portal 3 and the mine access incline at the south end on the Rogers Coal Mine. These wells lay along the primary pathways for detection of a chemical release from the mine, were one to occur. Groundwater samples were also collected from well LMW-9 and the deep well LMW-11, which monitor groundwater from within the Rogers Coal Mine near its south end. Wells LMW-9 and LMW-11 are receiving groundwater from near the top of the water table and near the bottom of the mine, respectively. Wells LMW-6 and LMW-7 monitor groundwater from the Frasier and Landsburg coal mines to the west and east of the Rogers coal mine, respectively.

Groundwater sampling was conducted in accordance with the *Draft Interim Groundwater Monitoring Plan, Landsburg Mine Site* (Golder 1997), and included the following activities:

- Measurement of static water levels at monitoring wells
- Well purging to insure sample representativeness with the currently installed dedicated pumping systems
- Measurement of field parameters including: pH, specific conductance, temperature, dissolved oxygen, Eh, and turbidity
- Collection of representative samples in appropriate containers; only the dissolved metals samples were field filtered (total metals were not); however, the dissolved metals samples were not analyzed
- Analyses of groundwater for volatile organic compounds (EPA Method 8260B), priority pollutant metals (EPA Method 6000/7000 Series), and a petroleum hydrocarbon identification scan (HCID)

The attached Appendix A presents the laboratory analytical reports for all analyses. Sampling activities were documented on Sample Integrity Data Sheets (SIDS). Copies of the completed SIDS are provided in Appendix B. Table 1 presents water depth measurements and elevations that were collected from wells prior to sampling activities. Groundwater levels are similar to previous monitoring periods and indicate that groundwater is discharging out both ends of the Rogers Coal mine.

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Following sample collection, all bottles were sealed, labeled, and placed in an iced cooler until delivery to the laboratory. All groundwater samples from monitoring wells were transported under chain-of-custody procedures to Analytical Resources, Inc. (ARI), of Tukwila, Washington, for analyses. Screening levels are based on maximum contaminant levels (MCLs) or State of Washington MTCA Method B groundwater cleanup levels whichever value is less. In cases where an established MCL or Method B Cleanup Level does not exist, a similar (surrogate) compound regulatory screening level is identified for comparison.

The analytical results indicate no significant changes in groundwater conditions from those observed during the remedial investigation (RI) and on-going interim groundwater monitoring. In previous sampling events carbon disulfide was detected just above the detection limits, but was not detected during the June 2012 event. Carbon disulfide could be a constituent of the coal seam and materials and could be detected at low concentrations in groundwater contacting coal materials. The laboratory used in previous sampling events was Test America Laboratories, but Analytical Resources, Inc. (ARI) was used for the June 2012 sampling event. ARI's detection limit was slightly higher (0.2 µg/L) than Test America's detection limit (0.1 µg/L). The higher detection limit for carbon disulfide should not be a factor, since several previous detections have been greater than 0.2 µg/L. Table 2 presents the field parameter measurements and laboratory analytical results for each groundwater sample. Laboratory analyses did not detect any volatile organic compounds (VOCs), or petroleum hydrocarbon (HCID) in any of the groundwater samples. Carbon disulfide, which has been previously detected at low levels in site groundwater in previous sampling events, was not detected in any of the samples.

The primary parameters detected in groundwater samples during this sampling event were metals that are naturally occurring. The method reporting limits (MRLs) and method detection limits (MDLs) for all analytes were at or below acceptable concentrations under the Model Toxics Control Act (MTCA).

Several groundwater samples from site wells contained iron and manganese concentrations above State of Washington secondary drinking water levels (SMCLs) of 0.3 mg/L and 0.05 mg/L, respectively, which are not health-based standards, but are protective of aesthetic qualities of water. Iron and Manganese have been detected in mine groundwater above MTCA Cleanup Levels in every monitoring event at the Site and are naturally occurring metals that are typically associated with groundwater from coal mines (Fuste, et. al. 1983)[1]. The concentrations of iron and manganese detected during the November 2011 sampling event are similar to concentrations detected during the RI (Golder 1996)[2] and the Interim Groundwater Sampling events previously conducted at the site.

The groundwater sample from the deep well (LMW-11) contained total arsenic at a concentration of 11.1 µg/L, which is greater than the Washington State primary drinking water MCL and the MTCA groundwater cleanup level of 10 µg/L and 5.0 µg/L, respectively. Arsenic also has been detected in groundwater from LMW-11 near or above MTCA Cleanup levels during every monitoring event since LMW-11 was installed. Arsenic is also a naturally occurring metal commonly detectable in groundwater, especially in older more stagnant groundwater having low REDOX and dissolved oxygen levels. The MTCA groundwater cleanup level is based on typical groundwater background levels in the State. It is probable that the arsenic concentrations are naturally occurring deep within the mine where groundwater is more stagnant and its geochemistry may be different than shallow groundwater within the mine.

Calcium was detected in the equipment blank. Calcium was detected in all the groundwater samples at levels greater than 100 times the concentration in the equipment blank. It is suspected that this detection of calcium in the equipment blank was caused by the laboratory.

[1] Fuste, L.A., Packard, F.A., Fretwell, M.O., and Garland, D.P. 1983 *Data Supplement To: Quality of Coal Mine Drainage in Washington, 1975-77.* Open-File Report 83-205. Tacoma, Washington: U.S. Geological Survey.
[2] Golder Associates Inc., 1996. *Remedial Investigation and Feasibility Study for the Landsburg Mine Site*. Landsburg PLP Steering Committee.

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

Sincerely,

GOLDER ASSOCIATES INC.

For

Jill Lamberts
Staff Environmental Scientist

Douglas J. Morell, PhD, LHY
Principal

List of Attachments

Table 1	Groundwater Elevation Data Collection June 4, 2012
Table 2	June 2012 Groundwater Analytical Results Landsburg Mine Site
Figure 1	Groundwater Monitoring Locations
Figure 2	Cross-Section Along Strike at Coal Seam
Appendix A	Laboratory Analtyical Reports
Appendix B	Sample Integrity Data Sheets (SIDS)

JL/DJM/sb

TABLES

Table 1: Groundwater Elevation Data Collection June 4, 2012 Landsburg Mine Site

	UNITS	LMW-1	LMW-1a	LMW-2	LMW-3	LMW-4[1]	LMW-5	LMW-6	LMW-7[1]	LMW-8	LMW-9	LMW-10	LMW-11	P-2	Water Drainage	Seam Tunnel
Water Depths																
Time of data collection	ft bgs	10:37 AM	10:32 AM	9:56 AM	11:20 AM	10:01 AM	11:25 AM	10:19 AM	9:39 AM	11:29 AM	10:57 AM	10:07 AM	11:07 AM	11:31 AM	NA	NA
Measured to Top of PVC	ft bgs	NC	136.56	NC	NC	NC	NC	NC	NC	3.59	98.18	0.00	155.98	5.51	NA	NA
Measured to Top of Monument	ft bgs	140.82	NC	7.66	11.69	9.16	13.11	24.19	210.24	NC	NC	NC	NC	NC	NA	NA
Surveyed Elevation																
Top of PVC	ft asl	765.16	759.51	617.73	656.75	619.26	658.27	632.33	771.51	646.97	743.99	618.87	801.87	651.37	NA	NA
Top of Monument	ft asl	765.89	NC	618.29	657.48	619.85	658.87	633.00	771.88	NC	NC	NC	802.20	NC	NA	NA
Ground Level	ft asl	762.90	756.59	615.35	654.40	617.09	655.63	629.95	768.79	645.25	741.13	615.75	799.50	648.54	551.38	542.15
Corrected Water Elevation																
Using PVC elevation	ft asl	NA	**622.95**	NA	NA	NA	NA	NA	NA	**643.38**	**645.81**	**618.87**	**645.89**	**645.86**	NA	NA
Using Monument elevation	ft asl	**625.07**	NA	**610.63**	**645.79**	**610.69**	**645.76**	**608.81**	**592.31**	NA	NA	NA	NA	NA	NA	NA

Notes:
1 = Data corrected to accomodate well inclination of 20° from vertical
NA = Not applicable.
NC = Data not collected.

Table 2: June 2012 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank 6/6/2012	Trip Blank 6/7/2012	Trip Blank 6/8/2012
Field Parameter																
pH	stnd	7.01	7.73	6.92	6.89	6.89	7.16	NA	6.91	7.09	8.72	7.38	NA	NA	NA	NA
Conductivity	uS/cm	822	301	841	729	220	493	NA	615	644	341	489	NA	NA	NA	NA
Dissolved Oxygen	mg/L	0.02	0.04	0.04	0.08	0.03	0.06	NA	0.09	0.04	0.06	0.27	NA	NA	NA	NA
Temperature	^{o}C	10.7	10.6	10.7	11.1	9.7	12.0	NA	11.7	12.1	10.5	10.5	NA	NA	NA	NA
E_h	Rel mV	77.7	144.3	82.7	102.0	168.2	146.2	NA	107.5	121.6	18.3	127.2	NA	NA	NA	NA
Turbidity	NTU	0.53	0.24	0.45	2.38	0.84	0.68	NA	10.6	0.44	0.28	0.35	NA	NA	NA	NA
Metals (Total)																
Aluminum	mg/L	0.05 U	0.05 U	0.05 U	**0.07**	0.05 U	0.05 U	0.05 U	**0.06**	0.05 U	0.05 U	0.05 U	0.05 U	NA	NA	NA
Antimony	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	NA	NA	NA
Arsenic	mg/L	0.0002 U	0.0002 U	0.0002 U	**0.0007**	0.0002 U	**0.0023**	**0.0023**	**0.0049**	**0.0004**	**0.0003**	**0.0111**	0.0002 U	NA	NA	NA
Barium	mg/L	**0.343**	**0.072**	**0.352**	**0.279**	**0.112**	**0.478**	**0.482**	**0.079**	**0.322**	**0.035**	**0.328**	0.003 U	NA	NA	NA
Beryllium	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	NA	NA	NA
Cadmium	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NA	NA	NA
Calcium	mg/L	**118**	**37.9**	**117**	**100**	**26.8**	**54.8**	**55.3**	**70.2**	**89.9**	**7.07**	**57.6**	**0.06**	NA	NA	NA
Chromium	mg/L	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NA	NA	NA
Cobalt	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	NA	NA	NA
Copper	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	NA	NA	NA
Iron	mg/L	**0.07**	0.05 U	**0.92**	**0.34**	**2.14**	**1.27**	**1.28**	**33.9**	**1.7**	0.05 U	**2.42**	0.05 U	NA	NA	NA
Lead	mg/L	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	**0.0001**	0.0001 U	0.0001 U	0.0001 U	0.0001 U	NA	NA	NA
Magnesium	mg/L	**69.6**	**15.4**	**70.6**	**56.5**	**13.2**	**25.4**	**25.6**	**38.1**	**49.6**	**3.12**	**29.3**	0.05 U	NA	NA	NA
Manganese	mg/L	**0.213**	**0.057**	**0.162**	**0.269**	**0.03**	**0.169**	**0.17**	**0.383**	**0.18**	**0.007**	**0.132**	0.001 U	NA	NA	NA
Mercury	mg/L	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	0.00002 U	NA	NA	NA
Nickel	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Potassium	mg/L	**3.73**	**1.86**	**3.97**	**2.67**	**0.65**	**2.95**	**2.99**	**2.27**	**2.47**	**1.23**	**1.91**	0.5 U	NA	NA	NA
Selenium	mg/L	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	NA	NA	NA
Silver	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	NA	NA	NA
Sodium	mg/L	**20.1**	**10.7**	**32.1**	**17**	**6.65**	**36.5**	**36.9**	**13.8**	**17**	**83.5**	**27.6**	0.5 U	NA	NA	NA
Thallium	mg/L	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	NA	NA	NA
Vanadium	mg/L	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	NA	NA	NA
Zinc	mg/L	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	NA	NA	NA
Volatile Organic Compounds																
Acetone	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acrolein	µg/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
Acrylonitrile	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzene	µg/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
Bromobenzene	µg/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
Bromochloromethane	µg/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
Bromodichloromethane	µg/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
Bromoform	µg/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
Bromomethane	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	µg/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
sec-Butylbenzene	µg/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
tert-Butylbenzene	µg/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
Carbon disulfide	µg/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
Carbon tetrachloride	µg/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
Chlorobenzene	µg/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
Chloroethane	µg/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
2-Chloroethyl vinyl ether	µg/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
Chloroform	µg/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
Chloromethane	µg/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

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Table 2: June 2012 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank 6/6/2012	Trip Blank 6/7/2012	Trip Blank 6/8/2012
Volatile Organic Compounds (continued)																
2-Chlorotoluene	µg/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
4-Chlorotoluene	µg/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
Chlorodibromomethane	µg/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
1,2-Dibromo-3-Chloropropane	µg/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
1,2-Dibromoethane	µg/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
Dibromomethane	µg/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
1,2-Dichlorobenzene	µg/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
1,3-Dichlorobenzene	µg/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
1,4-Dichlorobenzene	µg/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
trans-1,4-Dichloro-2-butene	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	µg/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
1,2-Dichloroethane	µg/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
1,1-Dichloroethene	µg/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
cis-1,2-Dichloroethene	µg/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
trans-1,2-Dichloroethene	µg/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
1,2-Dichloropropane	µg/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
1,3-Dichloropropane	µg/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
2,2-Dichloropropane	µg/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
1,1-Dichloropropene	µg/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
cis-1,3-Dichloropropene	µg/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
trans-1,3-Dichloropropene	µg/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
Ethylbenzene	µg/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
Hexachloro-1,3-butadiene	µg/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
2-Hexanone	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Iodomethane	µg/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
Isopropylbenzene	µg/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
4-Isopropyltoluene	µg/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
Methylene Chloride	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
4-Methyl-2-pentanone	µg/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
Naphthalene	µg/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
N-Propylbenzene	µg/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
Styrene	µg/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
1,2,3-Trichlorobenzene	µg/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
1,2,4-Trichlorobenzene	µg/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
1,3,5-Trichlorobenzene	µg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1,2-Tetrachloroethane	µg/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
1,1,2,2-Tetrachloroethane	µg/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
Tetrachloroethene	µg/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
Toluene	µg/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
1,1,1-Trichloroethane	µg/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
1,1,2-Trichloroethane	µg/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
Trichloroethene	µg/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
Trichlorofluoromethane	µg/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
1,1,2-Trichloro-1,2,2-trifluoroethane	µg/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
1,2,3-Trichloropropane	µg/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
1,2,4-Trimethylbenzene	µg/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
1,3,5-Trimethylbenzene	µg/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
Vinyl acetate	µg/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
Vinyl chloride	µg/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
m-Xylene & p-Xylene	µg/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
o-Xylene	µg/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
Xylenes, Total	µg/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

Table 2: June 2012 Groundwater Analytical Results Landsburg Mine Site

ANALYTE	UNITS	LMW-2	LMW-3	LMW-4	LMW-5	LMW-6	LMW-7	LMW-7 Duplicate	LMW-8	LMW-9	LMW-10	LMW-11	Equipment Blank	Trip Blank 6/6/2012	Trip Blank 6/7/2012	Trip Blank 6/8/2012
Hydrocarbon Identification																
Diesel Range	mg/L	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	NA	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	NA	NA	NA
Heavy Fuel Oil	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	NA	NA	NA

Notes:
NA - not analyzed
U - the analyte was not detected above the level of the reporting limit

FIGURES

E 1713000
N 140000

E 1716000
N 140000

PIPELINE

CEDAR RIVER

ROAD

DISCHARGE PIPE

SE SUMMIT LANDSBURG RD

VALVE (TYP)

TREATMENT FACILITIES

LMW-4

LMW-2

LMW-10

Portal 2

LMW-6

LMW-1

Fenced Area

LMW-7

E 1713000
N 137000

LMW-11

LMW-9

LMW-5

LMW-3

P-2

LMW-8

Portal 3

Power Lines

KENT–KANGLEY RD.

0 400 800
FEET

Legend

P-2	Landsburg Piezometer
LMW-5	Landsburg Monitoring Well
Portal 3	Portal Seepage Locations
	Protective Fence
	Trail
	Unpaved Road
	Building

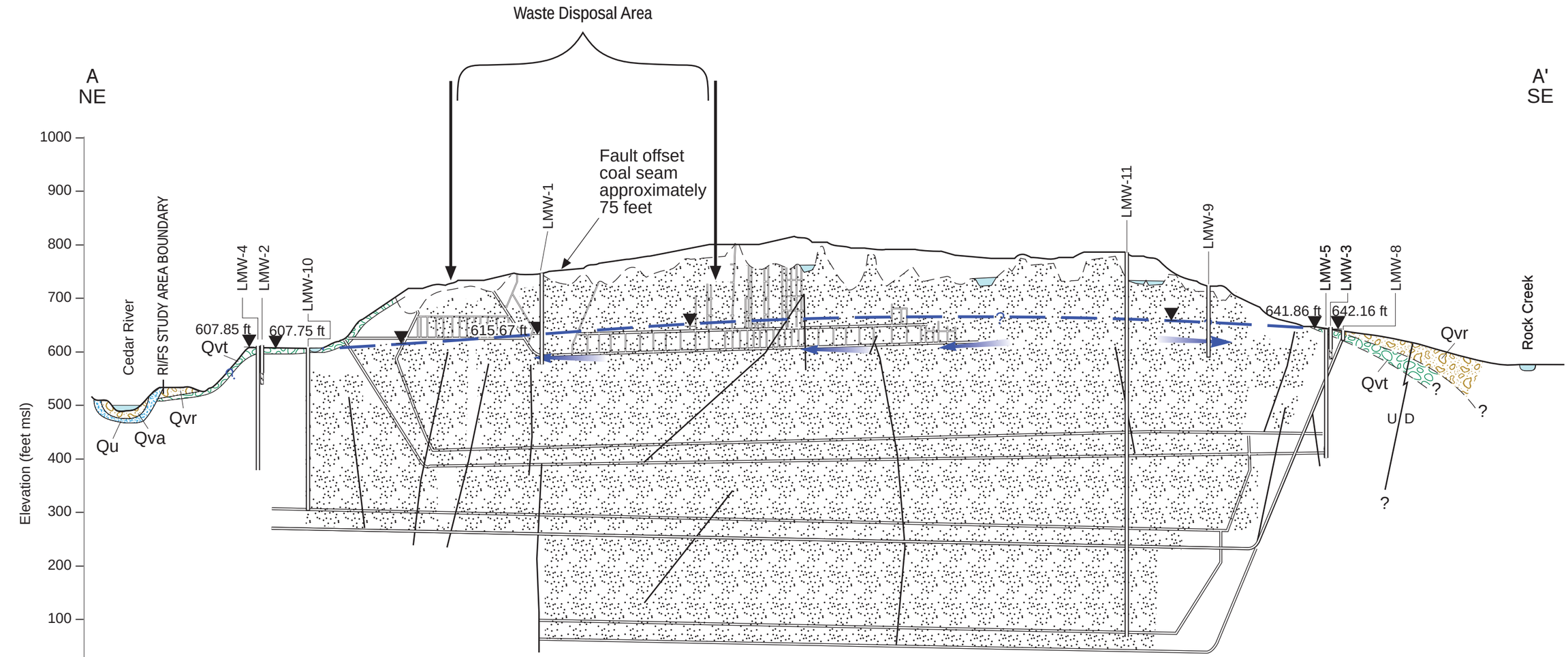
NOTES:

1) Interim groundwater monitoring locations are underlined.

FIGURE 1

GROUNDWATER MONITORING LOCATIONS

PALMER/LANDSBURG MINE/WA



EXPLANATION

- Potentiometric surface
- Outline of trench bottom
- Water Level (ft. amsl) 2/23/94
- 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

0 500
SCALE IN FEET

Sources for the Geology and Mine Information:
J.E. Luzier 1969; surficial geology
State of Washington, Water Well reports
Mine Superintendant'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'

Assuming groundwater discharge at the north and south end of mine.

FIGURE 2
CROSS-SECTION ALONG STRIKE AT COAL SEAM
PALMER/LANDSBURG MINE/WA

9231000002R273fig02.ai | Mod: 08/19/10 | AMP

Golder Associates

APPENDIX A
LABORATORY ANALTYICAL REPORTS

Table of Contents: ARI Job UX34, UX48, UX61, UX62

Client: Golder Associates

Project: 923-1000-002-R273 Landsburg

Signature

June-19-2012
Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

July 2, 2012

Doug Morell
Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Client Project Name: Landsburg
Client Project Number: 923-1000-002-R273
ARI ID: UX34, UX48, UX61, UX62

Dear Mr. Morell:

Please find enclosed the original Chain of Custody record, sample receipt documentation, and the final results for the project referenced above.

Sample receipt and analytical details are addressed in the enclosed Case Narrative.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to call me at any time.

Respectfully,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: UX34, UX48, UX61, UX62

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: UX34	Turn-around Requested: Standard
ARI Client Company: Golder	Phone: 425 883-0777
Client Contact: Doug Morell	
Client Project Name: Landsburg	
Client Project #: 923-1000-002.R273	Samplers: J Lamberts, C Wilder

Page: 1	of 1
Date: 6/5/2012	Ice Present? Yes
No. of Coolers: 2	Cooler Temps: 3.8, 5.4

Sample ID	Date	Time	Matrix	No. Containers	VOCs 8260 Client specific list	Total Metals TAML	Diss Metals TAML Hold	TPH-HCID *					Notes/Comments
Trip Blank	6/5/12	—	DI	2	X								Diss Metals is field filtered with 0.45 µm filter
LMW-11-0612	|	1115	W	11	X	X	X	X					* Follow ups TPH-Dx, TPHG
LMW-9-0612	|	1337	W	11	X	X	X	X					Client-specific Metals + VOCs list
LMW-10-0612	|	~~14~~55	W	11	X	X	X	X					

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
Pls cc. J Lamberts, T. Stepp	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: J. Lamberts	Printed Name: Chris Apell	Printed Name:	Printed Name:
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 6/5/2012 1605	Date & Time: 6/5/12 1605	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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Lardsburg

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

Assigned ARI Job No: UX34 Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers *properly filled out* (ink, signed, etc.)	(YES)	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)	3.8 9.4	
If cooler temperature is out of compliance fill out form 00070F	Temp Gun ID#:	90541679

Cooler Accepted by: CT Date: 6/5/12 Time: 1605

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	5/29/12	

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

Samples Logged by: AV Date: 6/6/12 Time: 1446

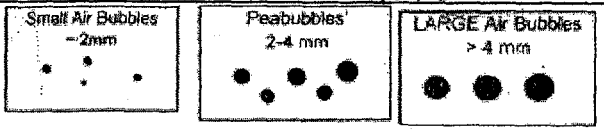
***** Notify Project Manager of discrepancies or concerns *****

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

Additional Notes, Discrepancies, & Resolutions:

TB= 2SM LMW-11-0612 = 1AD

By: AV Date: 6/6/12



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 06/06/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **UX34**

Inquiry Number: NONE
Analysis Requested: 06/06/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: AV
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 06/05/12

Project #: 923-1000-002-R273
Project: Landsburg
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-10310 **UX34A**	LMW-11-0612						TOT P															
12-10311 **UX34B**	LMW-9-0612						TOT P															
12-10312 **UX34C**	LMW-10-0612						TOT P															

P=Pass

UX34 : hEXCL 50005

Checked By AV Date 6/6/12

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 4x48	Turn-around Requested: standard	Page: 1 of 1	
ARI Client Company: Golder	Phone: 4255883077	Date: 6/6/2012	Ice Present? X
Client Contact: Doug Morell		No. of Coolers: 3	Cooler Temps: 5.8 - 6.0
Client Project Name: Landsburg			
Client Project #: 923-1000-002.R273	Samplers: J. Lambert, C. Wilder		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: VOCs (8260) Client Specific List	Total Metals TAL	Diss. Metals TAL	TPH-Dx *					Notes/Comments
Trip Blank	6/6/12	—	DI	2	X								* Follows TPH-Dx, SG
LMW-5-0612		0930	W	11	X	X		X					Client Specific Metals + VOCs list
LMW-3-0612		1056	W	11	X	X		X					
LMW-EB-0612		1030	W	11	X	X	HOLD	X					
LMW-8-0612		1135	W	11	X	X		X					
LMW-6-0612		1320	W	11	X	X		X					
LMW-4-0612		1475	W	11	X	X		X					

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
F/S cc. J Lamberts T Stapp	Printed Name: J. Lambert	Printed Name: Taylor Streeter	Printed Name:	Printed Name:
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 6/6/2012 1600	Date & Time: 6-6-12 1600	Date & Time:	Date & Time:

PRESERVATION VERIFICATION 06/06/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **UX48**

Inquiry Number: NONE
Analysis Requested: 06/07/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: TS
Sample Set Used: Yes-481
Validatable Package: No
Deliverables:

PC: Kelly
VTSR: 06/06/12

Project #: 923-1000-002-R273
Project: Landsburg
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-10316 **UX48B**	LMW-5-0612						TOT Fail															
12-10317 **UX48C**	LMW-3-0612						TOT Pass															
12-10318 **UX48D**	LMW-EB-0612						TOT Pass															
12-10319 **UX48E**	LMW-8-0612						TOT Pass															
12-10320 **UX48F**	LMW-6-0612						TOT Pass															
12-10321 **UX48G**	LMW-4-0612						TOT Pass															

UX48 : 06061

Checked By TS Date 6-6-12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg

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

Assigned ARI Job No: UX48 Tracking No: _____ NA

Preliminary Examination Phase:

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 5.8 5.9 6.0 ___ ___ ___

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619

Cooler Accepted by: TS Date: 6-6-12 Time: 1600

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	5-29-12	

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

Samples Logged by: TS Date: 6-6-12 Time: 1640

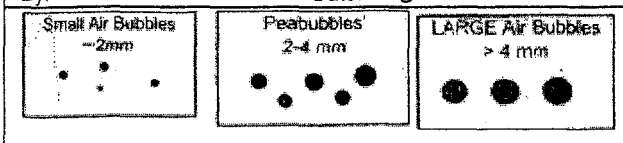
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
LMW-03-	LMW-3-		
LMW-04	LMW-4		

Additional Notes, Discrepancies, & Resolutions:

TB 2 "5m"

By: TS Date: 6-6-12



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

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: ~~UX34~~ UX61	Turn-around Requested: [illegible]	Page: 1	of [illegible]
ARI Client Company: [illegible]	Phone: 425 [illegible]	Date: [illegible]	Ice Present? Yes
Client Contact: [illegible]		No. of Coolers: 2	Cooler Temps: 3.8, 5.4
Client Project Name: [illegible]			
Client Project #: [illegible]	Samplers: [illegible]		

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested									Notes/Comments
					[illegible]	[illegible]	[illegible] Hold	[illegible]						[illegible]
Trip Blank	6/5/12	—	[illegible]	2	X									[illegible]
[illegible]	|	[illegible]	W	[illegible]	X	X	X	X						[illegible]
[illegible]	|	[illegible]	W	[illegible]	X	X	X	X						[illegible]
[illegible]	|	14[illegible]	W	[illegible]	X	X	X	X						[illegible]

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
[illegible]	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: J. Lamberts	Printed Name: Chris Apell	Printed Name:	Printed Name:
	Company: ~~[illegible]~~ Golder	Company: ARI	Company:	Company:
	Date & Time: 6/5/2012 1605	Date & Time: 6/5/12 1605	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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg

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

Assigned ARI Job No: UX34 Tracking No: _____ (NA)

Preliminary Examination Phase:

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 3.8 5.4

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90741619

Cooler Accepted by: CT Date: 6/5/12 Time: 1605

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		(YES)	NO
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	5/29/12	

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

Samples Logged by: AV Date: 6/6/12 Time: 1446

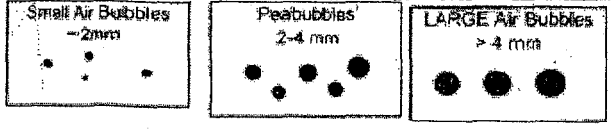
***** Notify Project Manager of discrepancies or concerns *****

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

Additional Notes, Discrepancies, & Resolutions:

TB= 2SM LMW-11-0612 = 1Ab

By: AV Date: 6/6/12



Small → "sm"	
Peabubbles → "pb"	
Large → "lg"	
Headspace → "hs"	

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: UXL60	Turn-around Requested:	Page:	of
ARI Client Company:	Phone:	Date:	Ice Present? X
Client Contact:		No. of Coolers: 3	Cooler Temps: 5.8 - 6.0
Client Project Name:			
Client Project #:	Samplers:		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested								Notes/Comments

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
	Printed Name: J. Lambert	Printed Name: Taylor Streeter	Printed Name:	Printed Name:
	Company: Golder	Company: ARI	Company:	Company:
	Date & Time: 6/6/2012 1600	Date & Time: 6-6-12 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, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg

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

Assigned ARI Job No: UX48 Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)	5.8 5.9 5.0	

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941619

Cooler Accepted by: TS Date: 6-6-12 Time: 1600

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	5-29-12	

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

Samples Logged by: TS Date: 6-6-12 Time: 1640

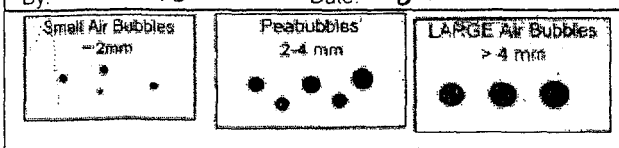
***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
LMW-03-	LMW-3-		
LMW-04	LMW-4		

Additional Notes, Discrepancies, & Resolutions:

TB 2 "sm"

By: TS Date: 6-6-12



Small → "sm"	
Peabubbles → "pb"	
Large → "lg"	
Headspace → "hs"	

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: UX34, UX48, UX61, UX62

Case Narrative
Project: Landsburg
ARI ID: UX34, UX48, UX61, UX62
July 2, 2012

Sample Receipt:

Analytical Resources, Inc. (ARI) accepted three water samples and a trip blank in good condition on June 5, 2012 under ARI Sample Delivery Group (SDG) UX34 and UX61. The samples were received with a cooler temperature of 3.8 and 5.4°C and six water samples and a trip blank on June 6, 2012 under ARI Sample Delivery Group (SDG) UX48 and UX62. The samples were received with a cooler temperature of 5.8 and 6.0°C.

For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

Select samples were analyzed for Volatile Organics, HCID and Total Metals, as requested on the Chain of Custody. The dissolved metals were placed on hold pending further instructions. All HCID samples were non-detect and did not require follow up analyses.

Volatile Organics by Method 8260C:

The samples were analyzed on 6/15/12 - within the method recommended holding times. All samples had a pH of <2.0.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The 2-Chloroethylviylether fell outside the 20% control limit low. All associated samples that contain these analytes have been flagged with a "Q" qualifier. No further corrective action was taken.

Surrogates: The surrogate DCE is out of control high for samples LMW-EB-0612, LMW-8-0612 and LMW-6-0612. All associated samples were non-detect, therefore no further corrective action was taken.

Method Blank(s): The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPDs(s): Are in control.

HCID by NWTPH:

The samples were extracted on 6/8/12 and analyzed on 6/9/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank(s): The method blank was free of contamination.

Case Narrative
Project: Landsburg
ARI ID: UX34, UX48, UX61, UX62
July 2, 2012

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPD(s): The LCS and LCSD were in control.

Total Metals by EPA Methods 6010C, 200.8, and 7471A

The samples were digested on 6/11/12. The digests were analyzed between 6/13/12 and 6/15/12 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Samples: No anomalies were encountered for these samples.

Lab Control(s): The LCS recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Matrix spike/ RPD(s): The matrix spike percent recoveries and RPDs are in control.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UX34
Client: Golder Associates
Project Event: 923-1000-002-R273
Project Name: Landsburg

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-11-0612	UX34A	12-10310	Water	06/05/12 11:15	06/05/12 16:05
2.	LMW-9-0612	UX34B	12-10311	Water	06/05/12 13:27	06/05/12 16:05
3.	LMW-10-0612	UX34C	12-10312	Water	06/05/12 14:55	06/05/12 16:05
4.	Trip Blanks	UX34D	12-10313	Water	06/05/12	06/05/12 16:05

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UX48
Client: Golder Associates
Project Event: 923-1000-002-R273
Project Name: Landsburg

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	Trip Blank	UX48A	12-10315	Water	06/06/12	06/06/12 16:00
2.	LMW-5-0612	UX48B	12-10316	Water	06/06/12 09:30	06/06/12 16:00
3.	LMW-3-0612	UX48C	12-10317	Water	06/06/12 10:56	06/06/12 16:00
4.	LMW-EB-0612	UX48D	12-10318	Water	06/06/12 10:30	06/06/12 16:00
5.	LMW-8-0612	UX48E	12-10319	Water	06/06/12 11:35	06/06/12 16:00
6.	LMW-6-0612	UX48F	12-10320	Water	06/06/12 13:20	06/06/12 16:00
7.	LMW-4-0612	UX48G	12-10321	Water	06/06/12 14:45	06/06/12 16:00

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UX61
Client: Golder Associates
Project Event: 923-1000-002-R273
Project Name: Landsburg

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-11-0612	UX61A	12-10388	Water	06/05/12 11:15	06/05/12 16:05
2.	LMW-9-0612	UX61B	12-10389	Water	06/05/12 13:27	06/05/12 16:05
3.	LMW-10-0612	UX61C	12-10390	Water	06/05/12 14:55	06/05/12 16:05

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UX62
Client: Golder Associates
Project Event: 923-1000-002-R273
Project Name: Landsburg

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-5-0612	UX62A	12-10391	Water	06/06/12 09:30	06/06/12 16:00
2.	LMW-3-0612	UX62B	12-10392	Water	06/06/12 10:56	06/06/12 16:00
3.	LMW-EB-0612	UX62C	12-10393	Water	06/06/12 10:30	06/06/12 16:00
4.	LMW-8-0612	UX62D	12-10394	Water	06/06/12 11:35	06/06/12 16:00
5.	LMW-6-0612	UX62E	12-10395	Water	06/06/12 13:20	06/06/12 16:00
6.	LMW-4-0612	UX62F	12-10396	Water	06/06/12 14:45	06/06/12 16:00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
Chloromethane	0.095	0.25	**0.5**	77 – 122	≤ 40
Vinyl Chloride	0.057	0.1	**0.2**	74 – 123	≤ 40
Bromomethane	0.252	0.5	**1.0**	68 – 130	≤ 40
Chloroethane	0.086	0.1	**0.2**	68 – 133	≤ 40
Trichlorofluoromethane	0.037	0.1	**0.2**	74 – 135	≤ 40
Acrolein	2.476	2.5	**5.0**	60 – 124	≤ 40
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.043	0.1	**0.2**	76 – 124	≤ 40
Acetone	2.057	2.5	**5.0**	64 – 125	≤ 40
1,1-Dichloroethene	0.054	0.1	**0.2**	74 – 120	≤ 40
Bromoethane	0.041	0.1	**0.2**	77 – 122	≤ 40
Iodomethane	0.227	0.5	**1.0**	76 – 123	≤ 40
Methylene Chloride	0.485	0.5	**1.0**	71 – 125	≤ 40
Acrylonitrile	0.604	1.0	**1.0**	76 – 123	≤ 40
Carbon Disulfide	0.037	0.1	**0.2**	77 – 124	≤ 40
trans-1,2-Dichloroethene	0.048	0.1	**0.2**	75 – 120	≤ 40
Vinyl Acetate	0.069	0.1	**0.2**	74 – **120**	≤ 40
1,1-Dichloroethane	0.053	0.1	**0.2**	80 – 120	≤ 40
2-Butanone	0.814	2.5	**5.0**	73 – 123	≤ 40
2,2-Dichloropropane	0.052	0.1	**0.2**	72 – 133	≤ 40
cis-1,2-Dichloroethene	0.043	0.1	**0.2**	78 – 120	≤ 40
Chloroform	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Bromochloromethane	0.061	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1-Trichloroethane	0.041	0.1	**0.2**	79 – 124	≤ 40
1,1-Dichloropropene	0.034	0.1	**0.2**	**80 – 120**	≤ 40
Carbon Tetrachloride	0.044	0.1	**0.2**	71 – 139	≤ 40
1,2-Dichloroethane	0.072	0.1	**0.2**	**80** – 121	≤ 40
Benzene	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Trichloroethene	0.049	0.1	**0.2**	**80 – 120**	≤ 40
1,2-Dichloropropane	0.035	0.1	**0.2**	**80 – 120**	≤ 40
Bromodichloromethane	0.051	0.1	**0.2**	**80** – 122	≤ 40
Dibromomethane	0.145	0.2	**0.2**	**80 – 120**	≤ 40
2-Chloroethylvinyl Ether	0.250	0.5	**1.0**	62 – 130	≤ 40
4-Methyl-2-Pentanone	0.974	2.5	**5.0**	**80** – 125	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)					
Analyte	**DL[1] µg/L**	**LOD[1] µg/L**	**LOQ[1] µg/L**	**LCS Recovery[2,4]**	**Replicate RPD[3]**
cis 1,3-dichloropropene	0.061	0.1	**0.2**	**80** – 127	≤ 40
Toluene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
trans 1,3-Dichloropropene	0.081	0.1	**0.2**	79 – 132	≤ 40
2-Hexanone	0.902	2.5	**5.0**	80 – 129	≤ 40
1,1,2-Trichloroethane	0.129	0.2	**0.2**	**80 – 120**	≤ 40
1,3-Dichloropropane	0.062	0.1	**0.2**	**80 – 120**	≤ 40
Tetrachloroethene	0.047	0.1	**0.2**	**80 – 120**	≤ 40
Dibromochloromethane	0.048	0.1	**0.2**	**80** – 120	≤ 40
1,2-Dibromoethane	0.075	0.1	**0.2**	**80 – 120**	≤ 40
Chlorobenzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Ethyl Benzene	0.037	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1,2-Tetrachloroethane	0.040	0.1	**0.2**	**80** – 128	≤ 40
m,p-xylene	0.052	0.2	**0.4**	**80 – 120**	≤ 40
o-Xylene	0.035	0.1	**0.2**	**80** – 120	≤ 40
Styrene	0.045	0.1	**0.2**	**80** – 121	≤ 40
Bromoform	0.062	0.1	**0.2**	62 – 149	≤ 40
1,1,2,2-Tetrachloroethane	0.060	0.1	**0.2**	**80 – 120**	≤ 40
1,2,3-Trichloropropane	0.131	0.25	**0.5**	**80 – 120**	≤ 40
trans-1,4-Dichloro 2-Butene	0.324	0.5	**1.0**	47 – 147	≤ 40
n-Propyl Benzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Bromobenzene	0.060	0.1	**0.2**	**80 – 120**	≤ 40
iso-propyl Benzene	0.021	0.1	**0.2**	**80 – 120**	≤ 40
2-Chloro Toluene	0.024	0.1	**0.2**	**80 – 120**	≤ 40
4-Chloro Toluene	0.016	0.1	**0.2**	**80 – 120**	≤ 40
tert-Butyl Benzene	0.026	0.1	**0.2**	**80** – 121	≤ 40
1,3,5-Trimethyl Benzene	0.015	0.1	**0.2**	**80 – 120**	≤ 40
1,2,4-Trimethylbenzene	0.024	0.1	**0.2**	**80** – 122	≤ 40
sec-Butyl Benzene	0.024	0.1	**0.2**	**80** – 121	≤ 40
4-Isopropyl Toluene	0.026	0.1	**0.2**	**80** – 124	≤ 40
1,3-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40
1,4-Dichlorobenzene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
n-Butyl Benzene	0.025	0.1	**0.2**	**80** – 125	≤ 40
1,2-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)					
Analyte	**DL[1] µg/L**	**LOD[1] µg/L**	**LOQ[1] µg/L**	**LCS Recovery[2,4]**	**Replicate RPD[3]**
1,2-Dibromo 3-Chloropropane	0.366	0.5	**0.5**	79 – 129	≤ 40
1,2,4-Trichlorobenzene	0.107	0.25	**0.5**	77 – 127	≤ 40
Hexachloro-1,3-Butadiene	0.073	0.25	**0.5**	80 – 135	≤ 40
Naphthalene	0.118	0.25	**0.5**	**80** – 128	≤ 40
1,2,3-Trichlorobenzene	0.110	0.25	**0.5**	**80** - 125	≤ 40
Dichlorodifluoromethane	0.052	0.1	**0.2**	68 – 133	≤ 40
Methyl-*tert*-butyl ether	0.073	0.25	**0.5**	79 – 121	≤ 40
Surrogate Standards			**MB / LCS**	**Samples**	**RPD**
1,2-Dichloroethane-d_4			**80 – 120**	**80** – 130	≤ 40
1,2-Dichlorobenzene-d_4			**80 – 120**	**80 – 120**	≤ 40
Toluene-d_8			**80 – 120**	**80 – 120**	≤ 40
4-Bromofluorobenzene			**80 – 120**	**80 – 120**	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 1/1/12 through 5/31/12.
(3) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(4) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that:
a. ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit or
b. Control limits for analyzes with no separate preparation procedure are adjusted to reflect the minimum uncertainty in the calibration of the instrument allowed by the referenced analytical method.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Quality Control Criteria
Total Petroleum Hydrocarbons
(Diesel & Motor Oil)

Analysis Code	Analyte[5]	DL[1]	LOD[1]	LOQ[2] ppm	Spike % Recovery Control Limits[3]			RPD[4]
					LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	--	0.50 [7]	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	--	50 [7]	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.022	0.05	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.022	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.044	0.1	0.2	64-112	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [9]	0.1	0.2	60-120 [6]	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.039	0.05	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.042	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.010	0.1	0.2	61-104	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [8]	0.1	0.2	60-120 [6]	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.35	2.5	5	62-119	50-150	50-150	≤ 40
DIESMI	DRO – NWTPH-Dext Jet A	2.22 [11]	2.5	5	60 – 130 [8]	50-150	50-150	
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.43	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	2.48	5	10	62-119	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [9]	5	10	60-120 [6]	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.28	2.5	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.06	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	1.57	5	10	60-108	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [10]	5	10	60-120 [6]	60-120	50-150	

(1) DL (Detection Limit) and LOD (Limit of Detection) as defined in ARI SOP 1018S.
(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the DL and the concentration of the lowest standard used to calibrate the GC-FID instrument.
(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.
(6) Method specified LCS acceptance limits.
(7) Method specified reporting limits
(8) Default LCS control limits pending calculation of historic limits
(9) MDL study QD55 completed 2/12/10
(10) MDL study QD35 completed 1/29/10
(11) LOD Study UI44 completed 2/28/12

Quality Control Parameters for Mercury Analysis using CVAA

	Aqueous Samples[2]			Spike Recovery		RPD[5]
	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	**0.10**[2]	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	**0.02**[3]	75 – 125	80 – 120	≤ 20
	Soil / Sediment / Tissue[4] Samples			**Spike Recovery**		**RPD[5]**
	DL[1] mg/kg	**LOD[1] mg/kg**	**LOQ[1] mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	**0.025**[3,4]	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 20 mL sample with 20 mL final volume
(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.
(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

Quality Control Parameters for Metals Analysis using ICP-MS

Analyte	Mass	Aqueous Samples[2]			Spike Recovery		RPD[4]	Solids[3]
		DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ[1] mg/kg
Aluminum	27	1.601	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Antimony	121	0.010	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
	123	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #1	75	0.048	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #2	75	0.092	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Barium	135	0.020	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	137	0.019	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Beryllium	9	0.021	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Cadmium	111	0.010	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
	114	0.005	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Calcium	43	3.983	25	**50.0**	75 – 125	80 – 120	≤ 20	**50.0**
Chromium	52	0.045	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	53	0.118	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Cobalt	59	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Copper	63	0.158	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	65	0.236	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Iron	54	5.753	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
	57	3.876	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Lead	208	0.046	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Magnesium	24	0.297	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Manganese	55	0.022	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Molybdenum	98	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Nickel	60	0.079	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	62	0.089	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Potassium	39	2.944	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Selenium	82	0.127	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	78	0.324	0.25	**2.0**	75 – 125	80 – 120	≤ 20	**2.0**
Silver	107	0.008	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Sodium	23	2.833	50	**100.0**	75 – 125	80 – 120	≤ 20	**100.0**
Thorium[5]	232	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Thallium	205	0.004	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Uranium[5]	238	0.003	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Vanadium	51	0.043	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Zinc	66	0.497	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	67	0.531	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	68	0.524	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) ARI has no accreditation for these elements.

Quality Control Parameters for Metals Analysis using ICP-OES

	Aqueous Samples[2]			Spike Recovery		RPD[5]	Solids[3]	Tissue[4]
Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ mg/kg	LOQ mg/kg
Aluminum	7.57	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Antimony	6.28	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Arsenic	3.33	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Barium	1.33	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Beryllium	0.16	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Boron	7.39	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Cadmium	0.18	0.5	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Calcium	11.27	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Chromium	1.24	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Cobalt	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Copper	0.92	1.0	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Iron	7.50	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Lead	1.55	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Magnesium	9.61	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Manganese	0.28	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Molybdenum	0.79	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Nickel	3.86	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Potassium	65.70	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Selenium	4.99	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Silicon	8.17	30	**60**	75 – 125	80 – 120	≤ 20	**(6)**	**(6)**
Silver	0.43	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Sodium	11.35	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Strontium	0.09	1.0	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Thallium	3.10	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Tin	1.41	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Titanium	2.11	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.01**
Vanadium	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Zinc	1.45	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Tissue is reported on an "as received" (wet weight) basis using 2.5 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(6) ARI does not analyze for Silicon in solids or tissue samples

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: UX34, UX48, UX61, UX62

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-11-0612**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX34A
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized: VTB
Reported: 06/27/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 11:25

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-11-0612**
 SAMPLE

Lab Sample ID: UX34A
LIMS ID: 12-10310
Matrix: Water
Date Analyzed: 06/15/12 11:25

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	101%
Bromofluorobenzene	93.2%
d4-1,2-Dichlorobenzene	106%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-9-0612**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX34B
LIMS ID: 12-10311
Matrix: Water
Data Release Authorized: VB
Reported: 06/27/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 11:52

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX34B
LIMS ID: 12-10311
Matrix: Water
Date Analyzed: 06/15/12 11:52

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	114%
d8-Toluene	99.2%
Bromofluorobenzene	94.1%
d4-1,2-Dichlorobenzene	107%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-10-0612**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX34C
LIMS ID: 12-10312
Matrix: Water
Data Release Authorized: WJ
Reported: 06/27/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 12:18

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX34C
LIMS ID: 12-10312
Matrix: Water
Date Analyzed: 06/15/12 12:18

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	115%
d8-Toluene	100%
Bromofluorobenzene	94.0%
d4-1,2-Dichlorobenzene	109%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX34D
LIMS ID: 12-10313
Matrix: Water
Data Release Authorized: VD
Reported: 06/27/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 12:45

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	RL	Result	Q
74-87-3	Chloromethane	0.5	< 0.5	U
74-83-9	Bromomethane	1.0	< 1.0	U
75-01-4	Vinyl Chloride	0.1	< 0.1	U
75-00-3	Chloroethane	0.2	< 0.2	U
75-09-2	Methylene Chloride	1.0	< 1.0	U
67-64-1	Acetone	5.0	< 5.0	U
75-15-0	Carbon Disulfide	0.2	< 0.2	U
75-35-4	1,1-Dichloroethene	0.2	< 0.2	U
75-34-3	1,1-Dichloroethane	0.2	< 0.2	U
156-60-5	trans-1,2-Dichloroethene	0.2	< 0.2	U
156-59-2	cis-1,2-Dichloroethene	0.2	< 0.2	U
67-66-3	Chloroform	0.2	< 0.2	U
107-06-2	1,2-Dichloroethane	0.2	< 0.2	U
78-93-3	2-Butanone	5.0	< 5.0	U
71-55-6	1,1,1-Trichloroethane	0.2	< 0.2	U
56-23-5	Carbon Tetrachloride	0.2	< 0.2	U
108-05-4	Vinyl Acetate	0.2	< 0.2	U
75-27-4	Bromodichloromethane	0.2	< 0.2	U
78-87-5	1,2-Dichloropropane	0.2	< 0.2	U
10061-01-5	cis-1,3-Dichloropropene	0.2	< 0.2	U
79-01-6	Trichloroethene	0.2	< 0.2	U
124-48-1	Dibromochloromethane	0.2	< 0.2	U
79-00-5	1,1,2-Trichloroethane	0.2	< 0.2	U
71-43-2	Benzene	0.2	< 0.2	U
10061-02-6	trans-1,3-Dichloropropene	0.2	< 0.2	U
110-75-8	2-Chloroethylvinylether	0.5	< 0.5	U
75-25-2	Bromoform	0.2	< 0.2	U
108-10-1	4-Methyl-2-Pentanone (MIBK)	2.5	< 2.5	U
591-78-6	2-Hexanone	5.0	< 5.0	U
127-18-4	Tetrachloroethene	0.2	< 0.2	U
79-34-5	1,1,2,2-Tetrachloroethane	0.1	< 0.1	U
108-88-3	Toluene	0.2	< 0.2	U
108-90-7	Chlorobenzene	0.2	< 0.2	U
100-41-4	Ethylbenzene	0.2	< 0.2	U
100-42-5	Styrene	0.2	< 0.2	U
75-69-4	Trichlorofluoromethane	0.2	< 0.2	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	0.2	< 0.2	U
179601-23-1	m,p-Xylene	0.4	< 0.4	U
95-47-6	o-Xylene	0.2	< 0.2	U
95-50-1	1,2-Dichlorobenzene	0.2	< 0.2	U
541-73-1	1,3-Dichlorobenzene	0.2	< 0.2	U
106-46-7	1,4-Dichlorobenzene	0.2	< 0.2	U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blanks**
Page 2 of 2 **SAMPLE**

Lab Sample ID: UX34D
LIMS ID: 12-10313
Matrix: Water
Date Analyzed: 06/15/12 12:45

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	RL	Result	Q
107-02-8	Acrolein	2.5	< 2.5	U
74-88-4	Methyl Iodide	0.5	< 0.5	U
107-13-1	Acrylonitrile	1.0	< 1.0	U
563-58-6	1,1-Dichloropropene	0.1	< 0.1	U
74-95-3	Dibromomethane	0.2	< 0.2	U
630-20-6	1,1,1,2-Tetrachloroethane	0.2	< 0.2	U
96-12-8	1,2-Dibromo-3-chloropropane	0.5	< 0.5	U
96-18-4	1,2,3-Trichloropropane	0.2	< 0.2	U
110-57-6	trans-1,4-Dichloro-2-butene	1.0	< 1.0	U
108-67-8	1,3,5-Trimethylbenzene	0.2	< 0.2	U
95-63-6	1,2,4-Trimethylbenzene	0.2	< 0.2	U
87-68-3	Hexachlorobutadiene	0.2	< 0.2	U
106-93-4	Ethylene Dibromide	0.1	< 0.1	U
74-97-5	Bromochloromethane	0.2	< 0.2	U
594-20-7	2,2-Dichloropropane	0.1	< 0.1	U
142-28-9	1,3-Dichloropropane	0.1	< 0.1	U
98-82-8	Isopropylbenzene	0.2	< 0.2	U
103-65-1	n-Propylbenzene	0.2	< 0.2	U
108-86-1	Bromobenzene	0.2	< 0.2	U
95-49-8	2-Chlorotoluene	0.1	< 0.1	U
106-43-4	4-Chlorotoluene	0.2	< 0.2	U
98-06-6	tert-Butylbenzene	0.2	< 0.2	U
135-98-8	sec-Butylbenzene	0.2	< 0.2	U
99-87-6	4-Isopropyltoluene	0.1	< 0.1	U
104-51-8	n-Butylbenzene	0.2	< 0.2	U
120-82-1	1,2,4-Trichlorobenzene	0.5	< 0.5	U
91-20-3	Naphthalene	0.5	< 0.5	U
87-61-6	1,2,3-Trichlorobenzene	0.2	< 0.2	U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	119%
d8-Toluene	101%
Bromofluorobenzene	92.0%
d4-1,2-Dichlorobenzene	106%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-061512A	Method Blank	10	115%	98.9%	94.1%	106%	0
LCS-061512A	Lab Control	10	103%	103%	100%	102%	0
LCSD-061512A	Lab Control Dup	10	105%	102%	99.6%	100%	0
UX34A	LMW-11-0612	10	114%	101%	93.2%	106%	0
UX34B	LMW-9-0612	10	114%	99.2%	94.1%	107%	0
UX34C	LMW-10-0612	10	115%	100%	94.0%	109%	0
UX34D	Trip Blanks	10	119%	101%	92.0%	106%	0

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-120)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 12-10310 to 12-10313

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX48A
LIMS ID: 12-10315
Matrix: Water
Data Release Authorized: VB
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 13:12

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
 SAMPLE

Lab Sample ID: UX48A
LIMS ID: 12-10315
Matrix: Water
Date Analyzed: 06/15/12 13:12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	119%
d8-Toluene	100%
Bromofluorobenzene	93.3%
d4-1,2-Dichlorobenzene	108%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-5-0612**
 SAMPLE

Lab Sample ID: UX48B
LIMS ID: 12-10316
Matrix: Water
Data Release Authorized: VB
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 13:39

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX48B
LIMS ID: 12-10316
Matrix: Water
Date Analyzed: 06/15/12 13:39

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	119%
d8-Toluene	100%
Bromofluorobenzene	91.4%
d4-1,2-Dichlorobenzene	107%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-3-0612**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX48C
LIMS ID: 12-10317
Matrix: Water
Data Release Authorized: VT3
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 14:05

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX48C
LIMS ID: 12-10317
Matrix: Water
Date Analyzed: 06/15/12 14:05

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	118%
d8-Toluene	99.0%
Bromofluorobenzene	93.6%
d4-1,2-Dichlorobenzene	109%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-EB-0612**
 SAMPLE

Lab Sample ID: UX48D
LIMS ID: 12-10318
Matrix: Water
Data Release Authorized: VD
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 14:31

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-EB-0612**
 SAMPLE

Lab Sample ID: UX48D
LIMS ID: 12-10318
Matrix: Water
Date Analyzed: 06/15/12 14:31

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	121%
d8-Toluene	101%
Bromofluorobenzene	94.5%
d4-1,2-Dichlorobenzene	109%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-8-0612**
 SAMPLE

Lab Sample ID: UX48E
LIMS ID: 12-10319
Matrix: Water
Data Release Authorized: VD
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 14:58

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX48E
LIMS ID: 12-10319
Matrix: Water
Date Analyzed: 06/15/12 14:58

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	124%
d8-Toluene	100%
Bromofluorobenzene	92.9%
d4-1,2-Dichlorobenzene	108%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-6-0612**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX48F
LIMS ID: 12-10320
Matrix: Water
Data Release Authorized: VD
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 15:25

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-6-0612**
 SAMPLE

Lab Sample ID: UX48F
LIMS ID: 12-10320
Matrix: Water
Date Analyzed: 06/15/12 15:25

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	122%
d8-Toluene	100%
Bromofluorobenzene	92.5%
d4-1,2-Dichlorobenzene	108%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-4-0612**
 SAMPLE

Lab Sample ID: UX48G
LIMS ID: 12-10321
Matrix: Water
Data Release Authorized: VTD
Reported: 06/27/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 15:52

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX48G
LIMS ID: 12-10321
Matrix: Water
Date Analyzed: 06/15/12 15:52

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	120%
d8-Toluene	101%
Bromofluorobenzene	95.2%
d4-1,2-Dichlorobenzene	109%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-061512A	Method Blank	10	115%	98.9%	94.1%	106%	0
LCS-061512A	Lab Control	10	103%	103%	100%	102%	0
LCSD-061512A	Lab Control Dup	10	105%	102%	99.6%	100%	0
UX48A	Trip Blank	10	119%	100%	93.3%	108%	0
UX48B	LMW-5-0612	10	119%	100%	91.4%	107%	0
UX48C	LMW-3-0612	10	118%	99.0%	93.6%	109%	0
UX48D	LMW-EB-0612	10	121%*	101%	94.5%	109%	1
UX48E	LMW-8-0612	10	124%*	100%	92.9%	108%	1
UX48F	LMW-6-0612	10	122%*	100%	92.5%	108%	1
UX48G	LMW-4-0612	10	120%	101%	95.2%	109%	0

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-120)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 12-10315 to 12-10321

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-061512A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-061512A
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized: WD
Reported: 06/27/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/PKC
LCSD: NT2/PKC
Date Analyzed LCS: 06/15/12 09:28
LCSD: 06/15/12 09:55

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS		Spike Added-LCS	LCS Recovery	LCSD		Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Bromomethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Vinyl Chloride	4.3		4.0	108%	4.3		4.0	108%	0.0%
Chloroethane	4.6		4.0	115%	4.6		4.0	115%	0.0%
Methylene Chloride	4.3		4.0	108%	4.3		4.0	108%	0.0%
Acetone	20.2		20.0	101%	20.5		20.0	102%	1.5%
Carbon Disulfide	4.4		4.0	110%	4.4		4.0	110%	0.0%
1,1-Dichloroethene	4.1		4.0	102%	4.1		4.0	102%	0.0%
1,1-Dichloroethane	4.2		4.0	105%	4.2		4.0	105%	0.0%
trans-1,2-Dichloroethene	4.2		4.0	105%	4.1		4.0	102%	2.4%
cis-1,2-Dichloroethene	4.2		4.0	105%	4.2		4.0	105%	0.0%
Chloroform	4.4		4.0	110%	4.3		4.0	108%	2.3%
1,2-Dichloroethane	4.4		4.0	110%	4.3		4.0	108%	2.3%
2-Butanone	19.7		20.0	98.5%	19.9		20.0	99.5%	1.0%
1,1,1-Trichloroethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Carbon Tetrachloride	4.5		4.0	112%	4.4		4.0	110%	2.2%
Vinyl Acetate	3.8		4.0	95.0%	3.7		4.0	92.5%	2.7%
Bromodichloromethane	4.4		4.0	110%	4.2		4.0	105%	4.7%
1,2-Dichloropropane	4.2		4.0	105%	4.1		4.0	102%	2.4%
cis-1,3-Dichloropropene	4.1		4.0	102%	4.1		4.0	102%	0.0%
Trichloroethene	4.3		4.0	108%	4.2		4.0	105%	2.4%
Dibromochloromethane	4.1		4.0	102%	4.0		4.0	100%	2.5%
1,1,2-Trichloroethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Benzene	4.4		4.0	110%	4.4		4.0	110%	0.0%
trans-1,3-Dichloropropene	4.6		4.0	115%	4.4		4.0	110%	4.4%
2-Chloroethylvinylether	3.5	Q	4.0	87.5%	3.5	Q	4.0	87.5%	0.0%
Bromoform	3.9		4.0	97.5%	4.0		4.0	100%	2.5%
4-Methyl-2-Pentanone (MIBK)	21.2		20.0	106%	21.6		20.0	108%	1.9%
2-Hexanone	20.0		20.0	100%	19.4		20.0	97.0%	3.0%
Tetrachloroethene	4.2		4.0	105%	4.1		4.0	102%	2.4%
1,1,2,2-Tetrachloroethane	4.1		4.0	102%	3.9		4.0	97.5%	5.0%
Toluene	4.3		4.0	108%	4.2		4.0	105%	2.4%
Chlorobenzene	4.2		4.0	105%	4.1		4.0	102%	2.4%
Ethylbenzene	4.2		4.0	105%	4.2		4.0	105%	0.0%
Styrene	4.5		4.0	112%	4.3		4.0	108%	4.5%
Trichlorofluoromethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
1,1,2-Trichloro-1,2,2-trifluoroetha	4.5		4.0	112%	4.4		4.0	110%	2.2%
m,p-Xylene	8.9		8.0	111%	8.5		8.0	106%	4.6%
o-Xylene	4.3		4.0	108%	4.1		4.0	102%	4.8%
1,2-Dichlorobenzene	4.0		4.0	100%	4.0		4.0	100%	0.0%
1,3-Dichlorobenzene	4.1		4.0	102%	4.0		4.0	100%	2.5%
1,4-Dichlorobenzene	3.9		4.0	97.5%	3.9		4.0	97.5%	0.0%
Acrolein	19.1		20.0	95.5%	19.5		20.0	97.5%	2.1%
Methyl Iodide	4.4		4.0	110%	4.2		4.0	105%	4.7%
Acrylonitrile	4.3		4.0	108%	4.4		4.0	110%	2.3%
1,1-Dichloropropene	4.3		4.0	108%	4.2		4.0	105%	2.4%
Dibromomethane	4.3		4.0	108%	4.4		4.0	110%	2.3%
1,1,1,2-Tetrachloroethane	4.1		4.0	102%	4.1		4.0	102%	0.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-061512A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-061512A QC Report No: UX34-Golder Associates
LIMS ID: 12-10310 Project: Landsburg
Matrix: Water 923-1000-002-R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
1,2-Dibromo-3-chloropropane	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
1,2,3-Trichloropropane	4.2	4.0	105%	4.2	4.0	105%	0.0%
trans-1,4-Dichloro-2-butene	4.0	4.0	100%	3.7	4.0	92.5%	7.8%
1,3,5-Trimethylbenzene	4.3	4.0	108%	4.2	4.0	105%	2.4%
1,2,4-Trimethylbenzene	4.4	4.0	110%	4.3	4.0	108%	2.3%
Hexachlorobutadiene	3.7	4.0	92.5%	3.5	4.0	87.5%	5.6%
Ethylene Dibromide	4.4	4.0	110%	4.2	4.0	105%	4.7%
Bromochloromethane	4.4	4.0	110%	4.4	4.0	110%	0.0%
2,2-Dichloropropane	4.4	4.0	110%	4.3	4.0	108%	2.3%
1,3-Dichloropropane	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
Isopropylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
n-Propylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
Bromobenzene	3.9	4.0	97.5%	3.8	4.0	95.0%	2.6%
2-Chlorotoluene	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
4-Chlorotoluene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%
tert-Butylbenzene	3.4	4.0	85.0%	3.3	4.0	82.5%	3.0%
sec-Butylbenzene	4.3	4.0	108%	4.2	4.0	105%	2.4%
4-Isopropyltoluene	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
n-Butylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
1,2,4-Trichlorobenzene	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
Naphthalene	3.8	4.0	95.0%	3.6	4.0	90.0%	5.4%
1,2,3-Trichlorobenzene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	103%	105%
d8-Toluene	103%	102%
Bromofluorobenzene	100%	99.6%
d4-1,2-Dichlorobenzene	102%	100%

4A

VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB0615

Lab Name: ANALYTICAL RESOURCES INC

Client: GOLDER ASSOCIATES

ARI Job No: UX34

Project: LANDSBURG

Lab File ID: MB0615A

Lab Sample ID: MB0615

Date Analyzed: 06/15/12

Time Analyzed: 1058

Instrument ID: NT2

Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS0615	LCS0615	LCS0615	0928
02	LCS0615	LCS0615	LCS0615A	0955
03	LMW-11-0612	UX34A	UX34A	1125
04	LMW-9-0612	UX34B	UX34B	1152
05	LMW-10-0612	UX34C	UX34C	1218
06	TRIP BLANKS	UX34D	UX34D	1245
07	TRIP BLANK	UX48A	UX48A	1312
08	LMW-5-0612	UX48B	UX48B	1339
09	LMW-3-0612	UX48C	UX48C	1405
10	LMW-EB-0612	UX48D	UX48D	1431
11	LMW-8-0612	UX48E	UX48E	1458
12	LMW-6-0612	UX48F	UX48F	1525
13	LMW-4-0612	UX48G	UX48G	1552
14	LMW-7-0612	UX80A	UX80A	1618
15	LMW-7-0612-D	UX80B	UX80B	1645
16	LMW-2-0612	UX80C	UX80C	1712
17	TRIP BLANK	UX80D	UX80D	1738
18				
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29				
30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-061512A**
 METHOD BLANK

Lab Sample ID: MB-061512A
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized: VTB
Reported: 06/27/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 10:58

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-061512A**
 METHOD BLANK

Lab Sample ID: MB-061512A
LIMS ID: 12-10310
Matrix: Water
Date Analyzed: 06/15/12 10:58

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	115%
d8-Toluene	98.9%
Bromofluorobenzene	94.1%
d4-1,2-Dichlorobenzene	106%

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG SDG No.: UX34

Lab File ID: BFB0612B BFB Injection Date: 06/12/12

Instrument ID: NT2 BFB Injection Time: 0950

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.1
75	30.0 - 60.0% of mass 95	51.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.3 (0.4)1
174	50.0 - 100.0% of mass 95	83.4
175	5.0 - 9.0% of mass 174	6.3 (7.5)1
176	95.0 - 101.0% of mass 174	80.6 (96.6)1
177	5.0 - 9.0% of mass 176	5.3 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC60	IC60	6000612	06/12/12	1140
02	IC40	IC40	4000612	06/12/12	1207
03	IC20	IC20	2000612	06/12/12	1234
04	IC10	IC10	1000612	06/12/12	1301
05	IC02	IC02	0200612	06/12/12	1328
06	IC01	IC01	0100612	06/12/12	1355
07	IC0.5	IC0.5	0050612	06/12/12	1422
08	IC0.2	IC0.2	0020612	06/12/12	1449
09	IC0.1	IC0.1	0010612	06/12/12	1515
10					
11					
12					
13					
14					
15					
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18					
19					
20					
21					
22					

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG SDG No.: UX34

Lab File ID: BFB0615 BFB Injection Date: 06/15/12

Instrument ID: NT2 BFB Injection Time: 0826

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.8
75	30.0 - 60.0% of mass 95	49.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.4 (0.6)1
174	50.0 - 100.0% of mass 95	77.3
175	5.0 - 9.0% of mass 174	5.4 (7.0)1
176	95.0 - 101.0% of mass 174	77.3 (99.9)1
177	5.0 - 9.0% of mass 176	5.0 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0615	CC0615	CC0615	06/15/12	0901
02	LCS0615	LCS0615	LCS0615	06/15/12	0928
03	LCS0615	LCS0615	LCS0615A	06/15/12	0955
04	MB0615	MB0615	MB0615A	06/15/12	1058
05	LMW-11-0612	UX34A	UX34A	06/15/12	1125
06	LMW-9-0612	UX34B	UX34B	06/15/12	1152
07	LMW-10-0612	UX34C	UX34C	06/15/12	1218
08	TRIP BLANKS	UX34D	UX34D	06/15/12	1245
09	TRIP BLANK	UX48A	UX48A	06/15/12	1312
10	LMW-5-0612	UX48B	UX48B	06/15/12	1339
11	LMW-3-0612	UX48C	UX48C	06/15/12	1405
12	LMW-EB-0612	UX48D	UX48D	06/15/12	1431
13	LMW-8-0612	UX48E	UX48E	06/15/12	1458
14	LMW-6-0612	UX48F	UX48F	06/15/12	1525
15	LMW-4-0612	UX48G	UX48G	06/15/12	1552
16	LMW-7-0612	UX80A	UX80A	06/15/12	1618
17	LMW-7-0612-D	UX80B	UX80B	06/15/12	1645
18	LMW-2-0612	UX80C	UX80C	06/15/12	1712
19	TRIP BLANK	UX80D	UX80D	06/15/12	1738
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF0.1: 0010612 RF0.2: RF0.5:
RF1: RF2:

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
Chloromethane		0.883	0.872	0.864	0.845
Vinyl Chloride	0.872	0.818	0.825	0.844	0.877
Bromomethane		0.475	0.465	0.443	0.482
Chloroethane	0.581	0.568	0.537	0.469	0.524
Trichlorofluoromethane	1.054	0.873	0.874	0.893	0.920
Acrolein	0.075	0.070	0.074	0.068	0.077
112Trichloro122Trifluoroetha	0.679	0.634	0.677	0.644	0.683
Acetone			0.125	0.116	0.122
1,1-Dichloroethene	0.814	0.674	0.644	0.649	0.660
Bromoethane	0.508	0.549	0.516	0.513	0.530
Iodomethane	1.080	1.073	1.068	1.040	1.096
Methylene Chloride		0.807	0.752	0.730	0.739
Acrylonitrile		0.123	0.115	0.132	0.146
Carbon Disulfide	2.458	2.369	2.260	2.304	2.411
Trans-1,2-Dichloroethene	0.777	0.661	0.693	0.682	0.706
Vinyl Acetate	0.464	0.450	0.507	0.514	0.553
1,1-Dichloroethane	1.275	1.223	1.192	1.170	1.199
2-Butanone		0.140	0.144	0.144	0.146
2,2-Dichloropropane	0.786	0.747	0.818	0.815	0.852
Cis-1,2-Dichloroethene	0.715	0.596	0.658	0.640	0.690
Chloroform	1.199	1.155	1.081	1.084	1.125
Bromochloromethane	0.268	0.271	0.288	0.288	0.305
1,1,1-Trichloroethane	1.054	0.950	0.945	0.934	1.005
1,1-Dichloropropene	0.546	0.478	0.508	0.530	0.558
Carbon Tetrachloride	0.611	0.552	0.532	0.553	0.601
1,2-Dichloroethane	0.484	0.422	0.430	0.447	0.456
Benzene	1.618	1.527	1.512	1.583	1.662
Trichloroethene	0.420	0.369	0.378	0.384	0.416
1,2-Dichloropropane	0.331	0.364	0.333	0.330	0.366
Bromodichloromethane	0.492	0.421	0.412	0.434	0.461
Dibromomethane	0.192	0.180	0.167	0.180	0.178
2-Chloroethyl Vinyl Ether			0.085	0.090	0.101
4-Methyl-2-Pentanone		0.067	0.070	0.077	0.091
Cis 1,3-dichloropropene	0.421	0.423	0.420	0.431	0.469
Toluene	0.943	0.852	0.834	0.846	0.909
Trans 1,3-Dichloropropene	0.378	0.321	0.349	0.380	0.402
2-Hexanone		0.117	0.117	0.130	0.146

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF0.1: 0010612 RF0.2: RF0.5:
RF1: RF2:

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
1,1,2-Trichloroethane	0.205	0.223	0.210	0.223	0.230
1,3-Dichloropropane	0.451	0.442	0.422	0.428	0.460
Tetrachloroethene	0.451	0.484	0.408	0.442	0.471
Chlorodibromomethane	0.298	0.278	0.269	0.286	0.297
1,2-Dibromoethane	0.200	0.180	0.197	0.219	0.221
Chlorobenzene	1.118	1.001	1.015	1.065	1.082
Ethyl Benzene	0.557	0.525	0.505	0.556	0.622
1,1,1,2-Tetrachloroethane	0.462	0.393	0.414	0.389	0.435
m,p-xylene	0.617	0.619	0.612	0.675	0.753
o-Xylene	0.531	0.531	0.577	0.658	0.729
Styrene	0.731	0.736	0.776	0.912	1.032
Bromoform	0.305	0.252	0.233	0.285	0.282
1,1,2,2-Tetrachloroethane	0.607	0.553	0.531	0.561	0.568
1,2,3-Trichloropropane		0.168	0.145	0.179	0.174
Trans-1,4-Dichloro 2-Butene			0.131	0.126	0.139
N-Propyl Benzene	3.137	3.151	2.782	3.173	3.444
Bromobenzene	0.743	0.685	0.681	0.713	0.720
Isopropyl Benzene	2.314	2.136	2.231	2.668	3.020
2-Chloro Toluene	2.242	2.277	2.079	2.310	2.514
4-Chloro Toluene	1.889	1.999	1.849	2.129	2.226
T-Butyl Benzene	1.589	1.505	1.392	1.849	2.070
1,3,5-Trimethyl Benzene	2.081	2.096	1.919	2.342	2.661
1,2,4-Trimethylbenzene	1.810	1.909	1.872	2.367	2.696
S-Butyl Benzene	2.279	2.402	2.224	2.988	3.304
4-Isopropyl Toluene	1.710	1.777	1.678	2.313	2.587
1,3-Dichlorobenzene	1.482	1.477	1.380	1.520	1.551
1,4-Dichlorobenzene	1.725	1.664	1.476	1.546	1.613
N-Butyl Benzene	1.986	1.923	1.632	2.056	2.300
1,2-Dichlorobenzene	1.633	1.451	1.346	1.442	1.471
1,2-Dibromo 3-Chloropropane		0.076	0.076	0.094	0.090
1,2,4-Trichlorobenzene	1.010	0.878	0.740	0.821	0.861
Hexachloro 1,3-Butadiene		0.582	0.384	0.509	0.548
Naphthalene		1.058	1.013	1.110	1.281
1,2,3-Trichlorobenzene		0.704	0.634	0.675	0.726
Dichlorodifluoromethane	0.377	0.466	0.512	0.562	0.559
Methyl tert butyl ether	1.506	1.443	1.534	1.510	1.708

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF0.1: 0010612 RF0.2: RF0.5:
RF1: RF2:

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
d4-1,2-Dichloroethane	0.575	0.564	0.560	0.544	0.540
d8-Toluene	1.175	1.158	1.159	1.179	1.192
4-Bromofluorobenzene	0.501	0.501	0.520	0.525	0.534
d4-1,2-Dichlorobenzene	0.933	0.930	0.916	0.902	0.911
Dibromofluoromethane	0.532	0.526	0.536	0.520	0.512

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF10: RF20: RF40:
RF60:

COMPOUND	RF10	RF20	RF40	RF60
Chloromethane	0.737	0.756	0.767	0.748
Vinyl Chloride	0.780	0.825	0.835	0.806
Bromomethane	0.408	0.422	0.421	0.400
Chloroethane	0.461	0.463	0.350	0.334
Trichlorofluoromethane	0.830	0.863	0.870	0.854
Acrolein	0.071	0.076	0.080	0.072
112Trichloro122Trifluoroetha	0.599	0.626	0.638	0.629
Acetone	0.102	0.109	0.113	0.101
1,1-Dichloroethene	0.581	0.596	0.612	0.586
Bromoethane	0.478	0.500	0.519	0.491
Iodomethane	0.979	1.010	1.032	0.986
Methylene Chloride	0.659	0.675	0.697	0.656
Acrylonitrile	0.135	0.144	0.151	0.139
Carbon Disulfide	2.134	2.232	2.268	2.150
Trans-1,2-Dichloroethene	0.640	0.674	0.696	0.656
Vinyl Acetate	0.547	0.623	0.646	0.601
1,1-Dichloroethane	1.096	1.136	1.149	1.092
2-Butanone	0.139	0.155	0.159	0.145
2,2-Dichloropropane	0.772	0.827	0.855	0.826
Cis-1,2-Dichloroethene	0.636	0.662	0.681	0.647
Chloroform	1.018	1.065	1.084	1.034
Bromochloromethane	0.273	0.284	0.289	0.274
1,1,1-Trichloroethane	0.920	0.968	0.989	0.949
1,1-Dichloropropene	0.539	0.564	0.559	0.544
Carbon Tetrachloride	0.538	0.548	0.546	0.535
1,2-Dichloroethane	0.416	0.423	0.419	0.404
Benzene	1.518	1.553	1.529	1.458
Trichloroethene	0.366	0.380	0.379	0.371
1,2-Dichloropropane	0.332	0.347	0.348	0.334
Bromodichloromethane	0.431	0.453	0.456	0.445
Dibromomethane	0.166	0.169	0.168	0.159
2-Chloroethyl Vinyl Ether	0.105	0.127	0.126	0.115
4-Methyl-2-Pentanone	0.092	0.099	0.099	0.091
Cis 1,3-dichloropropene	0.469	0.506	0.511	0.490
Toluene	0.840	0.874	0.872	0.834
Trans 1,3-Dichloropropene	0.389	0.417	0.412	0.376
2-Hexanone	0.146	0.156	0.151	0.139

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF10: RF20: RF40:
RF60:

COMPOUND	RF10	RF20	RF40	RF60
1,1,2-Trichloroethane	0.210	0.219	0.219	0.207
1,3-Dichloropropane	0.419	0.450	0.443	0.431
Tetrachloroethene	0.418	0.434	0.425	0.426
Chlorodibromomethane	0.290	0.314	0.315	0.314
1,2-Dibromoethane	0.205	0.215	0.216	0.193
Chlorobenzene	0.985	1.012	0.989	0.972
Ethyl Benzene	0.576	0.602	0.588	0.596
1,1,1,2-Tetrachloroethane	0.407	0.416	0.412	0.421
m,p-xylene	0.716	0.743	0.710	0.698
o-Xylene	0.745	0.784	0.772	0.778
Styrene	1.101	1.133	1.153	1.133
Bromoform	0.292	0.322	0.340	0.325
1,1,2,2-Tetrachloroethane	0.530	0.569	0.574	0.551
1,2,3-Trichloropropane	0.162	0.172	0.170	0.161
Trans-1,4-Dichloro 2-Butene	0.133	0.151	0.156	0.148
N-Propyl Benzene	3.408	3.577	3.585	3.447
Bromobenzene	0.664	0.704	0.719	0.694
Isopropyl Benzene	3.158	3.356	3.399	3.310
2-Chloro Toluene	2.429	2.580	2.610	2.552
4-Chloro Toluene	2.145	2.284	2.309	2.245
T-Butyl Benzene	2.217	2.384	2.394	2.356
1,3,5-Trimethyl Benzene	2.712	2.865	2.839	2.736
1,2,4-Trimethylbenzene	2.732	2.866	2.849	2.762
S-Butyl Benzene	3.340	3.523	3.458	3.337
4-Isopropyl Toluene	2.668	2.850	2.796	2.724
1,3-Dichlorobenzene	1.420	1.493	1.472	1.437
1,4-Dichlorobenzene	1.435	1.499	1.478	1.441
N-Butyl Benzene	2.403	2.455	2.456	2.366
1,2-Dichlorobenzene	1.355	1.403	1.339	1.300
1,2-Dibromo 3-Chloropropane	0.087	0.092	0.082	0.076
1,2,4-Trichlorobenzene	0.886	0.935	0.844	0.796
Hexachloro 1,3-Butadiene	0.451	0.439	0.396	0.361
Naphthalene	1.447	1.557	1.407	1.284
1,2,3-Trichlorobenzene	0.728	0.728	0.652	0.588
Dichlorodifluoromethane	0.500	0.534	0.539	0.535
Methyl tert butyl ether	1.589	1.671	1.717	1.602

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF10: RF20: RF40:
RF60:

COMPOUND	RF10	RF20	RF40	RF60
d4-1,2-Dichloroethane	0.520	0.519	0.530	0.510
d8-Toluene	1.218	1.219	1.231	1.201
4-Bromofluorobenzene	0.525	0.521	0.510	0.511
d4-1,2-Dichlorobenzene	0.923	0.918	0.877	0.861
Dibromofluoromethane	0.509	0.516	0.527	0.510

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.809	7.7
Vinyl Chloride	AVRG	0.831	3.6
Bromomethane	AVRG	0.440	7.1
Chloroethane	AVRG	0.476	18.5
Trichlorofluoromethane	AVRG	0.892	7.3
Acrolein	AVRG	0.074	5.2
112Trichloro122Trifluoroetha	AVRG	0.646	4.4
Acetone	AVRG	0.112	8.1
1,1-Dichloroethene	AVRG	0.646	11.0
Bromoethane	AVRG	0.512	4.1
Iodomethane	AVRG	1.040	4.0
Methylene Chloride	AVRG	0.714	7.3
Acrylonitrile	AVRG	0.136	8.8
Carbon Disulfide	AVRG	2.287	4.8
Trans-1,2-Dichloroethene	AVRG	0.687	5.8
Vinyl Acetate	AVRG	0.545	12.6
1,1-Dichloroethane	AVRG	1.170	5.1
2-Butanone	AVRG	0.146	4.8
2,2-Dichloropropane	AVRG	0.811	4.4
Cis-1,2-Dichloroethene	AVRG	0.658	5.2
Chloroform	AVRG	1.094	5.2
Bromochloromethane	AVRG	0.282	4.2
1,1,1-Trichloroethane	AVRG	0.968	4.3
1,1-Dichloropropene	AVRG	0.536	5.2
Carbon Tetrachloride	AVRG	0.557	5.1
1,2-Dichloroethane	AVRG	0.433	5.7
Benzene	AVRG	1.551	4.0
Trichloroethene	AVRG	0.385	5.1
1,2-Dichloropropane	AVRG	0.343	4.1
Bromodichloromethane	AVRG	0.445	5.4
Dibromomethane	AVRG	0.173	5.7
2-Chloroethyl Vinyl Ether	AVRG	0.107	15.3
4-Methyl-2-Pentanone	AVRG	0.086	14.8
Cis 1,3-dichloropropene	AVRG	0.460	8.1
Toluene	AVRG	0.867	4.3
Trans 1,3-Dichloropropene	AVRG	0.380	8.0
2-Hexanone	AVRG	0.138	10.9

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.216	3.9
1,3-Dichloropropane	AVRG	0.438	3.2
Tetrachloroethene	AVRG	0.440	5.7
Chlorodibromomethane	AVRG	0.296	5.6
1,2-Dibromoethane	AVRG	0.205	6.7
Chlorobenzene	AVRG	1.026	4.8
Ethyl Benzene	AVRG	0.570	6.6
1,1,1,2-Tetrachloroethane	AVRG	0.417	5.2
m,p-xylene	AVRG	0.683	8.0
o-Xylene	AVRG	0.678	15.7
Styrene	AVRG	0.968	18.6
Bromoform	AVRG	0.293	11.9
1,1,2,2-Tetrachloroethane	AVRG	0.560	4.2
1,2,3-Trichloropropane	AVRG	0.166	6.3
Trans-1,4-Dichloro 2-Butene	AVRG	0.141	8.0
N-Propyl Benzene	AVRG	3.301	7.9
Bromobenzene	AVRG	0.703	3.4
Isopropyl Benzene	AVRG	2.844	18.0
2-Chloro Toluene	AVRG	2.399	7.6
4-Chloro Toluene	AVRG	2.120	8.0
T-Butyl Benzene	LINR		0.9998
1,3,5-Trimethyl Benzene	AVRG	2.472	14.8
1,2,4-Trimethylbenzene	AVRG	2.429	18.4
S-Butyl Benzene	AVRG	2.984	17.9
4-Isopropyl Toluene	LINR		0.9996
1,3-Dichlorobenzene	AVRG	1.470	3.5
1,4-Dichlorobenzene	AVRG	1.542	6.7
N-Butyl Benzene	AVRG	2.175	13.3
1,2-Dichlorobenzene	AVRG	1.416	7.1
1,2-Dibromo 3-Chloropropane	AVRG	0.084	8.7
1,2,4-Trichlorobenzene	AVRG	0.863	9.1
Hexachloro 1,3-Butadiene	AVRG	0.458	17.5
Naphthalene	AVRG	1.270	15.4
1,2,3-Trichlorobenzene	AVRG	0.680	7.6
Dichlorodifluoromethane	AVRG	0.509	11.4
Methyl tert butyl ether	AVRG	1.586	6.1

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.540	4.1
d8-Toluene	AVRG	1.192	2.2
4-Bromofluorobenzene	AVRG	0.516	2.2
d4-1,2-Dichlorobenzene	AVRG	0.908	2.7
Dibromofluoromethane	AVRG	0.521	1.9

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: UX34 Project: LANDSBURG

Instrument ID: NT2 Cont. Calib. Date: 06/15/12

Init. Calib. Date: 06/12/12 Cont. Calib. Time: 0901

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	0.809	0.8856	0.100	AVRG	9.5	
Vinyl Chloride	0.831	0.8846	0.010	AVRG	6.4	
Bromomethane	0.440	0.4828	0.010	AVRG	9.7	
Chloroethane	0.476	0.5622	0.010	AVRG	18.1	
Trichlorofluoromethane	0.892	1.0031	0.010	AVRG	12.4	
Acrolein	0.074	0.0714	0.010	AVRG	-3.5	
112Trichloro122Trifluoroetha	0.645	0.7262	0.010	AVRG	12.6	
Acetone	0.112	0.1054	0.010	AVRG	-5.9	
1,1-Dichloroethene	0.646	0.6622	0.010	AVRG	2.5	
Bromoethane	0.512	0.5445	0.010	AVRG	6.3	
Iodomethane	1.040	1.1424	0.010	AVRG	9.8	
Methylene Chloride	0.714	0.7554	0.010	AVRG	5.8	
Acrylonitrile	0.136	0.1416	0.010	AVRG	4.1	
Carbon Disulfide	2.287	2.5868	0.010	AVRG	13.1	
Trans-1,2-Dichloroethene	0.687	0.7279	0.010	AVRG	6.0	
Vinyl Acetate	0.545	0.4955	0.010	AVRG	-9.1	
1,1-Dichloroethane	1.170	1.2184	0.100	AVRG	4.1	
2-Butanone	0.146	0.1320	0.010	AVRG	-9.6	
2,2-Dichloropropane	0.811	0.9135	0.010	AVRG	12.6	
Cis-1,2-Dichloroethene	0.658	0.6997	0.010	AVRG	6.3	
Chloroform	1.094	1.1669	0.010	AVRG	6.7	
Bromochloromethane	0.282	0.3088	0.010	AVRG	9.5	
1,1,1-Trichloroethane	0.968	1.0618	0.010	AVRG	9.7	
1,1-Dichloropropene	0.536	0.6036	0.010	AVRG	12.6	
Carbon Tetrachloride	0.557	0.6495	0.010	AVRG	16.6	
1,2-Dichloroethane	0.433	0.4598	0.010	AVRG	6.2	
Benzene	1.551	1.7067	0.010	AVRG	10.0	
Trichloroethene	0.385	0.4022	0.010	AVRG	4.5	
1,2-Dichloropropane	0.343	0.3554	0.010	AVRG	3.6	
Bromodichloromethane	0.445	0.4661	0.010	AVRG	4.7	
Dibromomethane	0.173	0.1812	0.010	AVRG	4.7	
2-Chloroethyl Vinyl Ether	0.107	0.0850	0.010	AVRG	-20.6	<-
4-Methyl-2-Pentanone	0.086	0.0932	0.010	AVRG	8.4	
Cis 1,3-dichloropropene	0.460	0.4608	0.010	AVRG	0.2	
Toluene	0.867	0.9013	0.010	AVRG	4.0	
Trans 1,3-Dichloropropene	0.380	0.3861	0.010	AVRG	1.6	
2-Hexanone	0.138	0.1281	0.010	AVRG	-7.2	

<- Exceeds QC limit of 20% D

* RF less than minimum RF

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: UX34 Project: LANDSBURG

Instrument ID: NT2 Cont. Calib. Date: 06/15/12

Init. Calib. Date: 06/12/12 Cont. Calib. Time: 0901

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1,1,2-Trichloroethane	0.216	0.2215	0.010	AVRG	2.5
1,3-Dichloropropane	0.438	0.4097	0.010	AVRG	-6.5
Tetrachloroethene	0.440	0.4474	0.010	AVRG	1.7
Chlorodibromomethane	0.296	0.2972	0.010	AVRG	0.4
1,2-Dibromoethane	0.205	0.2012	0.010	AVRG	-1.8
Chlorobenzene	1.026	1.0112	0.300	AVRG	-1.4
Ethyl Benzene	0.570	0.6213	0.010	AVRG	9.0
1,1,1,2-Tetrachloroethane	0.416	0.4512	0.010	AVRG	8.5
m,p-xylene	0.682	0.7683	0.010	AVRG	12.6
o-Xylene	0.678	0.7943	0.010	AVRG	17.2
Styrene	0.967	1.0982	0.010	AVRG	13.6
Bromoform	0.293	0.2776	0.100	AVRG	-5.2
1,1,2,2-Tetrachloroethane	0.560	0.5259	0.300	AVRG	-6.1
1,2,3-Trichloropropane	0.166	0.1564	0.010	AVRG	-5.8
Trans-1,4-Dichloro 2-Butene	0.140	0.1292	0.010	AVRG	-7.7
N-Propyl Benzene	3.300	3.3394	0.010	AVRG	1.2
Bromobenzene	0.702	0.6442	0.010	AVRG	-8.2
Isopropyl Benzene	2.844	3.1062	0.010	AVRG	9.2
2-Chloro Toluene	2.399	2.3997	0.010	AVRG	0.0
4-Chloro Toluene	2.119	2.0575	0.010	AVRG	-2.9
T-Butyl Benzene	10.000	8.992	0.010	LINR	-10.1
1,3,5-Trimethyl Benzene	2.472	2.7345	0.010	AVRG	10.6
1,2,4-Trimethylbenzene	2.429	2.7514	0.010	AVRG	13.3
S-Butyl Benzene	2.984	3.2728	0.010	AVRG	9.7
4-Isopropyl Toluene	10.000	9.525	0.010	LINR	-4.8
1,3-Dichlorobenzene	1.470	1.4408	0.010	AVRG	-2.0
1,4-Dichlorobenzene	1.542	1.4517	0.010	AVRG	-5.8
N-Butyl Benzene	2.175	2.3163	0.010	AVRG	6.5
1,2-Dichlorobenzene	1.416	1.3950	0.010	AVRG	-1.5
1,2-Dibromo 3-Chloropropane	0.084	0.0818	0.010	AVRG	-2.6
1,2,4-Trichlorobenzene	0.863	0.8490	0.010	AVRG	-1.6
Hexachloro 1,3-Butadiene	0.459	0.4110	0.010	AVRG	-10.4
Naphthalene	1.270	1.3180	0.010	AVRG	3.8
1,2,3-Trichlorobenzene	0.679	0.6866	0.010	AVRG	1.1
Dichlorodifluoromethane	0.509	0.6039	0.010	AVRG	18.6
Methyl tert butyl ether	1.587	1.7010	0.010	AVRG	7.2

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: UX34 Project: LANDSBURG

Instrument ID: NT2 Cont. Calib. Date: 06/15/12

Init. Calib. Date: 06/12/12 Cont. Calib. Time: 0901

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.540	0.5330	0.010	AVRG	-1.3
d8-Toluene	1.192	1.2311	0.010	AVRG	3.3
4-Bromofluorobenzene	0.516	0.5164	0.010	AVRG	0.1
d4-1,2-Dichlorobenzene	0.908	0.9351	0.010	AVRG	3.0
Dibromofluoromethane	0.521	0.5544	0.010	AVRG	6.4

<- Exceeds QC limit of 20% D
* RF less than minimum RF

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: UX34 | Project: LANDSBURG

Ical Midpoint ID: 0100612 | Ical Date: 06/12/12

Instrument ID: NT2 | Project Run Date: 06/15/12

		IS1(PFB) AREA	#	RT	#	IS2(DFB) AREA	#	RT	#	IS3(CLB) AREA	#	RT	#
	ICAL MIDPT	261822		5.45		396657		5.84		349890		7.92	
	UPPER LIMIT	523644		5.95		793314		6.34		699780		8.42	
	LOWER LIMIT	130911		4.95		198328		5.34		174945		7.42	
	Sample ID												
01	LCS0615	231343		5.45		339206		5.84		317093		7.92	
02	LCS0615	225411		5.45		335965		5.84		314876		7.92	
03	MB0615	209164		5.45		333543		5.84		297694		7.92	
04	LMW-11-0612	222002		5.45		356479		5.84		320269		7.92	
05	LMW-9-0612	200813		5.45		310471		5.85		278245		7.92	
06	LMW-10-0612	202572		5.45		324175		5.85		294063		7.92	
07	TRIP BLANKS	198450		5.45		321719		5.84		289827		7.92	
08	TRIP BLANK	203325		5.45		335374		5.85		300268		7.92	
09	LMW-5-0612	208373		5.45		341772		5.85		311362		7.92	
10	LMW-3-0612	188190		5.45		296241		5.85		266341		7.92	
11	LMW-EB-0612	184747		5.45		295087		5.85		269055		7.92	
12	LMW-8-0612	181742		5.45		299941		5.84		271822		7.92	
13	LMW-6-0612	199107		5.45		330781		5.85		301947		7.92	
14	LMW-4-0612	183279		5.45		289875		5.84		263702		7.92	
15	LMW-7-0612	184341		5.45		300569		5.85		277630		7.92	
16	LMW-7-0612-D	180108		5.45		281881		5.84		256616		7.92	
17	LMW-2-0612	192239		5.45		321218		5.85		298561		7.92	
18	TRIP BLANK	174823		5.45		277182		5.85		255261		7.92	
19													
20													
21													
22													

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: UX34 Project: LANDSBURG

Ical Midpoint ID: 0100612 Ical Date: 06/12/12

Instrument ID: NT2 Project Run Date: 06/15/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	227035	9.62				
	UPPER LIMIT	454070	10.12				
	LOWER LIMIT	113518	9.12				
	Sample ID						
01	LCS0615	214725	9.62				
02	LCS0615	211864	9.62				
03	MB0615	188007	9.62				
04	LMW-11-0612	194507	9.62				
05	LMW-9-0612	181612	9.62				
06	LMW-10-0612	184022	9.62				
07	TRIP BLANKS	181956	9.62				
08	TRIP BLANK	183367	9.62				
09	LMW-5-0612	187575	9.62				
10	LMW-3-0612	173199	9.62				
11	LMW-EB-0612	173191	9.62				
12	LMW-8-0612	176596	9.62				
13	LMW-6-0612	183736	9.62				
14	LMW-4-0612	173897	9.62				
15	LMW-7-0612	176019	9.62				
16	LMW-7-0612-D	172995	9.62				
17	LMW-2-0612	180735	9.62				
18	TRIP BLANK	169107	9.62				
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

HCID Analysis
Report and Summary QC Forms

ARI Job ID: UX34, UX48, UX61, UX62

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Extraction Method: SW3510C

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

Matrix: Water

Data Release Authorized:
Reported: 06/11/12

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-060812	Method Blank	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10310					Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	87.4%
UX34A	LMW-11-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10310	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	85.4%
UX34B	LMW-9-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10311	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	87.7%
UX34C	LMW-10-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10312	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	87.1%

Reported in mg/L (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273

Client ID	O-TER	TOT OUT
MB-060812	87.4%	0
LCS-060812	89.7%	0
LCSD-060812	92.8%	0
LMW-11-0612	85.4%	0
LMW-9-0612	87.7%	0
LMW-10-0612	87.1%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(55-110)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-10310 to 12-10312

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1

Sample ID: LCS-060812
LCS/LCSD

Lab Sample ID: LCS-060812
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized:
Reported: 06/11/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Date Extracted LCS/LCSD: 06/08/12

Date Analyzed LCS: 06/09/12 13:39
LCSD: 06/09/12 13:58
Instrument/Analyst LCS: FID/MH
LCSD: FID/MH

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.44	3.00	81.3%	2.38	3.00	79.3%	2.5%

HCID Surrogate Recovery

	LCS	LCSD
o-Terphenyl	89.7%	92.8%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

FORM III

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

Client ID	O-TER	TOT OUT
MB-060812	87.4%	0
LCS-060812	89.7%	0
LCSD-060812	92.8%	0
LMW-5-0612	88.6%	0
LMW-3-0612	83.1%	0
LMW-EB-0612	84.0%	0
LMW-8-0612	86.3%	0
LMW-6-0612	90.3%	0
LMW-4-0612	78.3%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(55-110)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-10316 to 12-10321

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Extraction Method: SW3510C

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273

Matrix: Water

Data Release Authorized:
Reported: 06/11/12

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-060812	Method Blank	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10316					Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	87.4%
UX48B	LMW-5-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10316	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	88.6%
UX48C	LMW-3-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10317	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	83.1%
UX48D	LMW-EB-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10318	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	84.0%
UX48E	LMW-8-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10319	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	86.3%
UX48F	LMW-6-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10320	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	90.3%
UX48G	LMW-4-0612	06/08/12	06/09/12	1.0	Gas	< 0.25 U
12-10321	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	78.3%

Reported in mg/L (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1

Sample ID: LCS-060812
LCS/LCSD

Lab Sample ID: LCS-060812
LIMS ID: 12-10316
Matrix: Water
Data Release Authorized:
Reported: 06/11/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Date Extracted LCS/LCSD: 06/08/12

Date Analyzed LCS: 06/09/12 13:39
LCSD: 06/09/12 13:58
Instrument/Analyst LCS: FID/MH
LCSD: FID/MH

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.44	3.00	81.3%	2.38	3.00	79.3%	2.5%

HCID Surrogate Recovery

	LCS	LCSD
o-Terphenyl	89.7%	92.8%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

FORM III

4

TPH METHOD BLANK SUMMARY

BLANK NO.

UX34MBW1

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

SDG No.: UX34-UX48 Project No.: LANDSBURG

Date Extracted: 06/08/12 Matrix: LIQUID

Date Analyzed : 06/09/12 Instrument ID : FID3B

Time Analyzed : 1319

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UX34LCSW1	UX34LCSW1	06/09/12
02	UX34LCSDW1	UX34LCSDW1	06/09/12
03	LMW-11-0612	UX34A	06/09/12
04	LMW-9-0612	UX34B	06/09/12
05	LMW-10-0612	UX34C	06/09/12
06	LMW-5-0612	UX48B	06/09/12
07	LMW-3-0612	UX48C	06/09/12
08	LMW-EB-0612	UX48D	06/09/12
09	LMW-8-0612	UX48E	06/09/12
10	LMW-6-0612	UX48F	06/09/12
11	LMW-4-0612	UX48G	06/09/12
12			
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FORM IV TPH

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

SDG No.: UX34-UX48 Project: LANDSBURG

Instrument ID: FID3B GC Column: RTX-1

Run Date: 06/11/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.57 TRIAC: 7.40

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	ZZZZZ	ZZZZZ	06/09/12	0850	5.57	7.40
02	RT	RT	06/09/12	0908	5.57	7.40
03	IB	IB	06/09/12	0927	5.57	7.40
04	ZZZZZ	ZZZZZ	06/09/12	0946	5.57	7.40
05	ZZZZZ	ZZZZZ	06/09/12	1005	5.57	7.40
06	ZZZZZ	ZZZZZ	06/09/12	1024	5.57	7.40
07	ZZZZZ	ZZZZZ	06/09/12	1044	5.57	7.39
08	ZZZZZ	ZZZZZ	06/09/12	1103	5.57	7.40
09	ZZZZZ	ZZZZZ	06/09/12	1123		
10	ZZZZZ	ZZZZZ	06/09/12	1142	5.57	7.39
11	ZZZZZ	ZZZZZ	06/09/12	1202	5.57	7.40
12	ZZZZZ	ZZZZZ	06/09/12	1221	5.57	7.40
13	ZZZZZ	ZZZZZ	06/09/12	1241	5.57	7.40
14	ZZZZZ	ZZZZZ	06/09/12	1300	5.58	7.40
15	UX34MBW1	UX34MBW1	06/09/12	1319	5.57	7.40
16	UX34LCSW1	UX34LCSW1	06/09/12	1339	5.57	7.40
17	UX34LCSDW1	UX34LCSDW1	06/09/12	1358	5.58	7.40
18	LMW-11-0612	UX34A	06/09/12	1418	5.57	7.40
19	LMW-9-0612	UX34B	06/09/12	1437	5.57	7.40
20	LMW-10-0612	UX34C	06/09/12	1456	5.57	7.40
21	LMW-5-0612	UX48B	06/09/12	1516	5.57	7.40
22	LMW-3-0612	UX48C	06/09/12	1535	5.57	7.40
23	LMW-EB-0612	UX48D	06/09/12	1554	5.57	7.40
24	ZZZZZ	ZZZZZ	06/09/12	1614	5.57	7.39
25	ZZZZZ	ZZZZZ	06/09/12	1632	5.58	7.40
26	LMW-8-0612	UX48E	06/09/12	1652	5.57	7.40
27	LMW-6-0612	UX48F	06/09/12	1711	5.57	7.40
28	LMW-4-0612	UX48G	06/09/12	1730	5.57	7.40
29	ZZZZZ	ZZZZZ	06/09/12	1749	5.58	7.41
30	ZZZZZ	ZZZZZ	06/09/12	1808	5.57	7.40
31	ZZZZZ	ZZZZZ	06/09/12	1826	5.57	7.40
32	ZZZZZ	ZZZZZ	06/09/12	1845	5.57	7.40

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

SDG No.: UX34-UX48 Project: LANDSBURG

Instrument ID: FID3B GC Column: RTX-1

Run Date: 06/11/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.57 TRIAC: 7.40

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	ZZZZZ	ZZZZZ	06/09/12	1904	5.57	7.40
02	ZZZZZ	ZZZZZ	06/09/12	1922	5.57	7.39
03	ZZZZZ	ZZZZZ	06/09/12	1941	5.57	7.40
04	ZZZZZ	ZZZZZ	06/09/12	1959	5.57	7.40
05	ZZZZZ	ZZZZZ	06/09/12	2018	5.57	7.39
06	ZZZZZ	ZZZZZ	06/09/12	2037	5.57	7.39
07	ZZZZZ	ZZZZZ	06/09/12	2056	5.57	7.40
08	ZZZZZ	ZZZZZ	06/09/12	2115	5.57	7.39
09	ZZZZZ	ZZZZZ	06/09/12	2134	5.58	7.39
10	ZZZZZ	ZZZZZ	06/09/12	2153	5.57	7.40

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

Metals Analysis
Report and Summary QC Forms

ARI Job ID: UX34, UX48, UX61, UX62

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-11-0612	UX34A	12-10310	
LMW-11-0612D	UX34ADUP	12-10310	
LMW-11-0612S	UX34ASPK	12-10310	
LMW-9-0612	UX34B	12-10311	
PBW	UX34MB1	12-10311	
LCSW	UX34MB1SPK	12-10311	
LMW-10-0612	UX34C	12-10312	
LMW-5-0612	UX48B	12-10316	
LMW-3-0612	UX48C	12-10317	
LMW-EB-0612	UX48D	12-10318	
LMW-8-0612	UX48E	12-10319	
LMW-6-0612	UX48F	12-10320	
LMW-4-0612	UX48G	12-10321	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 6/18/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-11-0612
SAMPLE

Lab Sample ID: UX34A
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	**7440-38-2**	**Arsenic**	0.048	0.2	**11.1**	
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**328**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**57,600**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	**7439-89-6**	**Iron**	7.5	50	**2,420**	
200.8	06/11/12	200.8	06/15/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**29,300**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**132**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**1,910**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**27,600**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-11-0612
DUPLICATE

Lab Sample ID: UX34A
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010C	50 U	50 U	0.0%	+/- 50	L
Antimony	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Arsenic	200.8	11.1	10.7	3.7%	+/- 20%	
Barium	6010C	328	318	3.1%	+/- 20%	
Beryllium	6010C	1 U	1 U	0.0%	+/- 1	L
Cadmium	6010C	2 U	2 U	0.0%	+/- 2	L
Calcium	6010C	57,600	57,000	1.0%	+/- 20%	
Chromium	6010C	5 U	5 U	0.0%	+/- 5	L
Cobalt	6010C	3 U	3 U	0.0%	+/- 3	L
Copper	6010C	2 U	2 U	0.0%	+/- 2	L
Iron	6010C	2,420	2,360	2.5%	+/- 20%	
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Magnesium	6010C	29,300	28,400	3.1%	+/- 20%	
Manganese	6010C	132	128	3.1%	+/- 20%	
Nickel	6010C	10 U	10 U	0.0%	+/- 10	L
Potassium	6010C	1,910	1,790	6.5%	+/- 500	L
Selenium	200.8	0.5 U	0.5 U	0.0%	+/- 0.5	L
Silver	6010C	3 U	3 U	0.0%	+/- 3	L
Sodium	6010C	27,600	26,500	4.1%	+/- 20%	
Thallium	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Vanadium	6010C	3 U	3 U	0.0%	+/- 3	L
Zinc	6010C	10 U	10 U	0.0%	+/- 10	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-11-0612
MATRIX SPIKE

Lab Sample ID: UX34A
LIMS ID: 12-10310
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010C	50.0 U	2,050	2,000	102%	
Antimony	200.8	0.200 U	25.4	25.0	102%	
Arsenic	200.8	11.1	37.8	25.0	107%	
Barium	6010C	328	2,350	2,000	101%	
Beryllium	6010C	1.00 U	503	500	101%	
Cadmium	6010C	2.00 U	520	500	104%	
Calcium	6010C	57,600	68,700	10,000	111%	H
Chromium	6010C	5.00 U	521	500	104%	
Cobalt	6010C	3.00 U	498	500	99.6%	
Copper	6010C	2.00 U	529	500	106%	
Iron	6010C	2,420	4,450	2,000	102%	
Lead	200.8	0.100 U	24.7	25.0	98.8%	
Magnesium	6010C	29,300	38,300	10,000	90.0%	
Manganese	6010C	132	630	500	99.6%	
Nickel	6010C	10.0 U	512	500	102%	
Potassium	6010C	1,910	12,400	10,000	105%	
Selenium	200.8	0.500 U	77.8	80.0	97.2%	
Silver	6010C	3.00 U	525	500	105%	
Sodium	6010C	27,600	39,200	10,000	116%	
Thallium	200.8	0.200 U	24.0	25.0	96.0%	
Vanadium	6010C	3.00 U	512	500	102%	
Zinc	6010C	10.0 U	500	500	100%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-9-0612
SAMPLE

Lab Sample ID: UX34B
LIMS ID: 12-10311
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	**7440-38-2**	**Arsenic**	0.048	0.2	**0.4**	
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**322**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**89,900**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	**7439-89-6**	**Iron**	7.5	50	**1,700**	
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**49,600**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**180**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**2,470**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**17,000**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-10-0612
SAMPLE

Lab Sample ID: UX34C
LIMS ID: 12-10312
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	**7440-38-2**	**Arsenic**	0.048	0.2	**0.3**	
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**35**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**7,070**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	7439-89-6	Iron	7.5	50	50	U
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**3,120**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**7**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**1,230**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**83,500**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: METHOD BLANK

Lab Sample ID: UX34MB
LIMS ID: 12-10311
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-39-3	Barium	1.33	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	7440-70-2	Calcium	11.3	50	50	U
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	7439-89-6	Iron	7.5	50	50	U
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	06/11/12	6010C	06/13/12	7439-96-5	Manganese	0.28	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	7440-09-7	Potassium	65.7	500	500	U
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-23-5	Sodium	11.4	500	500	U
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS

Sample ID: LAB CONTROL

Lab Sample ID: UX34LCS
LIMS ID: 12-10311
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX34-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2010	2000	100%	
Antimony	200.8	25.5	25.0	102%	
Arsenic	200.8	27.0	25.0	108%	
Barium	6010C	2030	2000	102%	
Beryllium	6010C	494	500	98.8%	
Cadmium	6010C	514	500	103%	
Calcium	6010C	9920	10000	99.2%	
Chromium	6010C	520	500	104%	
Cobalt	6010C	500	500	100%	
Copper	6010C	514	500	103%	
Iron	6010C	2040	2000	102%	
Lead	200.8	26.1	25.0	104%	
Magnesium	6010C	10200	10000	102%	
Manganese	6010C	492	500	98.4%	
Nickel	6010C	516	500	103%	
Potassium	6010C	8890	10000	88.9%	
Selenium	200.8	79.8	80.0	99.8%	
Silver	6010C	516	500	103%	
Sodium	6010C	9660	10000	96.6%	
Thallium	200.8	24.7	25.0	98.8%	
Vanadium	6010C	508	500	102%	
Zinc	6010C	502	500	100%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-5-0612
SAMPLE

Lab Sample ID: UX48B
LIMS ID: 12-10316
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	**7429-90-5**	**Aluminum**	7.6	50	**70**	
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	**7440-38-2**	**Arsenic**	0.048	0.2	**0.7**	
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**279**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**100,000**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	**7439-89-6**	**Iron**	7.5	50	**340**	
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**56,500**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**269**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**2,670**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**17,000**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-3-0612
SAMPLE

Lab Sample ID: UX48C
LIMS ID: 12-10317
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**72**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**37,900**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	7439-89-6	Iron	7.5	50	50	U
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**15,400**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**57**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**1,860**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**10,700**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-EB-0612
SAMPLE

Lab Sample ID: UX48D
LIMS ID: 12-10318
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-39-3	Barium	1.33	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**60**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	7439-89-6	Iron	7.5	50	50	U
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	06/11/12	6010C	06/13/12	7439-96-5	Manganese	0.28	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	7440-09-7	Potassium	65.7	500	500	U
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-23-5	Sodium	11.4	500	500	U
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-8-0612
SAMPLE

Lab Sample ID: UX48E
LIMS ID: 12-10319
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	**7429-90-5**	**Aluminum**	7.6	50	**60**	
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	**7440-38-2**	**Arsenic**	0.048	0.2	**4.9**	
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**79**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**70,200**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	**7439-89-6**	**Iron**	7.5	50	**33,900**	
200.8	06/11/12	200.8	06/14/12	**7439-92-1**	**Lead**	0.046	0.1	**0.1**	
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**38,100**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**383**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**2,270**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**13,800**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-6-0612
SAMPLE

Lab Sample ID: UX48F
LIMS ID: 12-10320
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**112**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**26,800**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	**7439-89-6**	**Iron**	7.5	50	**2,140**	
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**13,200**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**30**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**650**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**6,650**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-4-0612
SAMPLE

Lab Sample ID: UX48G
LIMS ID: 12-10321
Matrix: Water
Data Release Authorized:
Reported: 06/18/12

QC Report No: UX48-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/06/12
Date Received: 06/06/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/11/12	6010C	06/13/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/11/12	200.8	06/14/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/11/12	200.8	06/14/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	**7440-39-3**	**Barium**	1.33	3	**352**	
3010A	06/11/12	6010C	06/13/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/11/12	6010C	06/13/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/11/12	6010C	06/13/12	**7440-70-2**	**Calcium**	11.3	50	**117,000**	
3010A	06/11/12	6010C	06/13/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/11/12	6010C	06/13/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/11/12	6010C	06/13/12	**7439-89-6**	**Iron**	7.5	50	**920**	
200.8	06/11/12	200.8	06/14/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/11/12	6010C	06/13/12	**7439-95-4**	**Magnesium**	9.6	50	**70,600**	
3010A	06/11/12	6010C	06/13/12	**7439-96-5**	**Manganese**	0.28	1	**162**	
3010A	06/11/12	6010C	06/13/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/11/12	6010C	06/13/12	**7440-09-7**	**Potassium**	65.7	500	**3,970**	
200.8	06/11/12	200.8	06/14/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/11/12	6010C	06/13/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/11/12	6010C	06/13/12	**7440-23-5**	**Sodium**	11.4	500	**32,100**	
200.8	06/11/12	200.8	06/14/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/11/12	6010C	06/13/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/11/12	6010C	06/13/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Aluminum	AL	ICP	IP061371	2000.0	2046.46	**102.3**	2000.0	2090.52	**104.5**	2011.63	**100.6**	2015.68	**100.8**	2015.80	**100.8**	2027.80	**101.4**
Antimony	SB	PMS	MS061411	50.0	51.23	**102.5**	50.0	48.66	**97.3**	49.07	**98.1**	50.07	**100.1**	49.45	**98.9**	49.56	**99.1**
Arsenic	AS	PMS	MS061411	50.0	51.68	**103.4**	50.0	50.49	**101.0**	51.28	**102.6**	50.29	**100.6**	50.54	**101.1**	50.59	**101.2**
Barium	BA	ICP	IP061371	1000.0	1010.21	**101.0**	1000.0	1001.57	**100.2**	1006.73	**100.7**	1002.69	**100.3**	1001.46	**100.1**	1003.89	**100.4**
Beryllium	BE	ICP	IP061371	1000.0	983.69	**98.4**	1000.0	1000.15	**100.0**	995.27	**99.5**	995.24	**99.5**	992.95	**99.3**	998.33	**99.8**
Cadmium	CD	ICP	IP061371	1000.0	1018.26	**101.8**	1000.0	1021.45	**102.1**	1016.37	**101.6**	1019.17	**101.9**	1040.40	**104.0**	1034.94	**103.5**
Calcium	CA	ICP	IP061371	2000.0	2064.24	**103.2**	2000.0	2062.13	**103.1**	2061.83	**103.1**	2066.88	**103.3**	2075.47	**103.8**	2087.39	**104.4**
Chromium	CR	ICP	IP061371	1000.0	1015.76	**101.6**	1000.0	1011.87	**101.2**	1015.35	**101.5**	1009.48	**100.9**	1013.63	**101.4**	1016.26	**101.6**
Cobalt	CO	ICP	IP061371	1000.0	990.74	**99.1**	1000.0	991.55	**99.2**	988.32	**98.8**	991.85	**99.2**	1009.85	**101.0**	1006.30	**100.6**
Copper	CU	ICP	IP061371	1000.0	1011.51	**101.2**	1000.0	1011.02	**101.1**	1011.68	**101.2**	1013.23	**101.3**	1054.29	**105.4**	1048.80	**104.9**
Iron	FE	ICP	IP061371	2000.0	2057.01	**102.9**	2000.0	2059.52	**103.0**	2047.71	**102.4**	2051.30	**102.6**	2043.03	**102.2**	2051.95	**102.6**
Lead	PB	PMS	MS061411	50.0	49.43	**98.9**	50.0	47.75	**95.5**	47.93	**95.9**	48.12	**96.2**	48.58	**97.2**	49.26	**98.5**
Magnesium	MG	ICP	IP061371	2000.0	2014.06	**100.7**	2000.0	2041.98	**102.1**	2009.40	**100.5**	2000.16	**100.0**	1989.58	**99.5**	2002.47	**100.1**
Manganese	MN	ICP	IP061371	1000.0	1006.72	**100.7**	1000.0	1005.47	**100.5**	1000.48	**100.0**	996.99	**99.7**	992.23	**99.2**	995.44	**99.5**
Nickel	NI	ICP	IP061371	1000.0	1009.88	**101.0**	1000.0	996.61	**99.7**	1018.48	**101.8**	1015.28	**101.5**	1014.29	**101.4**	1020.87	**102.1**
Potassium	K	ICP	IP061371	20000.0	19364.22	**96.8**	20000.0	23974.26	**119.9**	19608.59	**98.0**	19606.44	**98.0**	19639.35	**98.2**	19781.56	**98.9**
Selenium	SE	PMS	MS061411	80.0	81.32	**101.7**	50.0	52.47	**104.9**	53.72	**107.4**	52.50	**105.0**	51.09	**102.2**	51.88	**103.8**
Silver	AG	ICP	IP061371	1000.0	991.75	**99.2**	1000.0	991.65	**99.2**	995.21	**99.5**	995.74	**99.6**	1037.83	**103.8**	1032.09	**103.2**
Sodium	NA	ICP	IP061371	50000.0	52303.62	**104.6**	50000.0	52445.21	**104.9**	51145.33	**102.3**	50840.69	**101.7**	51417.57	**102.8**	51970.26	**103.9**
Thallium	TL	PMS	MS061411	50.0	47.68	**95.4**	50.0	46.28	**92.6**	46.04	**92.1**	46.21	**92.4**	47.06	**94.1**	47.68	**95.4**
Vanadium	V	ICP	IP061371	1000.0	988.54	**98.9**	1000.0	990.02	**99.0**	988.20	**98.8**	990.35	**99.0**	1027.20	**102.7**	1021.07	**102.1**
Zinc	ZN	ICP	IP061371	1000.0	1042.10	**104.2**	1000.0	1025.33	**102.5**	1045.68	**104.6**	1043.50	**104.4**	1042.60	**104.3**	1045.43	**104.5**

UX34-00101

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Aluminum	AL	ICP	IP061371	2000.0	2054.38	**102.7**	1952.76	**97.6**	2007.23	**100.4**						
Antimony	SB	PMS	MS061411	50.0	50.43	**100.9**										
Arsenic	AS	PMS	MS061411	50.0	51.72	**103.4**										
Barium	BA	ICP	IP061371	1000.0	999.98	**100.0**	988.76	**98.9**	990.22	**99.0**						
Beryllium	BE	ICP	IP061371	1000.0	995.44	**99.5**	986.94	**98.7**	980.79	**98.1**						
Cadmium	CD	ICP	IP061371	1000.0	1020.22	**102.0**	1012.68	**101.3**	1016.06	**101.6**						
Calcium	CA	ICP	IP061371	2000.0	2103.65	**105.2**	2057.01	**102.9**	2074.50	**103.7**						
Chromium	CR	ICP	IP061371	1000.0	1016.49	**101.6**	1006.23	**100.6**	1006.62	**100.7**						
Cobalt	CO	ICP	IP061371	1000.0	996.83	**99.7**	989.58	**99.0**	991.69	**99.2**						
Copper	CU	ICP	IP061371	1000.0	1017.79	**101.8**	1009.22	**100.9**	1011.27	**101.1**						
Iron	FE	ICP	IP061371	2000.0	2079.49	**104.0**	2011.47	**100.6**	2041.88	**102.1**						
Lead	PB	PMS	MS061411	50.0	49.02	**98.0**										
Magnesium	MG	ICP	IP061371	2000.0	2031.73	**101.6**	1962.03	**98.1**	1976.42	**98.8**						
Manganese	MN	ICP	IP061371	1000.0	989.02	**98.9**	978.97	**97.9**	977.15	**97.7**						
Nickel	NI	ICP	IP061371	1000.0	1016.05	**101.6**	1005.22	**100.5**	998.94	**99.9**						
Potassium	K	ICP	IP061371	20000.0	19792.86	**99.0**	19690.28	**98.5**	19609.93	**98.0**						
Selenium	SE	PMS	MS061411	50.0	53.03	**106.1**										
Silver	AG	ICP	IP061371	1000.0	991.49	**99.1**	984.44	**98.4**	988.68	**98.9**						
Sodium	NA	ICP	IP061371	50000.0	51516.30	**103.0**	50701.63	**101.4**	50166.56	**100.3**						
Thallium	TL	PMS	MS061411	50.0	47.90	**95.8**										
Vanadium	V	ICP	IP061371	1000.0	992.57	**99.3**	988.50	**98.9**	988.09	**98.8**						
Zinc	ZN	ICP	IP061371	1000.0	1041.05	**104.1**	1031.69	**103.2**	1036.45	**103.6**						

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Lead	PB	PMS	MS061511	50.0	51.33	**102.7**	50.0	49.77	**99.5**	50.15	**100.3**	50.99	**102.0**				

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

UNITS: ug/L

SDG: UX34

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Aluminum	AL	ICP	IP061371	50.0	65.27	**130.5**	50.00	**100.0**								
Antimony	SB	PMS	MS061411	0.2	0.23	**115.0**										
Arsenic	AS	PMS	MS061411	0.2	0.19	**95.0**										
Barium	BA	ICP	IP061371	3.0	2.51	**83.7**	1.71	**57.0**								
Beryllium	BE	ICP	IP061371	1.0	1.02	**102.0**	0.90	**90.0**								
Cadmium	CD	ICP	IP061371	2.0	2.22	**111.0**	2.06	**103.0**								
Calcium	CA	ICP	IP061371	50.0	49.89	**99.8**	47.88	**95.8**								
Chromium	CR	ICP	IP061371	5.0	6.00	**120.0**	5.01	**100.2**								
Cobalt	CO	ICP	IP061371	3.0	3.55	**118.3**	3.52	**117.3**								
Copper	CU	ICP	IP061371	2.0	2.38	**119.0**	2.01	**100.5**								
Iron	FE	ICP	IP061371	50.0	56.68	**113.4**	50.61	**101.2**								
Lead	PB	PMS	MS061411	0.1	0.11	**110.0**										
Magnesium	MG	ICP	IP061371	50.0	53.60	**107.2**	45.83	**91.7**								
Manganese	MN	ICP	IP061371	1.0	0.90	**90.0**	0.79	**79.0**								
Nickel	NI	ICP	IP061371	10.0	12.54	**125.4**	11.41	**114.1**								
Potassium	K	ICP	IP061371	500.0	400.98	**80.2**	399.92	**80.0**								
Selenium	SE	PMS	MS061411	0.5	0.51	**102.0**										
Silver	AG	ICP	IP061371	3.0	3.16	**105.3**	3.07	**102.3**								
Sodium	NA	ICP	IP061371	500.0	465.26	**93.1**	447.86	**89.6**								
Thallium	TL	PMS	MS061411	0.2	0.20	**100.0**										
Vanadium	V	ICP	IP061371	3.0	2.82	**94.0**	3.16	**105.3**								
Zinc	ZN	ICP	IP061371	10.0	8.90	**89.0**	10.91	**109.1**								
Lead	PB	PMS	MS061511	0.1	0.11	**110.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Aluminum	AL	ICP	IP061371	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Antimony	SB	PMS	MS061411	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS061411	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Barium	BA	ICP	IP061371	200.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Beryllium	BE	ICP	IP061371	5.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	CD	ICP	IP061371	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Calcium	CA	ICP	IP061371	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Chromium	CR	ICP	IP061371	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Cobalt	CO	ICP	IP061371	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Copper	CU	ICP	IP061371	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Iron	FE	ICP	IP061371	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Lead	PB	PMS	MS061411	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Magnesium	MG	ICP	IP061371	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Manganese	MN	ICP	IP061371	15.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Nickel	NI	ICP	IP061371	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Potassium	K	ICP	IP061371	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Selenium	SE	PMS	MS061411	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	ICP	IP061371	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Sodium	NA	ICP	IP061371	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Thallium	TL	PMS	MS061411	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Vanadium	V	ICP	IP061371	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP061371	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Aluminum	AL	ICP	IP061371	200.0	50.0	50.0	U	50.0	U	50.0	U						
Antimony	SB	PMS	MS061411	60.0	0.2	0.2	U										
Arsenic	AS	PMS	MS061411	10.0	0.2	0.2	U										
Barium	BA	ICP	IP061371	200.0	3.0	3.0	U	3.0	U	3.0	U						
Beryllium	BE	ICP	IP061371	5.0	1.0	1.0	U	1.0	U	1.0	U						
Cadmium	CD	ICP	IP061371	5.0	2.0	2.0	U	2.0	U	2.0	U						
Calcium	CA	ICP	IP061371	5000.0	50.0	50.0	U	50.0	U	50.0	U						
Chromium	CR	ICP	IP061371	10.0	5.0	5.0	U	5.0	U	5.0	U						
Cobalt	CO	ICP	IP061371	50.0	3.0	3.0	U	3.0	U	3.0	U						
Copper	CU	ICP	IP061371	25.0	2.0	2.0	U	2.0	U	2.0	U						
Iron	FE	ICP	IP061371	100.0	50.0	50.0	U	50.0	U	50.0	U						
Lead	PB	PMS	MS061411	3.0	0.1	0.1	U										
Magnesium	MG	ICP	IP061371	5000.0	50.0	50.0	U	50.0	U	50.0	U						
Manganese	MN	ICP	IP061371	15.0	1.0	1.0	U	1.0	U	1.0	U						
Nickel	NI	ICP	IP061371	40.0	10.0	10.0	U	10.0	U	10.0	U						
Potassium	K	ICP	IP061371	5000.0	500.0	500.0	U	500.0	U	500.0	U						
Selenium	SE	PMS	MS061411	5.0	0.5	0.5	U										
Silver	AG	ICP	IP061371	10.0	3.0	3.0	U	3.0	U	3.0	U						
Sodium	NA	ICP	IP061371	5000.0	500.0	500.0	U	500.0	U	500.0	U						
Thallium	TL	PMS	MS061411	10.0	0.2	0.2	U										
Vanadium	V	ICP	IP061371	50.0	3.0	3.0	U	3.0	U	3.0	U						
Zinc	ZN	ICP	IP061371	20.0	10.0	10.0	U	10.0	U	10.0	U						

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Lead	PB	PMS	MS061511	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U				

UX34 : 00107

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg

RUNID: IP061371

SDG: UX34

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	201351.2	200808.0	**100.4**	198928.0	201534.6	**100.8**			
Antimony		1000	28.0	1054.5	**105.5**	29.1	1044.7	**104.5**			
Arsenic		1000	7.3	1017.3	**101.7**	9.3	1006.1	**100.6**			
Barium		1000	3.3	1002.6	**100.3**	3.8	1002.7	**100.3**			
Beryllium		1000	0.0	1010.3	**101.0**	0.0	1000.4	**100.0**			
Boron			-1.8	2.7		-0.5	1.9				
Cadmium		1000	1.0	1025.5	**102.6**	0.9	1014.1	**101.4**			
Calcium	100000	100000	101371.9	101686.8	**101.7**	101571.9	101108.8	**101.1**			
Chromium		1000	-1.5	1015.3	**101.5**	-2.5	1008.0	**100.8**			
Cobalt		1000	1.9	964.6	**96.5**	2.1	959.9	**96.0**			
Copper		1000	-0.6	1047.7	**104.8**	-1.1	1046.6	**104.7**			
Iron	200000	200000	198976.1	198101.6	**99.1**	195444.0	197781.3	**98.9**			
Lead		1000	-8.2	973.6	**97.4**	-9.1	965.6	**96.6**			
Magnesium	100000	100000	103103.5	98580.2	**98.6**	103344.8	98514.7	**98.5**			
Manganese		1000	0.1	988.7	**98.9**	0.2	983.4	**98.3**			
Molybdenum			1.4	1.6		1.4	1.2				
Nickel		1000	-2.6	994.1	**99.4**	-5.5	981.5	**98.2**			
Potassium			-89.5	-106.6		-83.0	-112.9				
Selenium		1000	21.6	1016.5	**101.7**	20.0	1000.1	**100.0**			
Silicon			-3.9	-2.8		-11.8	-17.4				
Silver		1000	-0.5	1016.3	**101.6**	-0.4	1002.0	**100.2**			
Sodium			12.7	20.2		8.9	8.0				
Strontium			4.0	4.0		4.0	3.9				
Thallium		1000	-5.6	950.1	**95.0**	-4.4	938.6	**93.9**			
Tin			-0.1	0.3		-0.6	-0.2				
Titanium			4.9	5.4		3.3	4.5				
Vanadium		1000	0.3	964.6	**96.5**	0.4	957.5	**95.8**			
Zinc		1000	2.3	984.5	**98.5**	2.3	988.8	**98.9**			

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

ICS SOURCE: I.V.

RUNID: MS061411

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Antimony			0.1	0.1							
Arsenic		20	0.0	19.0	**95.0**						
Cadmium		20	0.1	19.3	**96.5**						
Copper		20	0.8	20.4	**102.0**						
Nickel		20	0.3	20.0	**100.0**						
Selenium			-0.4	-0.4							
Silver		20	0.0	19.5	**97.5**						
Thorium			0.3	0.1							
Zinc		20	0.7	19.6	**98.0**						

UX34 : 061109

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg

RUNID: MS061511

SDG: UX34

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	20000	20000	21049.1	21893.6	**109.5**						
Antimony			0.1	0.1							
Arsenic		20	0.0	17.1	**85.5**						
Cadmium		20	0.2	19.4	**97.0**						
Calcium	20000	20000	20508.3	20300.9	**101.5**						
Chromium		20	0.8	19.9	**99.5**						
Cobalt		20	0.0	19.0	**95.0**						
Copper		20	0.9	20.5	**102.5**						
Iron	20000	20000	20744.3	19675.1	**98.4**						
Magnesium	20000	20000	21400.5	22064.4	**110.3**						
Manganese		20	0.1	19.2	**96.0**						
Molybdenum	400	400	423.2	419.2	**104.8**						
Nickel		20	0.3	20.5	**102.5**						
Potassium	20000	20000	0.0	25224.9	**126.1**						
Selenium			-0.3	-0.2							
Silver		20	0.0	18.9	**94.5**						
Sodium	20000	20000	21980.5	22713.6	**113.6**						
Thorium			0.1	0.1							
Vanadium			0.1	0.2							
Zinc		20	0.7	19.8	**99.0**						

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

ANALYSIS METHOD: ICP

SDG: UX34

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Aluminum	LMW-11-0612L	UX34A-L	Water	IP061371	50.00	U	250.00	U		
Barium	LMW-11-0612L	UX34A-L	Water	IP061371	327.57		323.45	B	1.3	
Beryllium	LMW-11-0612L	UX34A-L	Water	IP061371	1.00	U	5.00	U		
Cadmium	LMW-11-0612L	UX34A-L	Water	IP061371	2.00	U	10.00	U		
Calcium	LMW-11-0612L	UX34A-L	Water	IP061371	57615.79		57910.85		0.5	
Chromium	LMW-11-0612L	UX34A-L	Water	IP061371	5.00	U	25.00	U		
Cobalt	LMW-11-0612L	UX34A-L	Water	IP061371	3.00	U	15.00	U		
Copper	LMW-11-0612L	UX34A-L	Water	IP061371	2.00	U	10.00	U		
Iron	LMW-11-0612L	UX34A-L	Water	IP061371	2420.67		2465.30		1.8	
Magnesium	LMW-11-0612L	UX34A-L	Water	IP061371	29256.50		28029.45		4.2	
Manganese	LMW-11-0612L	UX34A-L	Water	IP061371	132.00		135.60		2.7	
Nickel	LMW-11-0612L	UX34A-L	Water	IP061371	10.00	U	50.00	U		
Potassium	LMW-11-0612L	UX34A-L	Water	IP061371	1909.68	B	2500.00	U	100.0	
Silver	LMW-11-0612L	UX34A-L	Water	IP061371	3.00	U	15.00	U		
Sodium	LMW-11-0612L	UX34A-L	Water	IP061371	27581.80		25561.35		7.3	
Vanadium	LMW-11-0612L	UX34A-L	Water	IP061371	3.00	U	15.00	U		
Zinc	LMW-11-0612L	UX34A-L	Water	IP061371	10.00	U	50.00	U		

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

ANALYSIS METHOD: PMS

SDG: UX34

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Antimony	LMW-11-0612L	UX34A-L	Water	MS061411	0.01	U	0.05	B		
Arsenic	LMW-11-0612L	UX34A-L	Water	MS061411	11.06		11.75	B	6.2	
Lead	LMW-11-0612L	UX34A-L	Water	MS061411	0.09	U	0.10	B		
Selenium	LMW-11-0612L	UX34A-L	Water	MS061411	0.07	U	0.15	B		
Thallium	LMW-11-0612L	UX34A-L	Water	MS061411	0.03	U	0.05	B		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Aluminum	AL	ICP	OPTIMA ICP 2	308.22		200	50.0	4/1/2011	250000.0	3/19/2012
Antimony	SB	PMS	NEXION 300D MS	0.00		60	0.2	4/1/2011		
Arsenic	AS	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2011		
Barium	BA	ICP	OPTIMA ICP 2	455.50		200	3.0	4/1/2011	100000.0	3/19/2012
Beryllium	BE	ICP	OPTIMA ICP 2	313.04		5	1.0	4/1/2011	5000.0	3/19/2012
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2011	20000.0	3/19/2012
Calcium	CA	ICP	OPTIMA ICP 2	317.93		5000	50.0	4/1/2011	500000.0	3/19/2012
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2011	100000.0	3/19/2012
Cobalt	CO	ICP	OPTIMA ICP 2	228.62		50	3.0	4/1/2011	80000.0	3/19/2012
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2011	40000.0	3/19/2012
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2011	250000.0	3/19/2012
Lead	PB	PMS	NEXION 300D MS	0.00		3	0.1	4/1/2011		
Magnesium	MG	ICP	OPTIMA ICP 2	279.08		5000	50.0	4/1/2011	500000.0	3/19/2012
Manganese	MN	ICP	OPTIMA ICP 2	257.61		15	1.0	4/1/2011	30000.0	3/19/2012
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2011	100000.0	3/19/2012
Potassium	K	ICP	OPTIMA ICP 2	766.49		5000	500.0	4/1/2011	500000.0	3/19/2012
Selenium	SE	PMS	NEXION 300D MS	0.00		5	0.5	4/1/2011		
Silver	AG	ICP	OPTIMA ICP 2	328.07		10	3.0	4/1/2011	5000.0	3/19/2012
Sodium	NA	ICP	OPTIMA ICP 2	589.00		5000	500.0	4/1/2011	5000000.0	3/19/2012
Thallium	TL	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2011		
Vanadium	V	ICP	OPTIMA ICP 2	292.40		50	3.0	4/1/2011	50000.0	3/19/2012
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2011	100000.0	3/19/2012

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

IEC DATE: 6/1/2012

SDG: UX34

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.2288210	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	10.2020000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0465308	0.0000000	-0.9907570	1.0929900	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1617070	0.0000000	0.0000000	0.0914952
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	3.4090200	0.0000000	0.0000000	0.0000000	0.0000000	0.1642300	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0409619	0.0000000	0.0000000	-0.0368378
Cobalt	228.62	0.0000000	0.0000000	0.2151410	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2203550	-0.0248240	0.0000000	-0.0823241
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.7214060	0.0000000	0.0000000
Lead	220.35	-0.1513300	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-2.0199800	1.2549900	0.0691628
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.2031830	0.0000000	-1.7927700	-1.2197100	0.0000000	0.8351330
Manganese	257.61	0.0055064	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0067944
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0114978	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7375200	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	4.3564800	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0691410	0.0000000	2.5520300	0.3828500	0.0000000	-0.1753480
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0309095	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0767423	0.0000000	0.0000000	0.2207060	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-4.2513600	0.0000000	0.1121590
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.4942180	0.0000000	0.0000000

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

IEC DATE: 6/1/2012

SDG: UX34

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	8.7251100	0.0000000	0.0000000	0.0000000	1.2350800	0.0000000	19.6337000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.6262000	0.0000000	-2.0479800	0.0000000
Arsenic	188.98	0.0000000	0.0000000	1.4466600	0.0000000	0.0000000	0.0000000	-6.9568100	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0777109	0.0000000	0.0000000	0.0000000	0.0000000	0.4101220	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0114175	0.0000000	0.6735850	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0576937	-0.6515750	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0358408	0.0000000	0.1461890	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.2854520	0.0267072
Cobalt	228.62	0.0000000	0.0000000	-0.2518640	0.1618730	0.0000000	0.0000000	1.6854600	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.1890580	0.0000000	0.0000000	0.0000000	0.2839350	0.0000000	0.0000000	0.0000000
Iron	273.96	0.1014670	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	5.2682800	0.0000000
Lead	220.35	0.0000000	0.0000000	-0.3516970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-3.2487800	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0040374	0.0000000	0.0000000	0.0000000	-0.3367650	0.0000000	0.0000000	0.0000000	-0.0331334	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9494270	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.9119740	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	288.16	-0.1314600	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.2105810	0.1262930	0.0000000	0.0000000	0.0000000	-0.0406459	0.0000000	-0.2398130	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	271.7310000	0.0000000	0.0000000	373.0000000
Thallium	190.80	0.0000000	0.0000000	-3.8706100	0.0000000	0.0917790	0.0000000	0.5514110	0.0000000	1.6549500	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0344764	-0.7123520	-0.4958940	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	1.3260700	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1562030	-0.7955440	0.0000000	0.0000000	0.0000000	0.6246810	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2669400	0.0000000	-0.1628880	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

UX34 : 06115

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

ANALYSIS METHOD: ICP

ARI PREP CODE: TWC

PREPDATE: 6/11/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-11-0612	UX34A	0.000	50.0	50.0
LMW-11-0612D	UX34ADUP	0.000	50.0	50.0
LMW-11-0612S	UX34ASPK	0.000	50.0	50.0
LMW-9-0612	UX34B	0.000	50.0	50.0
LMW-10-0612	UX34C	0.000	50.0	50.0
PBW	UX34MB1	0.000	50.0	50.0
LCSW	UX34MB1SPK	0.000	50.0	50.0
LMW-5-0612	UX48B	0.000	50.0	50.0
LMW-3-0612	UX48C	0.000	50.0	50.0
LMW-EB-0612	UX48D	0.000	50.0	50.0
LMW-8-0612	UX48E	0.000	50.0	50.0
LMW-6-0612	UX48F	0.000	50.0	50.0
LMW-4-0612	UX48G	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX34

ANALYSIS METHOD: PMS

ARI PREP CODE: REN

PREPDATE: 6/11/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-11-0612	UX34A	0.000	50.0	25.0
LMW-11-0612D	UX34ADUP	0.000	50.0	25.0
LMW-11-0612S	UX34ASPK	0.000	50.0	25.0
LMW-9-0612	UX34B	0.000	50.0	25.0
LMW-10-0612	UX34C	0.000	50.0	25.0
PBW	UX34MB1	0.000	50.0	25.0
LCSW	UX34MB1SPK	0.000	50.0	25.0
LMW-5-0612	UX48B	0.000	50.0	25.0
LMW-3-0612	UX48C	0.000	50.0	25.0
LMW-EB-0612	UX48D	0.000	50.0	25.0
LMW-8-0612	UX48E	0.000	50.0	25.0
LMW-6-0612	UX48F	0.000	50.0	25.0
LMW-4-0612	UX48G	0.000	50.0	25.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 6/13/2012

SDG: UX34 | RUNID: IP061371 | METHOD: ICP | END DATE: 6/13/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	10103		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S2	S2	1.00	10143						X			X	X	X	X					X												X	
S3	S3	1.00	10161		X					X													X										X
S4	S4	1.00	10182																														
S5	S5	1.00	10204			X					X					X		X	X			X											
ICV	ICV	1.00	10435		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICB	ICB	1.00	10470		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	ZZZZZZ	1.00	10510																														
ZZZZZZ	ZZZZZZ	1.00	10545																														
ZZZZZZ	ZZZZZZ	1.00	10585																														
CCV	CCV1	1.00	11021		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB1	1.00	11051		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S5	S5	1.00	11134			X					X					X		X	X			X											
S3	S3	1.00	11195		X					X													X										X
CCV	CCV2	1.00	11300		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB2	1.00	11331		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRII	1.00	11374		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAI	1.00	11414		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABI	1.00	11454		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV3	1.00	11494		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB3	1.00	11535		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	QC7M	1.00	11590																														
ZZZZZZ	HN03I7628	10.00	12043																														
ZZZZZZ	HN03I7629	10.00	12083																														
PBW	UX34MB1	1.00	12123		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-11-0612L	UX34A-L	5.00	12162		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-11-0612	UX34A	1.00	12202		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-11-0612D	UX34ADUP	1.00	12244		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-11-0612S	UX34ASPK	1.00	12285		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	ZZZZZZ	1.00	12325																														
LCSW	UX34MB1SPK	1.00	12365		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV4	1.00	12404		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB4	1.00	12440		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-9-0612	UX34B	1.00	12484		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-10-0612	UX34C	1.00	12525		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

FORM XIV

UX34 : 06142012

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 6/13/2012

SDG: UX34 | RUNID: IP061371 | METHOD: ICP | END DATE: 6/13/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
LMW-5-0612	UX48B	1.00	12571		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-3-0612	UX48C	1.00	13012		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-EB-0612	UX48D	1.00	13052		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-8-0612	UX48E	1.00	13092		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-6-0612	UX48F	1.00	13133		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-4-0612	UX48G	1.00	13173		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV5	1.00	13214		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB5	1.00	13250		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	ZZZZZZ	1.00	13304																														
ZZZZZZ	ZZZZZZ	1.00	13383																														
ZZZZZZ	ZZZZZZ	1.00	13423																														
ZZZZZZ	ZZZZZZ	1.00	13463																														
CCV	CCV6	1.00	13493		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB6	1.00	13523		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S0	S0	1.00	13582		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV7	1.00	14050		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB7	1.00	14080		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRIF	1.00	14120		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAF	1.00	14160		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABF	1.00	14200		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV8	1.00	14230		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB8	1.00	14260		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

UX34 : 06/19

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: NEXION 300D MS | START DATE: 6/14/2012

SDG: UX34 | RUNID: MS061411 METHOD: PMS | END DATE: 6/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09060				X																	X	X	X				X			
S1	S1	1.00	09090				X																	X	X	X				X			
S2	S2	1.00	09130				X																	X	X	X				X			
S3	S3	1.00	09170				X																	X	X	X				X			
S4	S4	1.00	09210				X																	X	X	X				X			
S5	S5	1.00	09260																														
ZZZZZZ	Rinse sampl	1.00	09320																														
ICV	MICV	1.00	09390				X																	X	X	X				X			
ICB	ICB	1.00	09450				X																	X	X	X				X			
CCV	MCCV1	1.00	09480				X																	X	X	X				X			
CCB	CCB1	1.00	09540				X																	X	X	X				X			
CRI	MCRI	1.00	09580				X																	X	X	X				X			
ICSA	ICSAI	1.00	10010				X																	X	X	X				X			
ICSAB	ICSABI	1.00	10070				X																	X	X	X				X			
ZZZZZZ	LR200	1.00	10140																														
ZZZZZZ	B1	1.00	10200																														
ZZZZZZ	B2	1.00	10240																														
CCV	MCCV2	1.00	10290				X																	X	X	X				X			
CCB	CCB2	1.00	10350				X																	X	X	X				X			
ZZZZZZ	UY06MB1	20.00	10440																														
ZZZZZZ	UY06MB1SPK	20.00	10470																														
ZZZZZZ	UY06A-L	100.00	10510																														
ZZZZZZ	UY06A	20.00	10550																														
ZZZZZZ	UY06ADUP	20.00	10580																														
ZZZZZZ	UY06ASPK	20.00	11020																														
ZZZZZZ	ZZZZZZ	20.00	11050																														
ZZZZZZ	UY06B	20.00	11090																														
ZZZZZZ	UY09B	100.00	11120																														
ZZZZZZ	UY09C	100.00	11160																														
CCV	MCCV3	1.00	11200				X																	X	X	X				X			
CCB	CCB3	1.00	11270				X																	X	X	X				X			
ZZZZZZ	UY09MB1	20.00	11300																														
ZZZZZZ	UY09ADUP	100.00	11340																														
ZZZZZZ	UY09A	100.00	11370																														
ZZZZZZ	UY09ASPK	100.00	11410																														

FORM XIV

UX34 : 06126

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: NEXION 300D MS | START DATE: 6/14/2012

SDG: UX34 | RUNID: MS061411 | METHOD: PMS | END DATE: 6/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	UY09D	100.00	11440																														
ZZZZZZ	UY09E	100.00	11480																														
ZZZZZZ	UY09F	100.00	11510																														
ZZZZZZ	UY09G	100.00	11550																														
ZZZZZZ	UY09H	100.00	11590																														
ZZZZZZ	UY09I	100.00	12020																														
CCV	MCCV4	1.00	12070				X																	X	X	X				X			
CCB	CCB4	1.00	12130				X																	X	X	X				X			
PBW	UX34MB1	2.00	12190				X																	X	X	X				X			
LCSW	UX34MB1SPK	2.00	12220				X																	X	X	X				X			
ZZZZZZ	UX07MBSPK	20.00	12260																														
ZZZZZZ	UX14ASPK	5.00	12290																														
LMW-11-0612L	UX34A-L	10.00	12330				X																	X	X	X				X			
LMW-11-0612	UX34A	2.00	12370				X																		X	X				X			
LMW-11-0612D	UX34ADUP	2.00	12400				X																		X	X				X			
LMW-11-0612S	UX34ASPK	2.00	12440				X																	X	X	X				X			
ZZZZZZ	ZZZZZZ	2.00	12470																														
ZZZZZZ	UY09H	500.00	12510																														
CCV	MCCV5	1.00	12550				X																	X	X	X				X			
CCB	CCB5	1.00	13020				X																	X	X	X				X			
ZZZZZZ	UX41MB1	2.00	13120																														
ZZZZZZ	UX41MB1SPK	2.00	13150																														
LMW-9-0612	UX34B	2.00	13190				X																	X	X	X				X			
LMW-10-0612	UX34C	2.00	13220				X																	X	X	X				X			
LMW-5-0612	UX48B	2.00	13260				X																	X	X	X				X			
LMW-3-0612	UX48C	2.00	13290				X																	X	X	X				X			
LMW-EB-0612	UX48D	2.00	13330				X																	X	X	X				X			
LMW-8-0612	UX48E	2.00	13360				X																	X	X	X				X			
LMW-6-0612	UX48F	2.00	13400				X																	X	X	X				X			
LMW-4-0612	UX48G	2.00	13440				X																	X	X	X				X			
CCV	MCCV6	1.00	13480				X																	X	X	X				X			
CCB	CCB6	1.00	13540				X																	X	X	X				X			

UX34 - 061411

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: NEXION 300D MS | START DATE: 6/15/2012

SDG: UX34 | RUNID: MS061511 | METHOD: PMS | END DATE: 6/15/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09280																					X									
S1	S1	1.00	09320																					X									
S2	S2	1.00	09360																					X									
S3	S3	1.00	09410																					X									
S4	S4	1.00	09460																					X									
S5	S5	1.00	09510																														
ZZZZZZ	Rinse sampl	1.00	09570																														
ICV	MICV	1.00	10020																					X									
ICB	ICB	1.00	10090																					X									
CCV	MCCV1	1.00	10140																					X									
CCB	CCB1	1.00	10210																					X									
CRI	MCRI	1.00	10250																					X									
ICSA	ICSAI	1.00	10290																					X									
ICSAB	ICSABI	1.00	10360																					X									
ZZZZZZ	LR200	1.00	10430																														
ZZZZZZ	B1	1.00	10500																														
ZZZZZZ	B2	1.00	10560																														
CCV	MCCV2	1.00	11010																					X									
CCB	CCB2	1.00	11080																					X									
ZZZZZZ	MDLCKMB	2.00	11180																														
ZZZZZZ	MDLCK1	2.00	11220																														
ZZZZZZ	MDLCK2	2.00	11260																														
ZZZZZZ	MDLCK3	2.00	11310																														
LMW-11-0612	UX34A	2.00	11350																					X									
LMW-11-0612D	UX34ADUP	2.00	11390																					X									
CCV	MCCV3	1.00	11450																					X									
CCB	CCB3	1.00	11520																					X									

UX34 : 06122

Mercury Analysis
Report and Summary QC Forms

ARI Job ID: UX34, UX48, UX61, UX62

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX61

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-11-0612	UX61A	12-10388	
LMW-11-0612D	UX61ADUP	12-10388	
LMW-11-0612S	UX61ASPK	12-10388	
LMW-9-0612	UX61B	12-10389	
PBW	UX61MB1	12-10389	
LCSW	UX61MB1SPK	12-10389	
LMW-10-0612	UX61C	12-10390	
LMW-5-0612	UX62A	12-10391	
LMW-3-0612	UX62B	12-10392	
LMW-EB-0612	UX62C	12-10393	
LMW-8-0612	UX62D	12-10394	
LMW-6-0612	UX62E	12-10395	
LMW-4-0612	UX62F	12-10396	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 6/14/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

Data Release Authorized:
Reported: 06/14/12
Date Received: 06/05/12
Page 1 of 1

QC Report No: UX61-Golder Associates
Project: Landsburg
923-1000-002-R273

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
LMW-11-0612 UX61A 12-10388	06/05/12	Water	06/11/12 06/14/12	20.0	20.0 U
LMW-9-0612 UX61B 12-10389	06/05/12	Water	06/11/12 06/14/12	20.0	20.0 U
LMW-10-0612 UX61C 12-10390	06/05/12	Water	06/11/12 06/14/12	20.0	20.0 U
MB-061112 Method Blank	NA	Water	06/11/12 06/14/12	20.0	20.0 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-11-0612
DUPLICATE

Lab Sample ID: UX61A
LIMS ID: 12-10388
Matrix: Water
Data Release Authorized:
Reported: 06/14/12

QC Report No: UX61-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	20.0 U	20.0 U	0.0%	+/- 20.0	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-11-0612
MATRIX SPIKE

Lab Sample ID: UX61A
LIMS ID: 12-10388
Matrix: Water
Data Release Authorized:
Reported: 06/14/12

QC Report No: UX61-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: 06/05/12
Date Received: 06/05/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	20.0 U	94.0	100	94.0%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: UX61LCS
LIMS ID: 12-10389
Matrix: Water
Data Release Authorized:
Reported: 06/14/12

QC Report No: UX61-Golder Associates
Project: Landsburg
923-1000-002-R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	188	200	94.0%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX61

UNITS: ng/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVL	HG061401	500.0	487.00	**97.4**	500.0	493.00	**98.6**	493.00	**98.6**	494.00	**98.8**				

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX61

ANALYTICAL RESOURCES INCORPORATED

UNITS: ng/L

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVL	HG061401	20.0	18.40	**92.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX61

UNITS: ng/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVL	HG061401	25.0	20.0	20.0	U	20.0	U	20.0	U	20.0	U				

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX61 UNITS: ng/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ng/L)	ICP LR DATE
Mercury	HG	CVL	CETAC MERCURY	253.70		25	20.0	4/1/2011		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX61

ANALYSIS METHOD: CVL

ARI PREP CODE: TLM

PREPDATE: 6/11/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-11-0612	UX61A	0.000	20.0	20.0
LMW-11-0612D	UX61ADUP	0.000	20.0	20.0
LMW-11-0612S	UX61ASPK	0.000	20.0	20.0
LMW-9-0612	UX61B	0.000	20.0	20.0
LMW-10-0612	UX61C	0.000	20.0	20.0
PBW	UX61MB1	0.000	20.0	20.0
LCSW	UX61MB1SPK	0.000	20.0	20.0
LMW-5-0612	UX62A	0.000	20.0	20.0
LMW-3-0612	UX62B	0.000	20.0	20.0
LMW-EB-0612	UX62C	0.000	20.0	20.0
LMW-8-0612	UX62D	0.000	20.0	20.0
LMW-6-0612	UX62E	0.000	20.0	20.0
LMW-4-0612	UX62F	0.000	20.0	20.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: CETAC MERCURY | START DATE: 6/14/2012

SDG: UX61 | RUNID: HG061401 | METHOD: CVL | END DATE: 6/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	10325														X																
S20	S20	1.00	10353														X																
S50	S50	1.00	10381														X																
S100	S100	1.00	10405														X																
S200	S200	1.00	10434														X																
S400	S400	1.00	10462														X																
S1000	S1000	1.00	10490														X																
ICV	AICV	1.00	10533														X																
ICB	ICB	1.00	10561														X																
CCV	ACCV1	1.00	10590														X																
CCB	CCB1	1.00	11014														X																
CRA	CRA	1.00	11042														X																
ZZZZZZ	MDLCHECK MB	1.00	11070																														
ZZZZZZ	MDLCHECK 1	1.00	11094																														
ZZZZZZ	MDLCHECK 2	1.00	11123																														
ZZZZZZ	MDLCHECK 3	1.00	11151																														
PBW	UX61MB1	1.00	11175														X																
LCSW	UX61MB1SPK	1.00	11203														X																
LMW-11-0612	UX61A	1.00	11231														X																
LMW-11-0612D	UX61ADUP	1.00	11260														X																
LMW-11-0612S	UX61ASPK	1.00	11284														X																
CCV	ACCV2	1.00	11312														X																
CCB	CCB2	1.00	11341														X																
LMW-9-0612	UX61B	1.00	11365														X																
LMW-10-0612	UX61C	1.00	11393														X																
LMW-5-0612	UX62A	1.00	11421														X																
LMW-3-0612	UX62B	1.00	11445														X																
LMW-EB-0612	UX62C	1.00	11473														X																
LMW-8-0612	UX62D	1.00	11501														X																
LMW-6-0612	UX62E	1.00	11530														X																
LMW-4-0612	UX62F	1.00	11554														X																
ZZZZZZ	UX81MB1	1.00	11582																														
ZZZZZZ	UX81MB1SPK	1.00	12010																														
CCV	ACCV3	1.00	12035														X																
CCB	CCB3	1.00	12063														X																

FORM XIV

ux61hg1.xls 6/14/2012

Table of Contents: ARI Job UX80, UX81

Client: Golder Associates

Project: 9231000002.R273 Landsburg

AV
Signature

June-18-2012
Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

July 2, 2012

Doug Morell
Golder Associates Inc.
18300 NE Union Hill Road, Suite 200
Redmond, WA 98052-3333

Client Project Name: Landsburg
Client Project Number: 923-1000-002-R273
ARI ID: UX80, UX81

Dear Mr. Morell:

Please find enclosed the original Chain of Custody record, sample receipt documentation, and the final results for the project referenced above.

Sample receipt and analytical details are addressed in the enclosed Case Narrative.

A copy of this report and all associated ARI raw data will be kept on file with ARI. Should you have any questions or problems, please feel free to call me at any time.

Respectfully,
ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
(206) 695-6211
kellyb@arilabs.com
www.arilabs.com

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Chain of Custody Documentation

ARI Job ID: UX80, UX81

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: UX80	Turn-around Requested: std
ARI Client Company: Golder	Phone: 4258830777
Client Contact: Doug Morell	
Client Project Name: Landsburg	
Client Project #: 9231000002.R273	Samplers: J.Lamberts, C.Wibler

Page: 1	of 1		
Date: 6/7/12	Ice Present? Y	No. of Coolers: 2	Cooler Temps: 5.2, 2.4

Sample ID	Date	Time	Matrix	No. Containers	VOCs(8260) Client Specific List	Total Metals TAML	Diss Metals TAML	TPH-HCID*					Notes/Comments: Diss metals are field filtered w/ 0.45µm filter
Trip Blank	6/7/12	—	DI	2	X								*Followups
LMW-7-0612		0935	W	11	X	X	HOLD	X					TPH-Dx, G
LMW-7-0612-D		0940	W	11	X	X	HOLD	X					
LMW-2-0612		1105	W	11	X	X	HOLD	X					Client Specific
													Metals + VOC
													List

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
EQuIS ELM EDD (Fee call) End of sampling event Pls cc. T.Stapp J.Lamberts	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: J. Lamberts	Printed Name: Jennifer Millsap	Printed Name:	Printed Name:
	Company: GAI	Company: ARI	Company:	Company:
	Date & Time: 6/7/2012 1539	Date & Time: 6/7/12 1539	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: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg

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

Assigned ARI Job No: UX80 Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)	5.2 2.4	
If cooler temperature is out of compliance fill out form 00070F	Temp Gun ID#:	90941614

Cooler Accepted by: JM Date: 6/7/12 Time: 1539

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used?	(Bubble Wrap) (Wet Ice) Gel Packs Baggies (Foam Block) Paper Other:		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	(YES)	NO
Were all VOC vials free of air bubbles?	NA	YES	(NO)
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	NA	5/29/12	

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

Samples Logged by: JM Date: 6/8/12 Time: 805

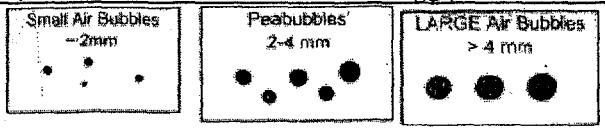
***** Notify Project Manager of discrepancies or concerns *****

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

Additional Notes, Discrepancies, & Resolutions:

Trip Blank = sm in 2012

By: JM Date: 6/8/12



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 06/08/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **UX80**

Inquiry Number: NONE
Analysis Requested: 06/08/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: JM
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 06/07/12

Project #: 9231000002.R273
Project: Landsburg
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-10467 **UX80A**	LMW-7-0612						TOT pass															
12-10468 **UX80B**	LMW-7-0612-D						TOT pass															
12-10469 **UX80C**	LMW-2-0612						TOT pass															

UX80 : 00005

Checked By JM Date 6/8/12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Golder Project Name: Landsburg

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

Assigned ARI Job No: UX87 Tracking No: NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO
Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)	5.2 2.4	

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 90941614

Cooler Accepted by: JM Date: 6/7/12 Time: 1539

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used?	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other:		
Was sufficient ice used (if appropriate)?	NA	YES	NO
Were all bottles sealed in individual plastic bags?		YES	NO
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	5/29/12	

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

Samples Logged by: JM Date: 6/8/12 Time: 805

***** 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:

Trip Blank = 5m in 2012

By: JM Date: 6/8/12

Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

PRESERVATION VERIFICATION 06/08/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **UX81**

Inquiry Number: NONE
Analysis Requested: 06/08/12
Contact: Morell, Douglas
Client: Golder Associates
Logged by: JM
Sample Set Used: Yes-119
Validatable Package: Lv4
Deliverables:

PC: Kelly
VTSR: 06/07/12

Project #: 9231000002.R273
Project: Landsburg
Sample Site:
SDG No:
Analytical Protocol: In-house

LOGNUM ARI ID	CLIENT ID	CN >12	WAD >12	NH3 <2	COD <2	FOG <2	MET <2	PHEN <2	PHOS <2	TKN <2	NO23 <2	TOC <2	S2 >9	AK102 <2	Fe2+ <2	DMET FLT	DOC FLT	PARAMETER	ADJUSTED TO	LOT NUMBER	AMOUNT ADDED	DATE/BY
12-10471 **UX81A**	LMW-7-0612						TOT pass															
12-10472 **UX81B**	LMW-7-0612-D						TOT pass															
12-10473 **UX81C**	LMW-2-0612						TOT pass															

UX81 : 00007

Checked By JM Date 6/8/12

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: UX80, UX81

Case Narrative
Project: Landsburg
ARI ID: UX80, UX81
July 2, 2012

Sample Receipt:

Analytical Resources, Inc. (ARI) accepted three water samples and a trip blank in good condition on June 7, 2012 under ARI Sample Delivery Group (SDG) UX80 and UX81. The samples were received with a cooler temperature of 5.2 and 2.4°C.

For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

Select samples were analyzed for Volatile Organics, HCID and Total Metals, as requested on the Chain of Custody. The dissolved metals were placed on hold pending further instructions. All HCID samples were non-detect and did not require follow up analyses.

Volatile Organics by Method 8260C:

The samples were analyzed on 6/15/12 - within the method recommended holding times. All samples had a pH of <2.0.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): The 2-Chloroethylviylether fell outside the 20% control limit low. All associated samples that contain these analytes have been flagged with a "Q" qualifier. No further corrective action was taken.

Surrogates: The surrogate DCE is out of control high for samples LMW-7-0612, LMW-2-0612 and the trip blank. All associated samples were non-detect, therefore no further corrective action was taken.

Method Blank(s): The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

LCS/LCSD/ RPDs(s): Are in control.

HCID by NWTPH:

The samples were extracted on 6/11/12 and analyzed on 6/12/12 - within the method recommended holding times.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Surrogates: All surrogates are in control.

Method Blank(s): The method blank was free of contamination.

Samples: There were no anomalies associated with these samples.

Case Narrative
Project: Landsburg
ARI ID: UX80, UX81
July 2, 2012

LCS/LCSD/ RPD(s): The LCS and LCSD were in control.

Total Metals by EPA Methods 6010C, 200.8, and 7471A

The samples were digested on 6/12/12. The digests were analyzed between 6/14/12 and 6/18/12 - within the method recommended holding time.

Initial calibration(s): All analytes of interest were within method acceptance criteria.

Continuing calibration(s): All analytes of interest were within method acceptance criteria.

Samples: No anomalies were encountered for these samples.

Lab Control(s): The LCS recoveries were within control limits.

Method Blank(s): The method blanks were free of contamination.

Matrix spike/ RPD(s): The matrix spike percent recoveries and RPDs are in control.

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UX80
Client: Golder Associates
Project Event: 9231000002.R273
Project Name: Landsburg

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-7-0612	UX80A	12-10467	Water	06/07/12 09:35	06/07/12 15:39
2.	LMW-7-0612-D	UX80B	12-10468	Water	06/07/12 09:40	06/07/12 15:39
3.	LMW-2-0612	UX80C	12-10469	Water	06/07/12 11:05	06/07/12 15:39
4.	Trip Blank	UX80D	12-10470	Water	06/07/12	06/07/12 15:39

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UX81
Client: Golder Associates
Project Event: 9231000002.R273
Project Name: Landsburg

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	LMW-7-0612	UX81A	12-10471	Water	06/07/12 09:35	06/07/12 15:39
2.	LMW-7-0612-D	UX81B	12-10472	Water	06/07/12 09:40	06/07/12 15:39
3.	LMW-2-0612	UX81C	12-10473	Water	06/07/12 11:05	06/07/12 15:39

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
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).

S Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA The flagged analyte was not analyzed for

NR Spiked compound recovery is not reported due to chromatographic interference

NS The flagged analyte was not spiked into the sample

M Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.

F Samples were frozen prior to particle size determination

SM Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations

SS Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis

W Weight of sample in some pipette aliquots was below the level required for accurate weighting

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
Chloromethane	0.095	0.25	**0.5**	77 – 122	≤ 40
Vinyl Chloride	0.057	0.1	**0.2**	74 – 123	≤ 40
Bromomethane	0.252	0.5	**1.0**	68 – 130	≤ 40
Chloroethane	0.086	0.1	**0.2**	68 – 133	≤ 40
Trichlorofluoromethane	0.037	0.1	**0.2**	74 – 135	≤ 40
Acrolein	2.476	2.5	**5.0**	60 – 124	≤ 40
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.043	0.1	**0.2**	76 – 124	≤ 40
Acetone	2.057	2.5	**5.0**	64 – 125	≤ 40
1,1-Dichloroethene	0.054	0.1	**0.2**	74 – 120	≤ 40
Bromoethane	0.041	0.1	**0.2**	77 – 122	≤ 40
Iodomethane	0.227	0.5	**1.0**	76 – 123	≤ 40
Methylene Chloride	0.485	0.5	**1.0**	71 – 125	≤ 40
Acrylonitrile	0.604	1.0	**1.0**	76 – 123	≤ 40
Carbon Disulfide	0.037	0.1	**0.2**	77 – 124	≤ 40
trans-1,2-Dichloroethene	0.048	0.1	**0.2**	75 – 120	≤ 40
Vinyl Acetate	0.069	0.1	**0.2**	74 – **120**	≤ 40
1,1-Dichloroethane	0.053	0.1	**0.2**	80 – 120	≤ 40
2-Butanone	0.814	2.5	**5.0**	73 – 123	≤ 40
2,2-Dichloropropane	0.052	0.1	**0.2**	72 – 133	≤ 40
cis-1,2-Dichloroethene	0.043	0.1	**0.2**	78 – 120	≤ 40
Chloroform	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Bromochloromethane	0.061	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1-Trichloroethane	0.041	0.1	**0.2**	79 – 124	≤ 40
1,1-Dichloropropene	0.034	0.1	**0.2**	**80 – 120**	≤ 40
Carbon Tetrachloride	0.044	0.1	**0.2**	71 – 139	≤ 40
1,2-Dichloroethane	0.072	0.1	**0.2**	**80** – 121	≤ 40
Benzene	0.027	0.1	**0.2**	**80 – 120**	≤ 40
Trichloroethene	0.049	0.1	**0.2**	**80 – 120**	≤ 40
1,2-Dichloropropane	0.035	0.1	**0.2**	**80 – 120**	≤ 40
Bromodichloromethane	0.051	0.1	**0.2**	**80** – 122	≤ 40
Dibromomethane	0.145	0.2	**0.2**	**80 – 120**	≤ 40
2-Chloroethylvinyl Ether	0.250	0.5	**1.0**	62 – 130	≤ 40
4-Methyl-2-Pentanone	0.974	2.5	**5.0**	**80** – 125	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)

Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	LCS Recovery[2,4]	Replicate RPD[3]
cis 1,3-dichloropropene	0.061	0.1	**0.2**	**80** – 127	≤ 40
Toluene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
trans 1,3-Dichloropropene	0.081	0.1	**0.2**	79 – 132	≤ 40
2-Hexanone	0.902	2.5	**5.0**	80 – 129	≤ 40
1,1,2-Trichloroethane	0.129	0.2	**0.2**	**80 – 120**	≤ 40
1,3-Dichloropropane	0.062	0.1	**0.2**	**80 – 120**	≤ 40
Tetrachloroethene	0.047	0.1	**0.2**	**80 – 120**	≤ 40
Dibromochloromethane	0.048	0.1	**0.2**	**80** – 120	≤ 40
1,2-Dibromoethane	0.075	0.1	**0.2**	**80 – 120**	≤ 40
Chlorobenzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Ethyl Benzene	0.037	0.1	**0.2**	**80 – 120**	≤ 40
1,1,1,2-Tetrachloroethane	0.040	0.1	**0.2**	**80** – 128	≤ 40
m,p-xylene	0.052	0.2	**0.4**	**80 – 120**	≤ 40
o-Xylene	0.035	0.1	**0.2**	**80** – 120	≤ 40
Styrene	0.045	0.1	**0.2**	**80** – 121	≤ 40
Bromoform	0.062	0.1	**0.2**	62 – 149	≤ 40
1,1,2,2-Tetrachloroethane	0.060	0.1	**0.2**	**80 – 120**	≤ 40
1,2,3-Trichloropropane	0.131	0.25	**0.5**	**80 – 120**	≤ 40
trans-1,4-Dichloro 2-Butene	0.324	0.5	**1.0**	47 – 147	≤ 40
n-Propyl Benzene	0.023	0.1	**0.2**	**80 – 120**	≤ 40
Bromobenzene	0.060	0.1	**0.2**	**80 – 120**	≤ 40
iso-propyl Benzene	0.021	0.1	**0.2**	**80 – 120**	≤ 40
2-Chloro Toluene	0.024	0.1	**0.2**	**80 – 120**	≤ 40
4-Chloro Toluene	0.016	0.1	**0.2**	**80 – 120**	≤ 40
tert-Butyl Benzene	0.026	0.1	**0.2**	**80** – 121	≤ 40
1,3,5-Trimethyl Benzene	0.015	0.1	**0.2**	**80 – 120**	≤ 40
1,2,4-Trimethylbenzene	0.024	0.1	**0.2**	**80** – 122	≤ 40
sec-Butyl Benzene	0.024	0.1	**0.2**	**80** – 121	≤ 40
4-Isopropyl Toluene	0.026	0.1	**0.2**	**80** – 124	≤ 40
1,3-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40
1,4-Dichlorobenzene	0.040	0.1	**0.2**	**80 – 120**	≤ 40
n-Butyl Benzene	0.025	0.1	**0.2**	**80** – 125	≤ 40
1,2-Dichlorobenzene	0.036	0.1	**0.2**	**80 – 120**	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary for VOA Analysis of Water 10 mL Purge Volume (EPA Method 8260C)					
Analyte	**DL[1] µg/L**	**LOD[1] µg/L**	**LOQ[1] µg/L**	**LCS Recovery[2,4]**	**Replicate RPD[3]**
1,2-Dibromo 3-Chloropropane	0.366	0.5	**0.5**	79 – 129	≤ 40
1,2,4-Trichlorobenzene	0.107	0.25	**0.5**	77 – 127	≤ 40
Hexachloro-1,3-Butadiene	0.073	0.25	**0.5**	80 – 135	≤ 40
Naphthalene	0.118	0.25	**0.5**	**80** – 128	≤ 40
1,2,3-Trichlorobenzene	0.110	0.25	**0.5**	**80** - 125	≤ 40
Dichlorodifluoromethane	0.052	0.1	**0.2**	68 – 133	≤ 40
Methyl-*tert*-butyl ether	0.073	0.25	**0.5**	79 – 121	≤ 40
Surrogate Standards			**MB / LCS**	**Samples**	**RPD**
1,2-Dichloroethane-d_4			**80 – 120**	**80** – 130	≤ 40
1,2-Dichlorobenzene-d_4			**80 – 120**	**80 – 120**	≤ 40
Toluene-d_8			**80 – 120**	**80 – 120**	≤ 40
4-Bromofluorobenzene			**80 – 120**	**80 – 120**	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD) and Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Control limits calculated using all data from 1/1/12 through 5/31/12.
(3) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(4) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that:
a. ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit or
b. Control limits for analyzes with no separate preparation procedure are adjusted to reflect the minimum uncertainty in the calibration of the instrument allowed by the referenced analytical method.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Quality Control Criteria
Total Petroleum Hydrocarbons
(Diesel & Motor Oil)

Analysis Code	Analyte[5]	DL[1]	LOD[1]	LOQ[2] ppm	Spike % Recovery Control Limits[3]			RPD[4]
					LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	--	0.50 [7]	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	--	50 [7]	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.022	0.05	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.022	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.044	0.1	0.2	64-112	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [9]	0.1	0.2	60-120 [6]	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.039	0.05	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.042	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.010	0.1	0.2	61-104	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [8]	0.1	0.2	60-120 [6]	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.35	2.5	5	62-119	50-150	50-150	≤ 40
DIESMI	DRO – NWTPH-Dext Jet A	2.22 [11]	2.5	5	60 – 130 [8]	50-150	50-150	
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.43	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	2.48	5	10	62-119	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [9]	5	10	60-120 [6]	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.28	2.5	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.06	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	1.57	5	10	60-108	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [10]	5	10	60-120 [6]	60-120	50-150	

(1) DL (Detection Limit) and LOD (Limit of Detection) as defined in ARI SOP 1018S.
(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the DL and the concentration of the lowest standard used to calibrate the GC-FID instrument.
(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.
(6) Method specified LCS acceptance limits.
(7) Method specified reporting limits
(8) Default LCS control limits pending calculation of historic limits
(9) MDL study QD55 completed 2/12/10
(10) MDL study QD35 completed 1/29/10
(11) LOD Study UI44 completed 2/28/12

Quality Control Parameters for Mercury Analysis using CVAA

	Aqueous Samples[2]			Spike Recovery		RPD[5]
	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	**0.10**[2]	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	**0.02**[3]	75 – 125	80 – 120	≤ 20
	Soil / Sediment / Tissue[4] Samples			**Spike Recovery**		**RPD[5]**
	DL[1] mg/kg	**LOD[1] mg/kg**	**LOQ[1] mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	**0.025**[3,4]	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 20 mL sample with 20 mL final volume
(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.
(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Quality Control Parameters for Metals Analysis using ICP-MS

Analyte	Mass	Aqueous Samples[2]			Spike Recovery		RPD[4]	Solids[3]
		DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ[1] mg/kg
Aluminum	27	1.601	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Antimony	121	0.010	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
	123	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #1	75	0.048	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #2	75	0.092	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Barium	135	0.020	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	137	0.019	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Beryllium	9	0.021	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Cadmium	111	0.010	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
	114	0.005	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Calcium	43	3.983	25	**50.0**	75 – 125	80 – 120	≤ 20	**50.0**
Chromium	52	0.045	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	53	0.118	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Cobalt	59	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Copper	63	0.158	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	65	0.236	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Iron	54	5.753	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
	57	3.876	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Lead	208	0.046	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Magnesium	24	0.297	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Manganese	55	0.022	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Molybdenum	98	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Nickel	60	0.079	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	62	0.089	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Potassium	39	2.944	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Selenium	82	0.127	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	78	0.324	0.25	**2.0**	75 – 125	80 – 120	≤ 20	**2.0**
Silver	107	0.008	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Sodium	23	2.833	50	**100.0**	75 – 125	80 – 120	≤ 20	**100.0**
Thorium[5]	232	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Thallium	205	0.004	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Uranium[5]	238	0.003	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Vanadium	51	0.043	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Zinc	66	0.497	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	67	0.531	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	68	0.524	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(5) ARI has no accreditation for these elements.

Quality Control Parameters for Metals Analysis using ICP-OES

	Aqueous Samples[2]			Spike Recovery		RPD[5]	Solids[3]	Tissue[4]
Analyte	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ mg/kg	LOQ mg/kg
Aluminum	7.57	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Antimony	6.28	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Arsenic	3.33	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Barium	1.33	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Beryllium	0.16	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Boron	7.39	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Cadmium	0.18	0.5	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Calcium	11.27	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Chromium	1.24	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Cobalt	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Copper	0.92	1.0	**2.0**	75 – 125	80 – 120	≤ 20	**0.2**	**0.04**
Iron	7.50	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Lead	1.55	10	**20**	75 – 125	80 – 120	≤ 20	**2.0**	**0.4**
Magnesium	9.61	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Manganese	0.28	0.5	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Molybdenum	0.79	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.1**
Nickel	3.86	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Potassium	65.70	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Selenium	4.99	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Silicon	8.17	30	**60**	75 – 125	80 – 120	≤ 20	**(6)**	**(6)**
Silver	0.43	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Sodium	11.35	250	**500**	75 – 125	80 – 120	≤ 20	**50**	**10**
Strontium	0.09	1.0	**1.0**	75 – 125	80 – 120	≤ 20	**0.1**	**0.02**
Thallium	3.10	25	**50**	75 – 125	80 – 120	≤ 20	**5.0**	**1.0**
Tin	1.41	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**
Titanium	2.11	2.5	**5.0**	75 – 125	80 – 120	≤ 20	**0.5**	**0.01**
Vanadium	0.27	1.5	**3.0**	75 – 125	80 – 120	≤ 20	**0.3**	**0.06**
Zinc	1.45	5.0	**10**	75 – 125	80 – 120	≤ 20	**1.0**	**0.2**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Tissue is reported on an "as received" (wet weight) basis using 2.5 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(6) ARI does not analyze for Silicon in solids or tissue samples

Volatile Analysis
Report and Summary QC Forms

ARI Job ID: UX80, UX81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-7-0612**
 SAMPLE

Lab Sample ID: UX80A
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized: VTS
Reported: 06/27/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 16:18

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX80A
LIMS ID: 12-10467
Matrix: Water
Date Analyzed: 06/15/12 16:18

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	124%
d8-Toluene	102%
Bromofluorobenzene	92.5%
d4-1,2-Dichlorobenzene	109%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-7-0612-D**
 SAMPLE

Lab Sample ID: UX80B
LIMS ID: 12-10468
Matrix: Water
Data Release Authorized: VD
Reported: 06/27/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 16:45

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-7-0612-D**
 SAMPLE

Lab Sample ID: UX80B
LIMS ID: 12-10468
Matrix: Water
Date Analyzed: 06/15/12 16:45

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	120%
d8-Toluene	100%
Bromofluorobenzene	94.7%
d4-1,2-Dichlorobenzene	110%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-2-0612**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX80C
LIMS ID: 12-10469
Matrix: Water
Data Release Authorized: VB
Reported: 06/27/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 17:12

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LMW-2-0612**
 SAMPLE

Lab Sample ID: UX80C
LIMS ID: 12-10469
Matrix: Water
Date Analyzed: 06/15/12 17:12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	123%
d8-Toluene	102%
Bromofluorobenzene	90.5%
d4-1,2-Dichlorobenzene	108%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: Trip Blank**
Page 1 of 2 **SAMPLE**

Lab Sample ID: UX80D
LIMS ID: 12-10470
Matrix: Water
Data Release Authorized: WD
Reported: 06/27/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 17:38

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

Lab Sample ID: UX80D
LIMS ID: 12-10470
Matrix: Water
Date Analyzed: 06/15/12 17:38

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	121%
d8-Toluene	101%
Bromofluorobenzene	94.6%
d4-1,2-Dichlorobenzene	112%

2-Chloroethylvinylether is an acid labile compound and may not be recovered from an acid preserved sample.

EPA SW-846 indicates that vinyl chloride and styrene may degrade in the presence of acid preservative.

ANALYTICAL RESOURCES INCORPORATED

VOA SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

ARI ID	Client ID	PV	DCE	TOL	BFB	DCB	TOT OUT
MB-061512A	Method Blank	10	115%	98.9%	94.1%	106%	0
LCS-061512A	Lab Control	10	103%	103%	100%	102%	0
LCSD-061512A	Lab Control Dup	10	105%	102%	99.6%	100%	0
UX80A	LMW-7-0612	10	124%*	102%	92.5%	109%	1
UX80B	LMW-7-0612-D	10	120%	100%	94.7%	110%	0
UX80C	LMW-2-0612	10	123%*	102%	90.5%	108%	1
UX80D	Trip Blank	10	121%*	101%	94.6%	112%	1

	LCS/MB LIMITS	QC LIMITS
SW8260C		
(DCE) = d4-1,2-Dichloroethane	(80-120)	(80-120)
(TOL) = d8-Toluene	(80-120)	(80-120)
(BFB) = Bromofluorobenzene	(80-120)	(80-120)
(DCB) = d4-1,2-Dichlorobenzene	(80-120)	(80-120)

Prep Method: SW5030B
Log Number Range: 12-10467 to 12-10470

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-061512A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-061512A
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized: VTS
Reported: 06/27/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst LCS: NT2/PKC
LCSD: NT2/PKC
Date Analyzed LCS: 06/15/12 09:28
LCSD: 06/15/12 09:55

Sample Amount LCS: 10.0 mL
LCSD: 10.0 mL
Purge Volume LCS: 10.0 mL
LCSD: 10.0 mL

Analyte	LCS		Spike Added-LCS	LCS Recovery	LCSD		Spike Added-LCSD	LCSD Recovery	RPD
Chloromethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Bromomethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Vinyl Chloride	4.3		4.0	108%	4.3		4.0	108%	0.0%
Chloroethane	4.6		4.0	115%	4.6		4.0	115%	0.0%
Methylene Chloride	4.3		4.0	108%	4.3		4.0	108%	0.0%
Acetone	20.2		20.0	101%	20.5		20.0	102%	1.5%
Carbon Disulfide	4.4		4.0	110%	4.4		4.0	110%	0.0%
1,1-Dichloroethene	4.1		4.0	102%	4.1		4.0	102%	0.0%
1,1-Dichloroethane	4.2		4.0	105%	4.2		4.0	105%	0.0%
trans-1,2-Dichloroethene	4.2		4.0	105%	4.1		4.0	102%	2.4%
cis-1,2-Dichloroethene	4.2		4.0	105%	4.2		4.0	105%	0.0%
Chloroform	4.4		4.0	110%	4.3		4.0	108%	2.3%
1,2-Dichloroethane	4.4		4.0	110%	4.3		4.0	108%	2.3%
2-Butanone	19.7		20.0	98.5%	19.9		20.0	99.5%	1.0%
1,1,1-Trichloroethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Carbon Tetrachloride	4.5		4.0	112%	4.4		4.0	110%	2.2%
Vinyl Acetate	3.8		4.0	95.0%	3.7		4.0	92.5%	2.7%
Bromodichloromethane	4.4		4.0	110%	4.2		4.0	105%	4.7%
1,2-Dichloropropane	4.2		4.0	105%	4.1		4.0	102%	2.4%
cis-1,3-Dichloropropene	4.1		4.0	102%	4.1		4.0	102%	0.0%
Trichloroethene	4.3		4.0	108%	4.2		4.0	105%	2.4%
Dibromochloromethane	4.1		4.0	102%	4.0		4.0	100%	2.5%
1,1,2-Trichloroethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
Benzene	4.4		4.0	110%	4.4		4.0	110%	0.0%
trans-1,3-Dichloropropene	4.6		4.0	115%	4.4		4.0	110%	4.4%
2-Chloroethylvinylether	3.5	Q	4.0	87.5%	3.5	Q	4.0	87.5%	0.0%
Bromoform	3.9		4.0	97.5%	4.0		4.0	100%	2.5%
4-Methyl-2-Pentanone (MIBK)	21.2		20.0	106%	21.6		20.0	108%	1.9%
2-Hexanone	20.0		20.0	100%	19.4		20.0	97.0%	3.0%
Tetrachloroethene	4.2		4.0	105%	4.1		4.0	102%	2.4%
1,1,2,2-Tetrachloroethane	4.1		4.0	102%	3.9		4.0	97.5%	5.0%
Toluene	4.3		4.0	108%	4.2		4.0	105%	2.4%
Chlorobenzene	4.2		4.0	105%	4.1		4.0	102%	2.4%
Ethylbenzene	4.2		4.0	105%	4.2		4.0	105%	0.0%
Styrene	4.5		4.0	112%	4.3		4.0	108%	4.5%
Trichlorofluoromethane	4.4		4.0	110%	4.4		4.0	110%	0.0%
1,1,2-Trichloro-1,2,2-trifluoroetha	4.5		4.0	112%	4.4		4.0	110%	2.2%
m,p-Xylene	8.9		8.0	111%	8.5		8.0	106%	4.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: LCS-061512A**
 LAB CONTROL SAMPLE

Lab Sample ID: LCS-061512A QC Report No: UX80-Golder Associates
LIMS ID: 12-10467 Project: Landsburg
Matrix: Water 9231000002.R273

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
o-Xylene	4.3	4.0	108%	4.1	4.0	102%	4.8%
1,2-Dichlorobenzene	4.0	4.0	100%	4.0	4.0	100%	0.0%
1,3-Dichlorobenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
1,4-Dichlorobenzene	3.9	4.0	97.5%	3.9	4.0	97.5%	0.0%
Acrolein	19.1	20.0	95.5%	19.5	20.0	97.5%	2.1%
Methyl Iodide	4.4	4.0	110%	4.2	4.0	105%	4.7%
Acrylonitrile	4.3	4.0	108%	4.4	4.0	110%	2.3%
1,1-Dichloropropene	4.3	4.0	108%	4.2	4.0	105%	2.4%
Dibromomethane	4.3	4.0	108%	4.4	4.0	110%	2.3%
1,1,1,2-Tetrachloroethane	4.1	4.0	102%	4.1	4.0	102%	0.0%
1,2-Dibromo-3-chloropropane	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
1,2,3-Trichloropropane	4.2	4.0	105%	4.2	4.0	105%	0.0%
trans-1,4-Dichloro-2-butene	4.0	4.0	100%	3.7	4.0	92.5%	7.8%
1,3,5-Trimethylbenzene	4.3	4.0	108%	4.2	4.0	105%	2.4%
1,2,4-Trimethylbenzene	4.4	4.0	110%	4.3	4.0	108%	2.3%
Hexachlorobutadiene	3.7	4.0	92.5%	3.5	4.0	87.5%	5.6%
Ethylene Dibromide	4.4	4.0	110%	4.2	4.0	105%	4.7%
Bromochloromethane	4.4	4.0	110%	4.4	4.0	110%	0.0%
2,2-Dichloropropane	4.4	4.0	110%	4.3	4.0	108%	2.3%
1,3-Dichloropropane	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
Isopropylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
n-Propylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
Bromobenzene	3.9	4.0	97.5%	3.8	4.0	95.0%	2.6%
2-Chlorotoluene	4.0	4.0	100%	3.9	4.0	97.5%	2.5%
4-Chlorotoluene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%
tert-Butylbenzene	3.4	4.0	85.0%	3.3	4.0	82.5%	3.0%
sec-Butylbenzene	4.3	4.0	108%	4.2	4.0	105%	2.4%
4-Isopropyltoluene	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
n-Butylbenzene	4.1	4.0	102%	4.0	4.0	100%	2.5%
1,2,4-Trichlorobenzene	3.7	4.0	92.5%	3.6	4.0	90.0%	2.7%
Naphthalene	3.8	4.0	95.0%	3.6	4.0	90.0%	5.4%
1,2,3-Trichlorobenzene	4.1	4.0	102%	3.9	4.0	97.5%	5.0%

Reported in µg/L (ppb)

RPD calculated using sample concentrations per SW846.

Volatile Surrogate Recovery

	LCS	LCSD
d4-1,2-Dichloroethane	103%	105%
d8-Toluene	103%	102%
Bromofluorobenzene	100%	99.6%
d4-1,2-Dichlorobenzene	102%	100%

4A
VOLATILE METHOD BLANK SUMMARY

Method Blank ID.

MB0615

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

ARI Job No: UX34
Project: LANDSBURG

Lab File ID: MB0615A
Lab Sample ID: MB0615

Date Analyzed: 06/15/12
Time Analyzed: 1058

Instrument ID: NT2
Heated Purge: (Y/N) N

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LCS0615	LCS0615	LCS0615	0928
02	LCS0615	LCS0615	LCS0615A	0955
03	LMW-11-0612	UX34A	UX34A	1125
04	LMW-9-0612	UX34B	UX34B	1152
05	LMW-10-0612	UX34C	UX34C	1218
06	TRIP BLANKS	UX34D	UX34D	1245
07	TRIP BLANK	UX48A	UX48A	1312
08	LMW-5-0612	UX48B	UX48B	1339
09	LMW-3-0612	UX48C	UX48C	1405
10	LMW-EB-0612	UX48D	UX48D	1431
11	LMW-8-0612	UX48E	UX48E	1458
12	LMW-6-0612	UX48F	UX48F	1525
13	LMW-4-0612	UX48G	UX48G	1552
14	LMW-7-0612	UX80A	UX80A	1618
15	LMW-7-0612-D	UX80B	UX80B	1645
16	LMW-2-0612	UX80C	UX80C	1712
17	TRIP BLANK	UX80D	UX80D	1738
18				
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30				

COMMENTS:

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-061512A**
Page 1 of 2 **METHOD BLANK**

Lab Sample ID: MB-061512A
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized: VTB
Reported: 06/27/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: NA
Date Received: NA

Instrument/Analyst: NT2/PKC
Date Analyzed: 06/15/12 10:58

Sample Amount: 10.0 mL
Purge Volume: 10.0 mL

CAS Number	Analyte	MDL	RL	Result
74-87-3	Chloromethane	0.10	0.5	< 0.5 U
74-83-9	Bromomethane	0.25	1.0	< 1.0 U
75-01-4	Vinyl Chloride	0.06	0.1	< 0.1 U
75-00-3	Chloroethane	0.09	0.2	< 0.2 U
75-09-2	Methylene Chloride	0.48	1.0	< 1.0 U
67-64-1	Acetone	2.1	5.0	< 5.0 U
75-15-0	Carbon Disulfide	0.04	0.2	< 0.2 U
75-35-4	1,1-Dichloroethene	0.05	0.2	< 0.2 U
75-34-3	1,1-Dichloroethane	0.05	0.2	< 0.2 U
156-60-5	trans-1,2-Dichloroethene	0.05	0.2	< 0.2 U
156-59-2	cis-1,2-Dichloroethene	0.04	0.2	< 0.2 U
67-66-3	Chloroform	0.03	0.2	< 0.2 U
107-06-2	1,2-Dichloroethane	0.07	0.2	< 0.2 U
78-93-3	2-Butanone	0.81	5.0	< 5.0 U
71-55-6	1,1,1-Trichloroethane	0.04	0.2	< 0.2 U
56-23-5	Carbon Tetrachloride	0.04	0.2	< 0.2 U
108-05-4	Vinyl Acetate	0.07	0.2	< 0.2 U
75-27-4	Bromodichloromethane	0.05	0.2	< 0.2 U
78-87-5	1,2-Dichloropropane	0.04	0.2	< 0.2 U
10061-01-5	cis-1,3-Dichloropropene	0.06	0.2	< 0.2 U
79-01-6	Trichloroethene	0.05	0.2	< 0.2 U
124-48-1	Dibromochloromethane	0.05	0.2	< 0.2 U
79-00-5	1,1,2-Trichloroethane	0.13	0.2	< 0.2 U
71-43-2	Benzene	0.03	0.2	< 0.2 U
10061-02-6	trans-1,3-Dichloropropene	0.08	0.2	< 0.2 U
110-75-8	2-Chloroethylvinylether	0.25	0.5	< 0.5 U
75-25-2	Bromoform	0.06	0.2	< 0.2 U
108-10-1	4-Methyl-2-Pentanone (MIBK)	0.97	2.5	< 2.5 U
591-78-6	2-Hexanone	0.90	5.0	< 5.0 U
127-18-4	Tetrachloroethene	0.05	0.2	< 0.2 U
79-34-5	1,1,2,2-Tetrachloroethane	0.06	0.1	< 0.1 U
108-88-3	Toluene	0.04	0.2	< 0.2 U
108-90-7	Chlorobenzene	0.02	0.2	< 0.2 U
100-41-4	Ethylbenzene	0.04	0.2	< 0.2 U
100-42-5	Styrene	0.04	0.2	< 0.2 U
75-69-4	Trichlorofluoromethane	0.04	0.2	< 0.2 U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroe	0.04	0.2	< 0.2 U
179601-23-1	m,p-Xylene	0.05	0.4	< 0.4 U
95-47-6	o-Xylene	0.04	0.2	< 0.2 U
95-50-1	1,2-Dichlorobenzene	0.04	0.2	< 0.2 U
541-73-1	1,3-Dichlorobenzene	0.04	0.2	< 0.2 U
106-46-7	1,4-Dichlorobenzene	0.04	0.2	< 0.2 U
107-02-8	Acrolein	2.5	2.5	< 2.5 U
74-88-4	Methyl Iodide	0.23	0.5	< 0.5 U
107-13-1	Acrylonitrile	0.60	1.0	< 1.0 U
563-58-6	1,1-Dichloropropene	0.03	0.1	< 0.1 U
74-95-3	Dibromomethane	0.14	0.2	< 0.2 U
630-20-6	1,1,1,2-Tetrachloroethane	0.04	0.2	< 0.2 U
96-12-8	1,2-Dibromo-3-chloropropane	0.04	0.5	< 0.5 U
96-18-4	1,2,3-Trichloropropane	0.13	0.2	< 0.2 U

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Volatiles by Purge & Trap GC/MS-Method SW8260C **Sample ID: MB-061512A**
 METHOD BLANK

Lab Sample ID: MB-061512A
LIMS ID: 12-10467
Matrix: Water
Date Analyzed: 06/15/12 10:58

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

CAS Number	Analyte	MDL	RL	Result
110-57-6	trans-1,4-Dichloro-2-butene	0.32	1.0	< 1.0 U
108-67-8	1,3,5-Trimethylbenzene	0.02	0.2	< 0.2 U
95-63-6	1,2,4-Trimethylbenzene	0.02	0.2	< 0.2 U
87-68-3	Hexachlorobutadiene	0.07	0.2	< 0.2 U
106-93-4	Ethylene Dibromide	0.08	0.1	< 0.1 U
74-97-5	Bromochloromethane	0.06	0.2	< 0.2 U
594-20-7	2,2-Dichloropropane	0.05	0.1	< 0.1 U
142-28-9	1,3-Dichloropropane	0.06	0.1	< 0.1 U
98-82-8	Isopropylbenzene	0.02	0.2	< 0.2 U
103-65-1	n-Propylbenzene	0.02	0.2	< 0.2 U
108-86-1	Bromobenzene	0.06	0.2	< 0.2 U
95-49-8	2-Chlorotoluene	0.02	0.1	< 0.1 U
106-43-4	4-Chlorotoluene	0.02	0.2	< 0.2 U
98-06-6	tert-Butylbenzene	0.03	0.2	< 0.2 U
135-98-8	sec-Butylbenzene	0.02	0.2	< 0.2 U
99-87-6	4-Isopropyltoluene	0.03	0.1	< 0.1 U
104-51-8	n-Butylbenzene	0.02	0.2	< 0.2 U
120-82-1	1,2,4-Trichlorobenzene	0.11	0.5	< 0.5 U
91-20-3	Naphthalene	0.12	0.5	< 0.5 U
87-61-6	1,2,3-Trichlorobenzene	0.11	0.2	< 0.2 U

Reported in µg/L (ppb)

Volatile Surrogate Recovery

d4-1,2-Dichloroethane	115%
d8-Toluene	98.9%
Bromofluorobenzene	94.1%
d4-1,2-Dichlorobenzene	106%

5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG SDG No.: UX34

Lab File ID: BFB0612B BFB Injection Date: 06/12/12

Instrument ID: NT2 BFB Injection Time: 0950

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	19.1
75	30.0 - 60.0% of mass 95	51.0
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.3 (0.4)1
174	50.0 - 100.0% of mass 95	83.4
175	5.0 - 9.0% of mass 174	6.3 (7.5)1
176	95.0 - 101.0% of mass 174	80.6 (96.6)1
177	5.0 - 9.0% of mass 176	5.3 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC60	IC60	6000612	06/12/12	1140
02	IC40	IC40	4000612	06/12/12	1207
03	IC20	IC20	2000612	06/12/12	1234
04	IC10	IC10	1000612	06/12/12	1301
05	IC02	IC02	0200612	06/12/12	1328
06	IC01	IC01	0100612	06/12/12	1355
07	IC0.5	IC0.5	0050612	06/12/12	1422
08	IC0.2	IC0.2	0020612	06/12/12	1449
09	IC0.1	IC0.1	0010612	06/12/12	1515
10					
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5A
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: ANALYTICAL RESOURCES INC Contract: GOLDER ASSOCIATES

Lab Code: ARI Case No.: LANDSBURG SDG No.: UX34

Lab File ID: BFB0615 BFB Injection Date: 06/15/12

Instrument ID: NT2 BFB Injection Time: 0826

GC Column: RTXVMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.8
75	30.0 - 60.0% of mass 95	49.8
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.3
173	Less than 2.0% of mass 174	0.4 (0.6)1
174	50.0 - 100.0% of mass 95	77.3
175	5.0 - 9.0% of mass 174	5.4 (7.0)1
176	95.0 - 101.0% of mass 174	77.3 (99.9)1
177	5.0 - 9.0% of mass 176	5.0 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0615	CC0615	CC0615	06/15/12	0901
02	LCS0615	LCS0615	LCS0615	06/15/12	0928
03	LCS0615	LCS0615	LCS0615A	06/15/12	0955
04	MB0615	MB0615	MB0615A	06/15/12	1058
05	LMW-11-0612	UX34A	UX34A	06/15/12	1125
06	LMW-9-0612	UX34B	UX34B	06/15/12	1152
07	LMW-10-0612	UX34C	UX34C	06/15/12	1218
08	TRIP BLANKS	UX34D	UX34D	06/15/12	1245
09	TRIP BLANK	UX48A	UX48A	06/15/12	1312
10	LMW-5-0612	UX48B	UX48B	06/15/12	1339
11	LMW-3-0612	UX48C	UX48C	06/15/12	1405
12	LMW-EB-0612	UX48D	UX48D	06/15/12	1431
13	LMW-8-0612	UX48E	UX48E	06/15/12	1458
14	LMW-6-0612	UX48F	UX48F	06/15/12	1525
15	LMW-4-0612	UX48G	UX48G	06/15/12	1552
16	LMW-7-0612	UX80A	UX80A	06/15/12	1618
17	LMW-7-0612-D	UX80B	UX80B	06/15/12	1645
18	LMW-2-0612	UX80C	UX80C	06/15/12	1712
19	TRIP BLANK	UX80D	UX80D	06/15/12	1738
20					
21					
22					

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF0.1: 0010612 RF0.2: RF0.5:
RF1: RF2:

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
Chloromethane		0.883	0.872	0.864	0.845
Vinyl Chloride	0.872	0.818	0.825	0.844	0.877
Bromomethane		0.475	0.465	0.443	0.482
Chloroethane	0.581	0.568	0.537	0.469	0.524
Trichlorofluoromethane	1.054	0.873	0.874	0.893	0.920
Acrolein	0.075	0.070	0.074	0.068	0.077
112Trichloro122Trifluoroetha	0.679	0.634	0.677	0.644	0.683
Acetone			0.125	0.116	0.122
1,1-Dichloroethene	0.814	0.674	0.644	0.649	0.660
Bromoethane	0.508	0.549	0.516	0.513	0.530
Iodomethane	1.080	1.073	1.068	1.040	1.096
Methylene Chloride		0.807	0.752	0.730	0.739
Acrylonitrile		0.123	0.115	0.132	0.146
Carbon Disulfide	2.458	2.369	2.260	2.304	2.411
Trans-1,2-Dichloroethene	0.777	0.661	0.693	0.682	0.706
Vinyl Acetate	0.464	0.450	0.507	0.514	0.553
1,1-Dichloroethane	1.275	1.223	1.192	1.170	1.199
2-Butanone		0.140	0.144	0.144	0.146
2,2-Dichloropropane	0.786	0.747	0.818	0.815	0.852
Cis-1,2-Dichloroethene	0.715	0.596	0.658	0.640	0.690
Chloroform	1.199	1.155	1.081	1.084	1.125
Bromochloromethane	0.268	0.271	0.288	0.288	0.305
1,1,1-Trichloroethane	1.054	0.950	0.945	0.934	1.005
1,1-Dichloropropene	0.546	0.478	0.508	0.530	0.558
Carbon Tetrachloride	0.611	0.552	0.532	0.553	0.601
1,2-Dichloroethane	0.484	0.422	0.430	0.447	0.456
Benzene	1.618	1.527	1.512	1.583	1.662
Trichloroethene	0.420	0.369	0.378	0.384	0.416
1,2-Dichloropropane	0.331	0.364	0.333	0.330	0.366
Bromodichloromethane	0.492	0.421	0.412	0.434	0.461
Dibromomethane	0.192	0.180	0.167	0.180	0.178
2-Chloroethyl Vinyl Ether			0.085	0.090	0.101
4-Methyl-2-Pentanone		0.067	0.070	0.077	0.091
Cis 1,3-dichloropropene	0.421	0.423	0.420	0.431	0.469
Toluene	0.943	0.852	0.834	0.846	0.909
Trans 1,3-Dichloropropene	0.378	0.321	0.349	0.380	0.402
2-Hexanone		0.117	0.117	0.130	0.146

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF0.1: 0010612 RF0.2: RF0.5:
RF1: RF2:

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
1,1,2-Trichloroethane	0.205	0.223	0.210	0.223	0.230
1,3-Dichloropropane	0.451	0.442	0.422	0.428	0.460
Tetrachloroethene	0.451	0.484	0.408	0.442	0.471
Chlorodibromomethane	0.298	0.278	0.269	0.286	0.297
1,2-Dibromoethane	0.200	0.180	0.197	0.219	0.221
Chlorobenzene	1.118	1.001	1.015	1.065	1.082
Ethyl Benzene	0.557	0.525	0.505	0.556	0.622
1,1,1,2-Tetrachloroethane	0.462	0.393	0.414	0.389	0.435
m,p-xylene	0.617	0.619	0.612	0.675	0.753
o-Xylene	0.531	0.531	0.577	0.658	0.729
Styrene	0.731	0.736	0.776	0.912	1.032
Bromoform	0.305	0.252	0.233	0.285	0.282
1,1,2,2-Tetrachloroethane	0.607	0.553	0.531	0.561	0.568
1,2,3-Trichloropropane		0.168	0.145	0.179	0.174
Trans-1,4-Dichloro 2-Butene			0.131	0.126	0.139
N-Propyl Benzene	3.137	3.151	2.782	3.173	3.444
Bromobenzene	0.743	0.685	0.681	0.713	0.720
Isopropyl Benzene	2.314	2.136	2.231	2.668	3.020
2-Chloro Toluene	2.242	2.277	2.079	2.310	2.514
4-Chloro Toluene	1.889	1.999	1.849	2.129	2.226
T-Butyl Benzene	1.589	1.505	1.392	1.849	2.070
1,3,5-Trimethyl Benzene	2.081	2.096	1.919	2.342	2.661
1,2,4-Trimethylbenzene	1.810	1.909	1.872	2.367	2.696
S-Butyl Benzene	2.279	2.402	2.224	2.988	3.304
4-Isopropyl Toluene	1.710	1.777	1.678	2.313	2.587
1,3-Dichlorobenzene	1.482	1.477	1.380	1.520	1.551
1,4-Dichlorobenzene	1.725	1.664	1.476	1.546	1.613
N-Butyl Benzene	1.986	1.923	1.632	2.056	2.300
1,2-Dichlorobenzene	1.633	1.451	1.346	1.442	1.471
1,2-Dibromo 3-Chloropropane		0.076	0.076	0.094	0.090
1,2,4-Trichlorobenzene	1.010	0.878	0.740	0.821	0.861
Hexachloro 1,3-Butadiene		0.582	0.384	0.509	0.548
Naphthalene		1.058	1.013	1.110	1.281
1,2,3-Trichlorobenzene		0.704	0.634	0.675	0.726
Dichlorodifluoromethane	0.377	0.466	0.512	0.562	0.559
Methyl tert butyl ether	1.506	1.443	1.534	1.510	1.708

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF0.1: 0010612 RF0.2: RF0.5:
RF1: RF2:

COMPOUND	RF0.1	RF0.2	RF0.5	RF1	RF2
d4-1,2-Dichloroethane	0.575	0.564	0.560	0.544	0.540
d8-Toluene	1.175	1.158	1.159	1.179	1.192
4-Bromofluorobenzene	0.501	0.501	0.520	0.525	0.534
d4-1,2-Dichlorobenzene	0.933	0.930	0.916	0.902	0.911
Dibromofluoromethane	0.532	0.526	0.536	0.520	0.512

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF10: RF20: RF40:
RF60:

COMPOUND	RF10	RF20	RF40	RF60
Chloromethane	0.737	0.756	0.767	0.748
Vinyl Chloride	0.780	0.825	0.835	0.806
Bromomethane	0.408	0.422	0.421	0.400
Chloroethane	0.461	0.463	0.350	0.334
Trichlorofluoromethane	0.830	0.863	0.870	0.854
Acrolein	0.071	0.076	0.080	0.072
112Trichloro122Trifluoroetha	0.599	0.626	0.638	0.629
Acetone	0.102	0.109	0.113	0.101
1,1-Dichloroethene	0.581	0.596	0.612	0.586
Bromoethane	0.478	0.500	0.519	0.491
Iodomethane	0.979	1.010	1.032	0.986
Methylene Chloride	0.659	0.675	0.697	0.656
Acrylonitrile	0.135	0.144	0.151	0.139
Carbon Disulfide	2.134	2.232	2.268	2.150
Trans-1,2-Dichloroethene	0.640	0.674	0.696	0.656
Vinyl Acetate	0.547	0.623	0.646	0.601
1,1-Dichloroethane	1.096	1.136	1.149	1.092
2-Butanone	0.139	0.155	0.159	0.145
2,2-Dichloropropane	0.772	0.827	0.855	0.826
Cis-1,2-Dichloroethene	0.636	0.662	0.681	0.647
Chloroform	1.018	1.065	1.084	1.034
Bromochloromethane	0.273	0.284	0.289	0.274
1,1,1-Trichloroethane	0.920	0.968	0.989	0.949
1,1-Dichloropropene	0.539	0.564	0.559	0.544
Carbon Tetrachloride	0.538	0.548	0.546	0.535
1,2-Dichloroethane	0.416	0.423	0.419	0.404
Benzene	1.518	1.553	1.529	1.458
Trichloroethene	0.366	0.380	0.379	0.371
1,2-Dichloropropane	0.332	0.347	0.348	0.334
Bromodichloromethane	0.431	0.453	0.456	0.445
Dibromomethane	0.166	0.169	0.168	0.159
2-Chloroethyl Vinyl Ether	0.105	0.127	0.126	0.115
4-Methyl-2-Pentanone	0.092	0.099	0.099	0.091
Cis 1,3-dichloropropene	0.469	0.506	0.511	0.490
Toluene	0.840	0.874	0.872	0.834
Trans 1,3-Dichloropropene	0.389	0.417	0.412	0.376
2-Hexanone	0.146	0.156	0.151	0.139

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF10: RF20: RF40:
RF60:

COMPOUND	RF10	RF20	RF40	RF60
1,1,2-Trichloroethane	0.210	0.219	0.219	0.207
1,3-Dichloropropane	0.419	0.450	0.443	0.431
Tetrachloroethene	0.418	0.434	0.425	0.426
Chlorodibromomethane	0.290	0.314	0.315	0.314
1,2-Dibromoethane	0.205	0.215	0.216	0.193
Chlorobenzene	0.985	1.012	0.989	0.972
Ethyl Benzene	0.576	0.602	0.588	0.596
1,1,1,2-Tetrachloroethane	0.407	0.416	0.412	0.421
m,p-xylene	0.716	0.743	0.710	0.698
o-Xylene	0.745	0.784	0.772	0.778
Styrene	1.101	1.133	1.153	1.133
Bromoform	0.292	0.322	0.340	0.325
1,1,2,2-Tetrachloroethane	0.530	0.569	0.574	0.551
1,2,3-Trichloropropane	0.162	0.172	0.170	0.161
Trans-1,4-Dichloro 2-Butene	0.133	0.151	0.156	0.148
N-Propyl Benzene	3.408	3.577	3.585	3.447
Bromobenzene	0.664	0.704	0.719	0.694
Isopropyl Benzene	3.158	3.356	3.399	3.310
2-Chloro Toluene	2.429	2.580	2.610	2.552
4-Chloro Toluene	2.145	2.284	2.309	2.245
T-Butyl Benzene	2.217	2.384	2.394	2.356
1,3,5-Trimethyl Benzene	2.712	2.865	2.839	2.736
1,2,4-Trimethylbenzene	2.732	2.866	2.849	2.762
S-Butyl Benzene	3.340	3.523	3.458	3.337
4-Isopropyl Toluene	2.668	2.850	2.796	2.724
1,3-Dichlorobenzene	1.420	1.493	1.472	1.437
1,4-Dichlorobenzene	1.435	1.499	1.478	1.441
N-Butyl Benzene	2.403	2.455	2.456	2.366
1,2-Dichlorobenzene	1.355	1.403	1.339	1.300
1,2-Dibromo 3-Chloropropane	0.087	0.092	0.082	0.076
1,2,4-Trichlorobenzene	0.886	0.935	0.844	0.796
Hexachloro 1,3-Butadiene	0.451	0.439	0.396	0.361
Naphthalene	1.447	1.557	1.407	1.284
1,2,3-Trichlorobenzene	0.728	0.728	0.652	0.588
Dichlorodifluoromethane	0.500	0.534	0.539	0.535
Methyl tert butyl ether	1.589	1.671	1.717	1.602

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

LAB FILE ID: RF10: RF20: RF40:
RF60:

COMPOUND	RF10	RF20	RF40	RF60
d4-1,2-Dichloroethane	0.520	0.519	0.530	0.510
d8-Toluene	1.218	1.219	1.231	1.201
4-Bromofluorobenzene	0.525	0.521	0.510	0.511
d4-1,2-Dichlorobenzene	0.923	0.918	0.877	0.861
Dibromofluoromethane	0.509	0.516	0.527	0.510

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: 20120612 | Project: LANDSBURG

Instrument ID: NT2 | Calibration Date: 06/12/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
Chloromethane	AVRG	0.809	7.7
Vinyl Chloride	AVRG	0.831	3.6
Bromomethane	AVRG	0.440	7.1
Chloroethane	AVRG	0.476	18.5
Trichlorofluoromethane	AVRG	0.892	7.3
Acrolein	AVRG	0.074	5.2
112Trichloro122Trifluoroetha	AVRG	0.646	4.4
Acetone	AVRG	0.112	8.1
1,1-Dichloroethene	AVRG	0.646	11.0
Bromoethane	AVRG	0.512	4.1
Iodomethane	AVRG	1.040	4.0
Methylene Chloride	AVRG	0.714	7.3
Acrylonitrile	AVRG	0.136	8.8
Carbon Disulfide	AVRG	2.287	4.8
Trans-1,2-Dichloroethene	AVRG	0.687	5.8
Vinyl Acetate	AVRG	0.545	12.6
1,1-Dichloroethane	AVRG	1.170	5.1
2-Butanone	AVRG	0.146	4.8
2,2-Dichloropropane	AVRG	0.811	4.4
Cis-1,2-Dichloroethene	AVRG	0.658	5.2
Chloroform	AVRG	1.094	5.2
Bromochloromethane	AVRG	0.282	4.2
1,1,1-Trichloroethane	AVRG	0.968	4.3
1,1-Dichloropropene	AVRG	0.536	5.2
Carbon Tetrachloride	AVRG	0.557	5.1
1,2-Dichloroethane	AVRG	0.433	5.7
Benzene	AVRG	1.551	4.0
Trichloroethene	AVRG	0.385	5.1
1,2-Dichloropropane	AVRG	0.343	4.1
Bromodichloromethane	AVRG	0.445	5.4
Dibromomethane	AVRG	0.173	5.7
2-Chloroethyl Vinyl Ether	AVRG	0.107	15.3
4-Methyl-2-Pentanone	AVRG	0.086	14.8
Cis 1,3-dichloropropene	AVRG	0.460	8.1
Toluene	AVRG	0.867	4.3
Trans 1,3-Dichloropropene	AVRG	0.380	8.0
2-Hexanone	AVRG	0.138	10.9

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
1,1,2-Trichloroethane	AVRG	0.216	3.9
1,3-Dichloropropane	AVRG	0.438	3.2
Tetrachloroethene	AVRG	0.440	5.7
Chlorodibromomethane	AVRG	0.296	5.6
1,2-Dibromoethane	AVRG	0.205	6.7
Chlorobenzene	AVRG	1.026	4.8
Ethyl Benzene	AVRG	0.570	6.6
1,1,1,2-Tetrachloroethane	AVRG	0.417	5.2
m,p-xylene	AVRG	0.683	8.0
o-Xylene	AVRG	0.678	15.7
Styrene	AVRG	0.968	18.6
Bromoform	AVRG	0.293	11.9
1,1,2,2-Tetrachloroethane	AVRG	0.560	4.2
1,2,3-Trichloropropane	AVRG	0.166	6.3
Trans-1,4-Dichloro 2-Butene	AVRG	0.141	8.0
N-Propyl Benzene	AVRG	3.301	7.9
Bromobenzene	AVRG	0.703	3.4
Isopropyl Benzene	AVRG	2.844	18.0
2-Chloro Toluene	AVRG	2.399	7.6
4-Chloro Toluene	AVRG	2.120	8.0
T-Butyl Benzene	LINR		0.9998
1,3,5-Trimethyl Benzene	AVRG	2.472	14.8
1,2,4-Trimethylbenzene	AVRG	2.429	18.4
S-Butyl Benzene	AVRG	2.984	17.9
4-Isopropyl Toluene	LINR		0.9996
1,3-Dichlorobenzene	AVRG	1.470	3.5
1,4-Dichlorobenzene	AVRG	1.542	6.7
N-Butyl Benzene	AVRG	2.175	13.3
1,2-Dichlorobenzene	AVRG	1.416	7.1
1,2-Dibromo 3-Chloropropane	AVRG	0.084	8.7
1,2,4-Trichlorobenzene	AVRG	0.863	9.1
Hexachloro 1,3-Butadiene	AVRG	0.458	17.5
Naphthalene	AVRG	1.270	15.4
1,2,3-Trichlorobenzene	AVRG	0.680	7.6
Dichlorodifluoromethane	AVRG	0.509	11.4
Methyl tert butyl ether	AVRG	1.586	6.1

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

FORM 6
VOLATILE INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: 20120612 Project: LANDSBURG

Instrument ID: NT2 Calibration Date: 06/12/12

COMPOUND	CURVE TYPE	AVE RF	%RSD OR R^2
d4-1,2-Dichloroethane	AVRG	0.540	4.1
d8-Toluene	AVRG	1.192	2.2
4-Bromofluorobenzene	AVRG	0.516	2.2
d4-1,2-Dichlorobenzene	AVRG	0.908	2.7
Dibromofluoromethane	AVRG	0.521	1.9

<- Indicates value outside QC limits:
(%RSD < 20% or R^2 > 0.990)

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC — Client: GOLDER ASSOCIATES

ARI Job No: UX34 — Project: LANDSBURG

Instrument ID: NT2 — Cont. Calib. Date: 06/15/12

Init. Calib. Date: 06/12/12 — Cont. Calib. Time: 0901

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Chloromethane	0.809	0.8856	0.100	AVRG	9.5	
Vinyl Chloride	0.831	0.8846	0.010	AVRG	6.4	
Bromomethane	0.440	0.4828	0.010	AVRG	9.7	
Chloroethane	0.476	0.5622	0.010	AVRG	18.1	
Trichlorofluoromethane	0.892	1.0031	0.010	AVRG	12.4	
Acrolein	0.074	0.0714	0.010	AVRG	-3.5	
112Trichloro122Trifluoroetha	0.645	0.7262	0.010	AVRG	12.6	
Acetone	0.112	0.1054	0.010	AVRG	-5.9	
1,1-Dichloroethene	0.646	0.6622	0.010	AVRG	2.5	
Bromoethane	0.512	0.5445	0.010	AVRG	6.3	
Iodomethane	1.040	1.1424	0.010	AVRG	9.8	
Methylene Chloride	0.714	0.7554	0.010	AVRG	5.8	
Acrylonitrile	0.136	0.1416	0.010	AVRG	4.1	
Carbon Disulfide	2.287	2.5868	0.010	AVRG	13.1	
Trans-1,2-Dichloroethene	0.687	0.7279	0.010	AVRG	6.0	
Vinyl Acetate	0.545	0.4955	0.010	AVRG	-9.1	
1,1-Dichloroethane	1.170	1.2184	0.100	AVRG	4.1	
2-Butanone	0.146	0.1320	0.010	AVRG	-9.6	
2,2-Dichloropropane	0.811	0.9135	0.010	AVRG	12.6	
Cis-1,2-Dichloroethene	0.658	0.6997	0.010	AVRG	6.3	
Chloroform	1.094	1.1669	0.010	AVRG	6.7	
Bromochloromethane	0.282	0.3088	0.010	AVRG	9.5	
1,1,1-Trichloroethane	0.968	1.0618	0.010	AVRG	9.7	
1,1-Dichloropropene	0.536	0.6036	0.010	AVRG	12.6	
Carbon Tetrachloride	0.557	0.6495	0.010	AVRG	16.6	
1,2-Dichloroethane	0.433	0.4598	0.010	AVRG	6.2	
Benzene	1.551	1.7067	0.010	AVRG	10.0	
Trichloroethene	0.385	0.4022	0.010	AVRG	4.5	
1,2-Dichloropropane	0.343	0.3554	0.010	AVRG	3.6	
Bromodichloromethane	0.445	0.4661	0.010	AVRG	4.7	
Dibromomethane	0.173	0.1812	0.010	AVRG	4.7	
2-Chloroethyl Vinyl Ether	0.107	0.0850	0.010	AVRG	-20.6	<-
4-Methyl-2-Pentanone	0.086	0.0932	0.010	AVRG	8.4	
Cis 1,3-dichloropropene	0.460	0.4608	0.010	AVRG	0.2	
Toluene	0.867	0.9013	0.010	AVRG	4.0	
Trans 1,3-Dichloropropene	0.380	0.3861	0.010	AVRG	1.6	
2-Hexanone	0.138	0.1281	0.010	AVRG	-7.2	

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII VOA

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: UX34 Project: LANDSBURG

Instrument ID: NT2 Cont. Calib. Date: 06/15/12

Init. Calib. Date: 06/12/12 Cont. Calib. Time: 0901

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1,1,2-Trichloroethane	0.216	0.2215	0.010	AVRG	2.5
1,3-Dichloropropane	0.438	0.4097	0.010	AVRG	-6.5
Tetrachloroethene	0.440	0.4474	0.010	AVRG	1.7
Chlorodibromomethane	0.296	0.2972	0.010	AVRG	0.4
1,2-Dibromoethane	0.205	0.2012	0.010	AVRG	-1.8
Chlorobenzene	1.026	1.0112	0.300	AVRG	-1.4
Ethyl Benzene	0.570	0.6213	0.010	AVRG	9.0
1,1,1,2-Tetrachloroethane	0.416	0.4512	0.010	AVRG	8.5
m,p-xylene	0.682	0.7683	0.010	AVRG	12.6
o-Xylene	0.678	0.7943	0.010	AVRG	17.2
Styrene	0.967	1.0982	0.010	AVRG	13.6
Bromoform	0.293	0.2776	0.100	AVRG	-5.2
1,1,2,2-Tetrachloroethane	0.560	0.5259	0.300	AVRG	-6.1
1,2,3-Trichloropropane	0.166	0.1564	0.010	AVRG	-5.8
Trans-1,4-Dichloro 2-Butene	0.140	0.1292	0.010	AVRG	-7.7
N-Propyl Benzene	3.300	3.3394	0.010	AVRG	1.2
Bromobenzene	0.702	0.6442	0.010	AVRG	-8.2
Isopropyl Benzene	2.844	3.1062	0.010	AVRG	9.2
2-Chloro Toluene	2.399	2.3997	0.010	AVRG	0.0
4-Chloro Toluene	2.119	2.0575	0.010	AVRG	-2.9
T-Butyl Benzene	10.000	8.992	0.010	LINR	-10.1
1,3,5-Trimethyl Benzene	2.472	2.7345	0.010	AVRG	10.6
1,2,4-Trimethylbenzene	2.429	2.7514	0.010	AVRG	13.3
S-Butyl Benzene	2.984	3.2728	0.010	AVRG	9.7
4-Isopropyl Toluene	10.000	9.525	0.010	LINR	-4.8
1,3-Dichlorobenzene	1.470	1.4408	0.010	AVRG	-2.0
1,4-Dichlorobenzene	1.542	1.4517	0.010	AVRG	-5.8
N-Butyl Benzene	2.175	2.3163	0.010	AVRG	6.5
1,2-Dichlorobenzene	1.416	1.3950	0.010	AVRG	-1.5
1,2-Dibromo 3-Chloropropane	0.084	0.0818	0.010	AVRG	-2.6
1,2,4-Trichlorobenzene	0.863	0.8490	0.010	AVRG	-1.6
Hexachloro 1,3-Butadiene	0.459	0.4110	0.010	AVRG	-10.4
Naphthalene	1.270	1.3180	0.010	AVRG	3.8
1,2,3-Trichlorobenzene	0.679	0.6866	0.010	AVRG	1.1
Dichlorodifluoromethane	0.509	0.6039	0.010	AVRG	18.6
Methyl tert butyl ether	1.587	1.7010	0.010	AVRG	7.2

<- Exceeds QC limit of 20% D
* RF less than minimum RF

FORM VII VOA

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

ARI Job No: UX34 Project: LANDSBURG

Instrument ID: NT2 Cont. Calib. Date: 06/15/12

Init. Calib. Date: 06/12/12 Cont. Calib. Time: 0901

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
d4-1,2-Dichloroethane	0.540	0.5330	0.010	AVRG	-1.3
d8-Toluene	1.192	1.2311	0.010	AVRG	3.3
4-Bromofluorobenzene	0.516	0.5164	0.010	AVRG	0.1
d4-1,2-Dichlorobenzene	0.908	0.9351	0.010	AVRG	3.0
Dibromofluoromethane	0.521	0.5544	0.010	AVRG	6.4

<- Exceeds QC limit of 20% D
* RF less than minimum RF

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: UX34 | Project: LANDSBURG

Ical Midpoint ID: 0100612 | Ical Date: 06/12/12

Instrument ID: NT2 | Project Run Date: 06/15/12

		IS1(PFB) AREA #	RT #	IS2(DFB) AREA #	RT #	IS3(CLB) AREA #	RT #
	ICAL MIDPT	261822	5.45	396657	5.84	349890	7.92
	UPPER LIMIT	523644	5.95	793314	6.34	699780	8.42
	LOWER LIMIT	130911	4.95	198328	5.34	174945	7.42
	Sample ID						
01	LCS0615	231343	5.45	339206	5.84	317093	7.92
02	LCS0615	225411	5.45	335965	5.84	314876	7.92
03	MB0615	209164	5.45	333543	5.84	297694	7.92
04	LMW-11-0612	222002	5.45	356479	5.84	320269	7.92
05	LMW-9-0612	200813	5.45	310471	5.85	278245	7.92
06	LMW-10-0612	202572	5.45	324175	5.85	294063	7.92
07	TRIP BLANKS	198450	5.45	321719	5.84	289827	7.92
08	TRIP BLANK	203325	5.45	335374	5.85	300268	7.92
09	LMW-5-0612	208373	5.45	341772	5.85	311362	7.92
10	LMW-3-0612	188190	5.45	296241	5.85	266341	7.92
11	LMW-EB-0612	184747	5.45	295087	5.85	269055	7.92
12	LMW-8-0612	181742	5.45	299941	5.84	271822	7.92
13	LMW-6-0612	199107	5.45	330781	5.85	301947	7.92
14	LMW-4-0612	183279	5.45	289875	5.84	263702	7.92
15	LMW-7-0612	184341	5.45	300569	5.85	277630	7.92
16	LMW-7-0612-D	180108	5.45	281881	5.84	256616	7.92
17	LMW-2-0612	192239	5.45	321218	5.85	298561	7.92
18	TRIP BLANK	174823	5.45	277182	5.85	255261	7.92
19							
20							
21							
22							

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CLB) = d5-Chlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

8A
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: GOLDER ASSOCIATES

ARI Job No: UX34 | Project: LANDSBURG

Ical Midpoint ID: 0100612 | Ical Date: 06/12/12

Instrument ID: NT2 | Project Run Date: 06/15/12

		IS4(DCB) AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	227035	9.62				
	UPPER LIMIT	454070	10.12				
	LOWER LIMIT	113518	9.12				
	Sample ID						
01	LCS0615	214725	9.62				
02	LCS0615	211864	9.62				
03	MB0615	188007	9.62				
04	LMW-11-0612	194507	9.62				
05	LMW-9-0612	181612	9.62				
06	LMW-10-0612	184022	9.62				
07	TRIP BLANKS	181956	9.62				
08	TRIP BLANK	183367	9.62				
09	LMW-5-0612	187575	9.62				
10	LMW-3-0612	173199	9.62				
11	LMW-EB-0612	173191	9.62				
12	LMW-8-0612	176596	9.62				
13	LMW-6-0612	183736	9.62				
14	LMW-4-0612	173897	9.62				
15	LMW-7-0612	176019	9.62				
16	LMW-7-0612-D	172995	9.62				
17	LMW-2-0612	180735	9.62				
18	TRIP BLANK	169107	9.62				
19							
20							
21							
22							

IS4 (DCB) = d4-1,4-Dichlorobenzene

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Ical midpoint
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Ical midpoint

* Values outside of QC limits.

HCID Analysis
Report and Summary QC Forms

ARI Job ID: UX80, UX81

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Extraction Method: SW3510C

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

Matrix: Water

Data Release Authorized: 
Reported: 06/12/12

ARI ID	Sample ID	Extraction Date	Analysis Date	DL	Range	Result
MB-061112	Method Blank	06/11/12	06/12/12	1.0	Gas	< 0.25 U
12-10467					Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	94.3%
UX80A	LMW-7-0612	06/11/12	06/12/12	1.0	Gas	< 0.25 U
12-10467	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	93.3%
UX80B	LMW-7-0612-D	06/11/12	06/12/12	1.0	Gas	< 0.25 U
12-10468	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	92.3%
UX80C	LMW-2-0612	06/11/12	06/12/12	1.0	Gas	< 0.25 U
12-10469	HC ID: ---				Diesel	< 0.50 U
					Oil	< 0.50 U
					o-Terphenyl	95.9%

Reported in mg/L (ppm)

Gas value based on total peaks in the range from Toluene to C12.
Diesel value based on the total peaks in the range from C12 to C24.
Oil value based on the total peaks in the range from C24 to C38.

ANALYTICAL RESOURCES INCORPORATED

HCID SURROGATE RECOVERY SUMMARY

Matrix: Water

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273

Client ID	O-TER	TOT OUT
MB-061112	94.3%	0
LCS-061112	100%	0
LCSD-061112	102%	0
LMW-7-0612	93.3%	0
LMW-7-0612-D	92.3%	0
LMW-2-0612	95.9%	0

	LCS/MB LIMITS	QC LIMITS
(O-TER) = o-Terphenyl	(55-110)	(50-150)

Prep Method: SW3510C
Log Number Range: 12-10467 to 12-10469

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPH-HCID Method by GC/FID
Page 1 of 1

Sample ID: LCS-061112
LCS/LCSD

Lab Sample ID: LCS-061112
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized:
Reported: 06/12/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Date Extracted LCS/LCSD: 06/11/12
Date Analyzed LCS: 06/12/12 01:06
LCSD: 06/12/12 01:25
Instrument/Analyst LCS: FID/AAR
LCSD: FID/AAR

Sample Amount LCS: 500 mL
LCSD: 500 mL
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.00
LCSD: 1.00

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	2.43	3.00	81.0%	2.48	3.00	82.7%	2.0%

HCID Surrogate Recovery

	LCS	LCSD
o-Terphenyl	100%	102%

Results reported in mg/L
RPD calculated using sample concentrations per SW846.

TPH METHOD BLANK SUMMARY

BLANK NO.: UX80MBW1

Lab Name: ANALYTICAL RESOURCES INC
Client: GOLDER ASSOCIATES

SDG No.: UX80
Project No.: LANDSBURG

Date Extracted: 06/11/12
Matrix: LIQUID

Date Analyzed : 06/12/12
Instrument ID : FID3B

Time Analyzed : 0047

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UX80LCSW1	UX80LCSW1	06/12/12
02	UX80LCSDW1	UX80LCSDW1	06/12/12
03	LMW-7-0612	UX80A	06/12/12
04	LMW-7-0612-D	UX80B	06/12/12
05	LMW-2-0612	UX80C	06/12/12
06			
07			
08			
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FORM IV TPH

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: GOLDER ASSOCIATES

SDG No.: UX80 Project: LANDSBURG

Instrument ID: FID3B GC Column: RTX-1

Run Date: 06/11/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 5.57 TRIAC: 7.40

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	G/DHCIDWATER	G/DHCIDWATER	06/12/12	0009	5.58	7.40
02	MOILHCIDWATE	MOILHCIDWATE	06/12/12	0028	5.57	7.40
03	UX80MBW1	UX80MBW1	06/12/12	0047	5.57	7.40
04	UX80LCSW1	UX80LCSW1	06/12/12	0106	5.58	7.40
05	UX80LCSDW1	UX80LCSDW1	06/12/12	0125	5.58	7.40
06	LMW-7-0612	UX80A	06/12/12	0144	5.57	7.40
07	LMW-7-0612-D	UX80B	06/12/12	0204	5.57	7.40
08	LMW-2-0612	UX80C	06/12/12	0223	5.57	7.40

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

Metals Analysis
Report and Summary QC Forms

ARI Job ID: UX80, UX81

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-7-0612	UX80A	12-10467	
LMW-7-0612D	UX80ADUP	12-10467	
LMW-7-0612S	UX80ASPK	12-10467	
LMW-7-0612-D	UX80B	12-10468	
PBW	UX80MB1	12-10468	
LCSW	UX80MB1SPK	12-10468	
LMW-2-0612	UX80C	12-10469	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

_____

_____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 6/19/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-0612
SAMPLE

Lab Sample ID: UX80A
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/12/12	6010C	06/15/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/12/12	200.8	06/15/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/12/12	200.8	06/18/12	**7440-38-2**	**Arsenic**	0.048	0.2	**2.3**	
3010A	06/12/12	6010C	06/15/12	**7440-39-3**	**Barium**	1.33	3	**478**	
3010A	06/12/12	6010C	06/15/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/12/12	6010C	06/15/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/12/12	6010C	06/15/12	**7440-70-2**	**Calcium**	11.3	50	**54,800**	
3010A	06/12/12	6010C	06/15/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/12/12	6010C	06/15/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/12/12	6010C	06/15/12	**7439-89-6**	**Iron**	7.5	50	**1,270**	
200.8	06/12/12	200.8	06/15/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/12/12	6010C	06/15/12	**7439-95-4**	**Magnesium**	9.6	50	**25,400**	
3010A	06/12/12	6010C	06/15/12	**7439-96-5**	**Manganese**	0.28	1	**169**	
3010A	06/12/12	6010C	06/15/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/12/12	6010C	06/15/12	**7440-09-7**	**Potassium**	65.7	500	**2,950**	
200.8	06/12/12	200.8	06/15/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/12/12	6010C	06/15/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/12/12	6010C	06/15/12	**7440-23-5**	**Sodium**	11.4	500	**36,500**	
200.8	06/12/12	200.8	06/15/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/12/12	6010C	06/15/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-0612-D
SAMPLE

Lab Sample ID: UX80B
LIMS ID: 12-10468
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/12/12	6010C	06/15/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/12/12	200.8	06/15/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/12/12	200.8	06/18/12	**7440-38-2**	**Arsenic**	0.048	0.2	**2.3**	
3010A	06/12/12	6010C	06/15/12	**7440-39-3**	**Barium**	1.33	3	**482**	
3010A	06/12/12	6010C	06/15/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/12/12	6010C	06/15/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/12/12	6010C	06/15/12	**7440-70-2**	**Calcium**	11.3	50	**55,300**	
3010A	06/12/12	6010C	06/15/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/12/12	6010C	06/15/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/12/12	6010C	06/15/12	**7439-89-6**	**Iron**	7.5	50	**1,280**	
200.8	06/12/12	200.8	06/15/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/12/12	6010C	06/15/12	**7439-95-4**	**Magnesium**	9.6	50	**25,600**	
3010A	06/12/12	6010C	06/15/12	**7439-96-5**	**Manganese**	0.28	1	**170**	
3010A	06/12/12	6010C	06/15/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/12/12	6010C	06/15/12	**7440-09-7**	**Potassium**	65.7	500	**2,990**	
200.8	06/12/12	200.8	06/15/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/12/12	6010C	06/15/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/12/12	6010C	06/15/12	**7440-23-5**	**Sodium**	11.4	500	**36,900**	
200.8	06/12/12	200.8	06/15/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/12/12	6010C	06/15/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-2-0612
SAMPLE

Lab Sample ID: UX80C
LIMS ID: 12-10469
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/12/12	6010C	06/15/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/12/12	200.8	06/15/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/12/12	200.8	06/18/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/12/12	6010C	06/15/12	**7440-39-3**	**Barium**	1.33	3	**343**	
3010A	06/12/12	6010C	06/15/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/12/12	6010C	06/15/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/12/12	6010C	06/15/12	**7440-70-2**	**Calcium**	11.3	50	**118,000**	
3010A	06/12/12	6010C	06/15/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/12/12	6010C	06/15/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/12/12	6010C	06/15/12	**7439-89-6**	**Iron**	7.5	50	**70**	
200.8	06/12/12	200.8	06/15/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/12/12	6010C	06/15/12	**7439-95-4**	**Magnesium**	9.6	50	**69,600**	
3010A	06/12/12	6010C	06/15/12	**7439-96-5**	**Manganese**	0.28	1	**213**	
3010A	06/12/12	6010C	06/15/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/12/12	6010C	06/15/12	**7440-09-7**	**Potassium**	65.7	500	**3,730**	
200.8	06/12/12	200.8	06/15/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/12/12	6010C	06/15/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/12/12	6010C	06/15/12	**7440-23-5**	**Sodium**	11.4	500	**20,100**	
200.8	06/12/12	200.8	06/15/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/12/12	6010C	06/15/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-0612
MATRIX SPIKE

Lab Sample ID: UX80A
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Aluminum	6010C	50.0 U	2,030	2,000	102%	
Antimony	200.8	0.200 U	23.5	25.0	94.0%	
Arsenic	200.8	2.30	28.3	25.0	104%	
Barium	6010C	478	2,510	2,000	102%	
Beryllium	6010C	1.00 U	493	500	98.6%	
Cadmium	6010C	2.00 U	520	500	104%	
Calcium	6010C	54,800	65,300	10,000	105%	H
Chromium	6010C	5.00 U	515	500	103%	
Cobalt	6010C	3.00 U	497	500	99.4%	
Copper	6010C	2.00 U	513	500	103%	
Iron	6010C	1,270	3,280	2,000	100%	
Lead	200.8	0.100 U	26.7	25.0	107%	
Magnesium	6010C	25,400	34,400	10,000	90.0%	
Manganese	6010C	169	672	500	101%	
Nickel	6010C	10.0 U	494	500	98.8%	
Potassium	6010C	2,950	13,600	10,000	106%	
Selenium	200.8	0.500 U	76.8	80.0	96.0%	
Silver	6010C	3.00 U	527	500	105%	
Sodium	6010C	36,500	46,300	10,000	98.0%	
Thallium	200.8	0.200 U	25.1	25.0	100%	
Vanadium	6010C	3.00 U	518	500	104%	
Zinc	6010C	10.0 U	488	500	97.6%	

Reported in µg/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked
NR-Not Recovered

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-0612
DUPLICATE

Lab Sample ID: UX80A
LIMS ID: 12-10467
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Aluminum	6010C	50 U	50 U	0.0%	+/- 50	L
Antimony	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Arsenic	200.8	2.3	2.3	0.0%	+/- 20%	
Barium	6010C	478	488	2.1%	+/- 20%	
Beryllium	6010C	1 U	1 U	0.0%	+/- 1	L
Cadmium	6010C	2 U	2 U	0.0%	+/- 2	L
Calcium	6010C	54,800	55,900	2.0%	+/- 20%	
Chromium	6010C	5 U	5 U	0.0%	+/- 5	L
Cobalt	6010C	3 U	3 U	0.0%	+/- 3	L
Copper	6010C	2 U	2 U	0.0%	+/- 2	L
Iron	6010C	1,270	1,300	2.3%	+/- 20%	
Lead	200.8	0.1 U	0.1 U	0.0%	+/- 0.1	L
Magnesium	6010C	25,400	25,800	1.6%	+/- 20%	
Manganese	6010C	169	171	1.2%	+/- 20%	
Nickel	6010C	10 U	10 U	0.0%	+/- 10	L
Potassium	6010C	2,950	3,010	2.0%	+/- 20%	
Selenium	200.8	0.5 U	0.5 U	0.0%	+/- 0.5	L
Silver	6010C	3 U	3 U	0.0%	+/- 3	L
Sodium	6010C	36,500	37,100	1.6%	+/- 20%	
Thallium	200.8	0.2 U	0.2 U	0.0%	+/- 0.2	L
Vanadium	6010C	3 U	3 U	0.0%	+/- 3	L
Zinc	6010C	10 U	10 U	0.0%	+/- 10	L

Reported in µg/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: UX80LCS
LIMS ID: 12-10468
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Aluminum	6010C	2030	2000	102%	
Antimony	200.8	24.2	25.0	96.8%	
Arsenic	200.8	26.0	25.0	104%	
Barium	6010C	2050	2000	102%	
Beryllium	6010C	496	500	99.2%	
Cadmium	6010C	513	500	103%	
Calcium	6010C	10000	10000	100%	
Chromium	6010C	522	500	104%	
Cobalt	6010C	502	500	100%	
Copper	6010C	507	500	101%	
Iron	6010C	2060	2000	103%	
Lead	200.8	27.1	25.0	108%	
Magnesium	6010C	10400	10000	104%	
Manganese	6010C	486	500	97.2%	
Nickel	6010C	506	500	101%	
Potassium	6010C	10200	10000	102%	
Selenium	200.8	80.3	80.0	100%	
Silver	6010C	520	500	104%	
Sodium	6010C	9530	10000	95.3%	
Thallium	200.8	25.5	25.0	102%	
Vanadium	6010C	511	500	102%	
Zinc	6010C	498	500	99.6%	

Reported in µg/L

N-Control limit not met
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: UX80MB
LIMS ID: 12-10468
Matrix: Water
Data Release Authorized:
Reported: 06/19/12

QC Report No: UX80-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: NA
Date Received: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3010A	06/12/12	6010C	06/15/12	7429-90-5	Aluminum	7.6	50	50	U
200.8	06/12/12	200.8	06/15/12	7440-36-0	Antimony	0.010	0.2	0.2	U
200.8	06/12/12	200.8	06/18/12	7440-38-2	Arsenic	0.048	0.2	0.2	U
3010A	06/12/12	6010C	06/15/12	7440-39-3	Barium	1.33	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-41-7	Beryllium	0.16	1	1	U
3010A	06/12/12	6010C	06/15/12	7440-43-9	Cadmium	0.18	2	2	U
3010A	06/12/12	6010C	06/15/12	7440-70-2	Calcium	11.3	50	50	U
3010A	06/12/12	6010C	06/15/12	7440-47-3	Chromium	1.24	5	5	U
3010A	06/12/12	6010C	06/15/12	7440-48-4	Cobalt	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-50-8	Copper	0.92	2	2	U
3010A	06/12/12	6010C	06/15/12	7439-89-6	Iron	7.5	50	50	U
200.8	06/12/12	200.8	06/15/12	7439-92-1	Lead	0.046	0.1	0.1	U
3010A	06/12/12	6010C	06/15/12	7439-95-4	Magnesium	9.6	50	50	U
3010A	06/12/12	6010C	06/15/12	7439-96-5	Manganese	0.28	1	1	U
3010A	06/12/12	6010C	06/15/12	7440-02-0	Nickel	3.9	10	10	U
3010A	06/12/12	6010C	06/15/12	7440-09-7	Potassium	65.7	500	500	U
200.8	06/12/12	200.8	06/15/12	7782-49-2	Selenium	0.127	0.5	0.5	U
3010A	06/12/12	6010C	06/15/12	7440-22-4	Silver	0.43	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-23-5	Sodium	11.4	500	500	U
200.8	06/12/12	200.8	06/15/12	7440-28-0	Thallium	0.004	0.2	0.2	U
3010A	06/12/12	6010C	06/15/12	7440-62-2	Vanadium	0.27	3	3	U
3010A	06/12/12	6010C	06/15/12	7440-66-6	Zinc	1.4	10	10	U

Reported in ug/L (ppb).
U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Aluminum	AL	ICP	IP061571	2000.0	2019.86	**101.0**	2000.0	2046.26	**102.3**	1995.38	**99.8**	2047.22	**102.4**	2007.65	**100.4**	1993.00	**99.7**
Antimony	SB	PMS	MS061511	50.0	49.91	**99.8**	50.0	49.36	**98.7**	48.73	**97.5**	46.66	**93.3**	45.43	**90.9**		
Barium	BA	ICP	IP061571	1000.0	1017.45	**101.7**	1000.0	1011.45	**101.1**	1006.43	**100.6**	1026.67	**102.7**	1015.14	**101.5**	1013.38	**101.3**
Beryllium	BE	ICP	IP061571	1000.0	976.78	**97.7**	1000.0	974.52	**97.5**	981.29	**98.1**	991.85	**99.2**	982.03	**98.2**	983.61	**98.4**
Cadmium	CD	ICP	IP061571	1000.0	1018.42	**101.8**	1000.0	1024.10	**102.4**	1005.55	**100.6**	1033.30	**103.3**	1031.35	**103.1**	1024.37	**102.4**
Calcium	CA	ICP	IP061571	2000.0	2052.65	**102.6**	2000.0	2069.76	**103.5**	2038.27	**101.9**	2223.36	**111.2**	2075.45	**103.8**	2086.92	**104.3**
Chromium	CR	ICP	IP061571	1000.0	1015.89	**101.6**	1000.0	1012.74	**101.3**	1009.03	**100.9**	1035.17	**103.5**	1021.06	**102.1**	1024.06	**102.4**
Cobalt	CO	ICP	IP061571	1000.0	989.57	**99.0**	1000.0	995.66	**99.6**	982.92	**98.3**	1012.73	**101.3**	1007.28	**100.7**	1005.08	**100.5**
Copper	CU	ICP	IP061571	1000.0	1012.42	**101.2**	1000.0	1017.00	**101.7**	988.21	**98.8**	1024.03	**102.4**	1021.79	**102.2**	1016.25	**101.6**
Iron	FE	ICP	IP061571	2000.0	2061.21	**103.1**	2000.0	2082.01	**104.1**	2037.94	**101.9**	2111.36	**105.6**	2063.14	**103.2**	2062.07	**103.1**
Lead	PB	PMS	MS061511	50.0	51.33	**102.7**	50.0	49.77	**99.5**	50.15	**100.3**	50.99	**102.0**	51.41	**102.8**		
Magnesium	MG	ICP	IP061571	2000.0	2009.30	**100.5**	2000.0	2022.30	**101.1**	1991.18	**99.6**	2060.75	**103.0**	2021.67	**101.1**	2026.47	**101.3**
Manganese	MN	ICP	IP061571	1000.0	974.72	**97.5**	1000.0	974.54	**97.5**	976.59	**97.7**	989.69	**99.0**	978.30	**97.8**	978.01	**97.8**
Nickel	NI	ICP	IP061571	1000.0	1001.35	**100.1**	1000.0	995.21	**99.5**	992.55	**99.3**	1015.89	**101.6**	999.43	**99.9**	1001.81	**100.2**
Potassium	K	ICP	IP061571	20000.0	20410.97	**102.1**	20000.0	20425.99	**102.1**	20553.48	**102.8**	20625.62	**103.1**	20512.68	**102.6**	20466.51	**102.3**
Selenium	SE	PMS	MS061511	80.0	80.60	**100.8**	50.0	49.99	**100.0**	52.12	**104.2**	51.11	**102.2**	49.55	**99.1**		
Silver	AG	ICP	IP061571	1000.0	1030.91	**103.1**	1000.0	1021.36	**102.1**	994.00	**99.4**	1028.79	**102.9**	1023.82	**102.4**	1017.04	**101.7**
Sodium	NA	ICP	IP061571	50000.0	49604.72	**99.2**	50000.0	48956.58	**97.9**	48511.95	**97.0**	47975.23	**96.0**	47658.67	**95.3**	47176.62	**94.4**
Thallium	TL	PMS	MS061511	50.0	48.29	**96.6**	50.0	47.46	**94.9**	47.44	**94.9**	48.03	**96.1**	48.42	**96.8**		
Vanadium	V	ICP	IP061571	1000.0	1015.10	**101.5**	1000.0	1021.30	**102.1**	992.78	**99.3**	1035.54	**103.6**	1028.29	**102.8**	1024.28	**102.4**
Zinc	ZN	ICP	IP061571	1000.0	1031.79	**103.2**	1000.0	1032.62	**103.3**	1020.27	**102.0**	1062.13	**106.2**	1042.47	**104.2**	1046.40	**104.6**

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Aluminum	AL	ICP	IP061571	2000.0	2027.19	**101.4**										
Antimony	SB	PMS	MS061511	50.0												
Barium	BA	ICP	IP061571	1000.0	1009.24	**100.9**										
Beryllium	BE	ICP	IP061571	1000.0	971.49	**97.1**										
Cadmium	CD	ICP	IP061571	1000.0	1012.66	**101.3**										
Calcium	CA	ICP	IP061571	2000.0	2094.09	**104.7**										
Chromium	CR	ICP	IP061571	1000.0	1019.76	**102.0**										
Cobalt	CO	ICP	IP061571	1000.0	997.39	**99.7**										
Copper	CU	ICP	IP061571	1000.0	1007.35	**100.7**										
Iron	FE	ICP	IP061571	2000.0	2088.61	**104.4**										
Lead	PB	PMS	MS061511	50.0												
Magnesium	MG	ICP	IP061571	2000.0	2038.49	**101.9**										
Manganese	MN	ICP	IP061571	1000.0	964.73	**96.5**										
Nickel	NI	ICP	IP061571	1000.0	998.57	**99.9**										
Potassium	K	ICP	IP061571	20000.0	20300.39	**101.5**										
Selenium	SE	PMS	MS061511	50.0												
Silver	AG	ICP	IP061571	1000.0	1009.13	**100.9**										
Sodium	NA	ICP	IP061571	50000.0	46438.42	**92.9**										
Thallium	TL	PMS	MS061511	50.0												
Vanadium	V	ICP	IP061571	1000.0	1016.72	**101.7**										
Zinc	ZN	ICP	IP061571	1000.0	1045.26	**104.5**										

UX80 : 00076

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Arsenic	AS	PMS	MS061881	50.0	50.46	**100.9**	50.0	50.04	**100.1**	49.61	**99.2**	49.64	**99.3**	49.76	**99.5**	50.42	**100.8**

UX80:00071

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Arsenic	AS	PMS	MS061881	50.0	50.41	100.8	49.43	98.9	49.06	98.1	49.88	99.8	50.07	100.1	50.60	101.2

UX80 : 00072

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Aluminum	AL	ICP	IP061571	50.0	52.34	**104.7**	61.36	**122.7**								
Antimony	SB	PMS	MS061511	0.2	0.21	**105.0**										
Barium	BA	ICP	IP061571	3.0	2.40	**80.0**	2.61	**87.0**								
Beryllium	BE	ICP	IP061571	1.0	1.02	**102.0**	0.93	**93.0**								
Cadmium	CD	ICP	IP061571	2.0	2.29	**114.5**	2.17	**108.5**								
Calcium	CA	ICP	IP061571	50.0	48.37	**96.7**	50.23	**100.5**								
Chromium	CR	ICP	IP061571	5.0	5.05	**101.0**	5.80	**116.0**								
Cobalt	CO	ICP	IP061571	3.0	3.56	**118.7**	3.41	**113.7**								
Copper	CU	ICP	IP061571	2.0	2.25	**112.5**	2.53	**126.5**								
Iron	FE	ICP	IP061571	50.0	55.42	**110.8**	56.73	**113.5**								
Lead	PB	PMS	MS061511	0.1	0.11	**110.0**										
Magnesium	MG	ICP	IP061571	50.0	50.58	**101.2**	47.93	**95.9**								
Manganese	MN	ICP	IP061571	1.0	1.11	**111.0**	1.07	**107.0**								
Nickel	NI	ICP	IP061571	10.0	10.57	**105.7**	12.22	**122.2**								
Potassium	K	ICP	IP061571	500.0	513.74	**102.7**	516.17	**103.2**								
Selenium	SE	PMS	MS061511	0.5	0.49	**98.0**										
Silver	AG	ICP	IP061571	3.0	3.32	**110.7**	3.21	**107.0**								
Sodium	NA	ICP	IP061571	500.0	493.77	**98.8**	475.47	**95.1**								
Thallium	TL	PMS	MS061511	0.2	0.20	**100.0**										
Vanadium	V	ICP	IP061571	3.0	2.97	**99.0**	3.01	**100.3**								
Zinc	ZN	ICP	IP061571	10.0	9.89	**98.9**	10.10	**101.0**								

UX80 : 00573

Control Limits: no control limits have been established by the EPA at this time.

CRDL Standard

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

ANALYTICAL RESOURCES INCORPORATED

UNITS: ug/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Arsenic	AS	PMS	MS061881		0.2	0.20	**100.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Aluminum	AL	ICP	IP061571	200.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Antimony	SB	PMS	MS061511	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Barium	BA	ICP	IP061571	200.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Beryllium	BE	ICP	IP061571	5.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	CD	ICP	IP061571	5.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Calcium	CA	ICP	IP061571	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Chromium	CR	ICP	IP061571	10.0	5.0	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U	5.0	U
Cobalt	CO	ICP	IP061571	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Copper	CU	ICP	IP061571	25.0	2.0	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U
Iron	FE	ICP	IP061571	100.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Lead	PB	PMS	MS061511	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U		
Magnesium	MG	ICP	IP061571	5000.0	50.0	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U	50.0	U
Manganese	MN	ICP	IP061571	15.0	1.0	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U
Nickel	NI	ICP	IP061571	40.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U
Potassium	K	ICP	IP061571	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Selenium	SE	PMS	MS061511	5.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U		
Silver	AG	ICP	IP061571	10.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Sodium	NA	ICP	IP061571	5000.0	500.0	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U	500.0	U
Thallium	TL	PMS	MS061511	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U		
Vanadium	V	ICP	IP061571	50.0	3.0	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U
Zinc	ZN	ICP	IP061571	20.0	10.0	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

UX80:00075

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Aluminum	AL	ICP	IP061571	200.0	50.0	50.0	U										
Antimony	SB	PMS	MS061511	60.0	0.2												
Barium	BA	ICP	IP061571	200.0	3.0	3.0	U										
Beryllium	BE	ICP	IP061571	5.0	1.0	1.0	U										
Cadmium	CD	ICP	IP061571	5.0	2.0	2.0	U										
Calcium	CA	ICP	IP061571	5000.0	50.0	50.0	U										
Chromium	CR	ICP	IP061571	10.0	5.0	5.0	U										
Cobalt	CO	ICP	IP061571	50.0	3.0	3.0	U										
Copper	CU	ICP	IP061571	25.0	2.0	2.0	U										
Iron	FE	ICP	IP061571	100.0	50.0	50.0	U										
Lead	PB	PMS	MS061511	3.0	0.1												
Magnesium	MG	ICP	IP061571	5000.0	50.0	50.0	U										
Manganese	MN	ICP	IP061571	15.0	1.0	1.0	U										
Nickel	NI	ICP	IP061571	40.0	10.0	10.0	U										
Potassium	K	ICP	IP061571	5000.0	500.0	500.0	U										
Selenium	SE	PMS	MS061511	5.0	0.5												
Silver	AG	ICP	IP061571	10.0	3.0	3.0	U										
Sodium	NA	ICP	IP061571	5000.0	500.0	500.0	U										
Thallium	TL	PMS	MS061511	10.0	0.2												
Vanadium	V	ICP	IP061571	50.0	3.0	3.0	U										
Zinc	ZN	ICP	IP061571	20.0	10.0	10.0	U										

UX80 : 00076

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Arsenic	AS	PMS	MS061881	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Arsenic	AS	PMS	MS061881	10.0	0.2	0.2	U	0.2	U	0.2	U	0.3	B	0.2	U	0.2	U

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg

RUNID: IP061571

SDG: UX80

INSTRUMENT ID: OPTIMA ICP 2

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	200000	200000	199198.8	200259.9	**100.1**	198910.4	198923.7	**99.5**			
Antimony		1000	41.3	1057.7	**105.8**	40.2	1058.0	**105.8**			
Arsenic		1000	7.5	1002.6	**100.3**	11.2	1006.6	**100.7**			
Barium		1000	-1.6	1010.2	**101.0**	-1.5	1001.4	**100.1**			
Beryllium		1000	0.0	989.5	**99.0**	0.0	985.2	**98.5**			
Boron			-1.1	4.0		0.9	3.1				
Cadmium		1000	1.2	1007.3	**100.7**	1.0	1019.2	**101.9**			
Calcium	100000	100000	100864.9	101223.9	**101.2**	101238.3	101005.2	**101.0**			
Chromium		1000	-1.1	1020.8	**102.1**	-1.0	1015.0	**101.5**			
Cobalt		1000	1.9	942.7	**94.3**	1.7	958.8	**95.9**			
Copper		1000	-0.4	996.7	**99.7**	0.2	1028.9	**102.9**			
Iron	200000	200000	197232.8	197893.6	**98.9**	197606.1	197433.3	**98.7**			
Lead		1000	-10.9	981.6	**98.2**	-11.2	980.5	**98.1**			
Magnesium	100000	100000	102643.4	98396.2	**98.4**	102349.8	98292.6	**98.3**			
Manganese		1000	0.6	955.1	**95.5**	0.6	951.6	**95.2**			
Molybdenum			1.5	0.9		1.1	1.5				
Nickel		1000	-2.2	960.2	**96.0**	-3.0	955.7	**95.6**			
Potassium			46.9	384.9		53.2	395.2				
Selenium		1000	23.8	1011.8	**101.2**	28.1	1021.8	**102.2**			
Silicon			-13.8	-12.8		-8.5	-8.5				
Silver		1000	-0.4	1003.6	**100.4**	-0.3	1030.0	**103.0**			
Sodium			9.5	18.6		20.6	25.1				
Strontium			3.9	3.9		3.9	3.9				
Thallium		1000	-3.8	914.5	**91.5**	-2.3	912.5	**91.3**			
Tin			-0.4	-0.3		-0.5	-1.3				
Titanium			-0.2	0.0		-0.5	-1.2				
Vanadium		1000	0.2	972.4	**97.2**	-0.4	998.7	**99.9**			
Zinc		1000	2.5	968.0	**96.8**	2.0	968.0	**96.8**			

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

ICS SOURCE: I.V.

RUNID: MS061511

INSTRUMENT ID: NEXION 300D

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Aluminum	20000	20000	21049.1	21893.6	**109.5**						
Antimony			0.1	0.1							
Arsenic		20	0.0	17.1	**85.5**						
Cadmium		20	0.2	19.4	**97.0**						
Calcium	20000	20000	20508.3	20300.9	**101.5**						
Chromium		20	0.8	19.9	**99.5**						
Cobalt		20	0.0	19.0	**95.0**						
Copper		20	0.9	20.5	**102.5**						
Iron	20000	20000	20744.3	19675.1	**98.4**						
Magnesium	20000	20000	21400.5	22064.4	**110.3**						
Manganese		20	0.1	19.2	**96.0**						
Molybdenum	400	400	423.2	419.2	**104.8**						
Nickel		20	0.3	20.5	**102.5**						
Potassium	20000	20000	0.0	25224.9	**126.1**						
Selenium			-0.3	-0.2							
Silver		20	0.0	18.9	**94.5**						
Sodium	20000	20000	21980.5	22713.6	**113.6**						
Thorium			0.1	0.1							
Vanadium			0.1	0.2							
Zinc		20	0.7	19.8	**99.0**						

UX80 - 00000

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

ICS SOURCE: I.V.

PROJECT: Landsburg

RUNID: MS061881

SDG: UX80

INSTRUMENT ID: PE ELAN 6000

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Arsenic		20	0.0	19.7	**98.5**						
Cadmium		20	0.1	19.9	**99.5**						
Chromium		20	0.8	21.2	**106.0**						
Cobalt		20	0.0	19.9	**99.5**						
Copper		20	0.5	20.0	**100.0**						
Manganese		20	0.1	20.3	**101.5**						
Molybdenum	400	400	398.9	394.6	**98.7**						
Nickel		20	0.6	20.3	**101.5**						
Selenium			-0.1	-0.1							
Silver		20	0.0	19.9	**99.5**						
Vanadium			0.0	-0.5							
Zinc		20	0.8	19.6	**98.0**						

UX80 : 00031

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

ANALYSIS METHOD: ICP

SDG: UX80

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Aluminum	LMW-7-0612L	UX80A-L	Water	IP061571	50.00	U	250.00	U		
Barium	LMW-7-0612L	UX80A-L	Water	IP061571	477.53		484.25	B	1.4	
Beryllium	LMW-7-0612L	UX80A-L	Water	IP061571	1.00	U	5.00	U		
Cadmium	LMW-7-0612L	UX80A-L	Water	IP061571	2.00	U	10.00	U		
Calcium	LMW-7-0612L	UX80A-L	Water	IP061571	54824.59		55183.35		0.7	
Chromium	LMW-7-0612L	UX80A-L	Water	IP061571	5.00	U	25.00	U		
Cobalt	LMW-7-0612L	UX80A-L	Water	IP061571	3.00	U	15.00	U		
Copper	LMW-7-0612L	UX80A-L	Water	IP061571	2.00	U	10.00	U		
Iron	LMW-7-0612L	UX80A-L	Water	IP061571	1267.45		1325.60		4.6	
Magnesium	LMW-7-0612L	UX80A-L	Water	IP061571	25405.15		25377.10		0.1	
Manganese	LMW-7-0612L	UX80A-L	Water	IP061571	168.52		176.85		4.9	
Nickel	LMW-7-0612L	UX80A-L	Water	IP061571	10.00	U	50.00	U		
Potassium	LMW-7-0612L	UX80A-L	Water	IP061571	2947.47	B	3070.00	B	4.2	
Silver	LMW-7-0612L	UX80A-L	Water	IP061571	3.00	U	15.00	U		
Sodium	LMW-7-0612L	UX80A-L	Water	IP061571	36510.41		36758.40		0.7	
Vanadium	LMW-7-0612L	UX80A-L	Water	IP061571	3.00	U	15.00	U		
Zinc	LMW-7-0612L	UX80A-L	Water	IP061571	10.00	U	50.00	U		

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

ANALYSIS METHOD: PMS

SDG: UX80

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Antimony	LMW-7-0612L	UX80A-L	Water	MS061511	0.01	U	0.05	B		
Lead	LMW-7-0612L	UX80A-L	Water	MS061511	0.01	U	0.05	B		
Selenium	LMW-7-0612L	UX80A-L	Water	MS061511	0.10	U	0.00	B		
Thallium	LMW-7-0612L	UX80A-L	Water	MS061511	0.02	U	0.05	B		
Antimony	LMW-7-0612L	UX80A-L	Water	MS061881	0.01	U	0.05	B		
Arsenic	LMW-7-0612L	UX80A-L	Water	MS061881	2.30	B	2.60	B	13.0	

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Aluminum	AL	ICP	OPTIMA ICP 2	308.22		200	50.0	4/1/2011	250000.0	3/19/2012
Antimony	SB	PMS	NEXION 300D MS	0.00		60	0.2	4/1/2011		
Arsenic	AS	PMS	PE ELAN 6000 MS	0.00		10	0.2	4/1/2011		
Barium	BA	ICP	OPTIMA ICP 2	455.50		200	3.0	4/1/2011	100000.0	3/19/2012
Beryllium	BE	ICP	OPTIMA ICP 2	313.04		5	1.0	4/1/2011	5000.0	3/19/2012
Cadmium	CD	ICP	OPTIMA ICP 2	228.80		5	2.0	4/1/2011	20000.0	3/19/2012
Calcium	CA	ICP	OPTIMA ICP 2	317.93		5000	50.0	4/1/2011	500000.0	3/19/2012
Chromium	CR	ICP	OPTIMA ICP 2	267.72		10	5.0	4/1/2011	100000.0	3/19/2012
Cobalt	CO	ICP	OPTIMA ICP 2	228.62		50	3.0	4/1/2011	80000.0	3/19/2012
Copper	CU	ICP	OPTIMA ICP 2	324.75		25	2.0	4/1/2011	40000.0	3/19/2012
Iron	FE	ICP	OPTIMA ICP 2	259.94		100	50.0	4/1/2011	250000.0	3/19/2012
Lead	PB	PMS	NEXION 300D MS	0.00		3	0.1	4/1/2011		
Magnesium	MG	ICP	OPTIMA ICP 2	279.08		5000	50.0	4/1/2011	500000.0	3/19/2012
Manganese	MN	ICP	OPTIMA ICP 2	257.61		15	1.0	4/1/2011	30000.0	3/19/2012
Nickel	NI	ICP	OPTIMA ICP 2	231.60		40	10.0	4/1/2011	100000.0	3/19/2012
Potassium	K	ICP	OPTIMA ICP 2	766.49		5000	500.0	4/1/2011	500000.0	3/19/2012
Selenium	SE	PMS	NEXION 300D MS	0.00		5	0.5	4/1/2011		
Silver	AG	ICP	OPTIMA ICP 2	328.07		10	3.0	4/1/2011	5000.0	3/19/2012
Sodium	NA	ICP	OPTIMA ICP 2	589.00		5000	500.0	4/1/2011	5000000.0	3/19/2012
Thallium	TL	PMS	NEXION 300D MS	0.00		10	0.2	4/1/2011		
Vanadium	V	ICP	OPTIMA ICP 2	292.40		50	3.0	4/1/2011	50000.0	3/19/2012
Zinc	ZN	ICP	OPTIMA ICP 2	213.86		20	10.0	4/1/2011	100000.0	3/19/2012

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

IEC DATE: 6/1/2012

SDG: UX80

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	AL	AS	BA	BE	CA	CD	CO	CR	CU	FE
Aluminum	308.22	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.84	0.2288210	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	10.2020000	0.0000000	0.0000000
Arsenic	188.98	0.0000000	0.0000000	0.0000000	0.0000000	0.0465308	0.0000000	-0.9907570	1.0929900	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.1617070	0.0000000	0.0000000	0.0914952
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	228.80	0.0000000	3.4090200	0.0000000	0.0000000	0.0000000	0.0000000	0.1642300	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0409619	0.0000000	0.0000000	-0.0368378
Cobalt	228.62	0.0000000	0.0000000	0.2151410	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.2203550	-0.0248240	0.0000000	-0.0823241
Iron	273.96	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.7214060	0.0000000	0.0000000
Lead	220.35	-0.1513300	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-2.0199800	1.2549900	0.0691628
Magnesium	279.08	0.0000000	0.0000000	0.0000000	0.0000000	0.2031830	0.0000000	-1.7927700	-1.2197100	0.0000000	0.8351330
Manganese	257.61	0.0055064	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.0067944
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0114978	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	288.16	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-3.7375200	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	4.3564800	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	0.0000000	0.0000000	0.0691410	0.0000000	2.5520300	0.3828500	0.0000000	-0.1753480
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0309095	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	0.0000000	0.0000000	0.0767423	0.0000000	0.0000000	0.2207060	0.0000000	0.0000000
Vanadium	292.40	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-4.2513600	0.0000000	0.1121590
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.4942180	0.0000000	0.0000000

UX80:00085

ICP Interelement Correction Factors

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

IEC DATE: 6/1/2012

SDG: UX80

INSTRUMENT ID: OPTIMA ICP 2

ANALYTE	WAVELENGTH	MG	MN	MO	NI	PB	SB	TI	TL	V	ZN
Aluminum	308.22	0.0000000	0.0000000	8.7251100	0.0000000	0.0000000	0.0000000	1.2350800	0.0000000	19.6337000	0.0000000
Antimony	206.84	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-1.6262000	0.0000000	-2.0479800	0.0000000
Arsenic	188.98	0.0000000	0.0000000	1.4466600	0.0000000	0.0000000	0.0000000	-6.9568100	0.0000000	0.0000000	0.0000000
Barium	233.53	0.0000000	0.0000000	0.0000000	0.0777109	0.0000000	0.0000000	0.0000000	0.0000000	0.4101220	0.0000000
Beryllium	313.04	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0114175	0.0000000	0.6735850	0.0000000
Cadmium	228.80	0.0000000	0.0000000	0.0576937	-0.6515750	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Calcium	317.93	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Chromium	267.72	0.0358408	0.0000000	0.1461890	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.2854520	0.0267072
Cobalt	228.62	0.0000000	0.0000000	-0.2518640	0.1618730	0.0000000	0.0000000	1.6854600	0.0000000	0.0000000	0.0000000
Copper	324.75	0.0000000	0.0000000	0.1890580	0.0000000	0.0000000	0.0000000	0.2839350	0.0000000	0.0000000	0.0000000
Iron	273.96	0.1014670	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	5.2682800	0.0000000
Lead	220.35	0.0000000	0.0000000	-0.3516970	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Magnesium	279.08	0.0000000	0.0000000	-3.2487800	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0040374	0.0000000	0.0000000	0.0000000	-0.3367650	0.0000000	0.0000000	0.0000000	-0.0331334	0.0000000
Molybdenum	202.03	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	-0.9494270	0.0000000	0.0000000	0.0000000	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.03	0.0000000	0.9119740	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silicon	288.16	-0.1314600	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Silver	328.07	0.0000000	0.2105810	0.1262930	0.0000000	0.0000000	0.0000000	-0.0406459	0.0000000	-0.2398130	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	271.7310000	0.0000000	0.0000000	373.0000000
Thallium	190.80	0.0000000	0.0000000	-3.8706100	0.0000000	0.0917790	0.0000000	0.5514110	0.0000000	1.6549500	0.0000000
Tin	189.93	0.0000000	0.0000000	0.0000000	0.0000000	-0.0344764	-0.7123520	-0.4958940	0.0000000	0.0000000	0.0000000
Titanium	334.90	0.0000000	0.0000000	1.3260700	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Vanadium	292.40	0.0000000	-0.1562030	-0.7955440	0.0000000	0.0000000	0.0000000	0.6246810	0.0000000	0.0000000	0.0000000
Zinc	206.20	0.0000000	0.0000000	0.2669400	0.0000000	-0.1628880	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

UX80 : 00085

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

ANALYSIS METHOD: ICP

ARI PREP CODE: TWC

PREPDATE: 6/12/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-7-0612	UX80A	0.000	50.0	50.0
LMW-7-0612D	UX80ADUP	0.000	50.0	50.0
LMW-7-0612S	UX80ASPK	0.000	50.0	50.0
LMW-7-0612-D	UX80B	0.000	50.0	50.0
LMW-2-0612	UX80C	0.000	50.0	50.0
PBW	UX80MB1	0.000	50.0	50.0
LCSW	UX80MB1SPK	0.000	50.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX80

ANALYSIS METHOD: PMS

ARI PREP CODE: REN

PREPDATE: 6/12/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-7-0612	UX80A	0.000	50.0	25.0
LMW-7-0612D	UX80ADUP	0.000	50.0	25.0
LMW-7-0612S	UX80ASPK	0.000	50.0	25.0
LMW-7-0612-D	UX80B	0.000	50.0	25.0
LMW-2-0612	UX80C	0.000	50.0	25.0
PBW	UX80MB1	0.000	50.0	25.0
LCSW	UX80MB1SPK	0.000	50.0	25.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 6/15/2012

SDG: UX80 | RUNID: IP061571 | METHOD: ICP | END DATE: 6/15/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	10282		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
S2	S2	1.00	10324						X			X	X	X	X					X												X	
S3	S3	1.00	10342		X					X													X										X
S4	S4	1.00	10370																														
S5	S5	1.00	10391			X					X					X		X	X			X											
ICV	ICV	1.00	11013		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICB	ICB	1.00	11044		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRII	1.00	11090		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAI	1.00	11131		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABI	1.00	11171		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV1	1.00	11210		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB1	1.00	11241		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
PBW	UX80MB1	1.00	11283		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	UX35MB1	2.00	11324																														
LMW-7-0612L	UX80A-L	5.00	11370		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-7-0612	UX80A	1.00	11411		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-7-0612D	UX80ADUP	1.00	11452		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-7-0612S	UX80ASPK	1.00	11494		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	ZZZZZZ	1.00	11525																														
LMW-7-0612-D	UX80B	1.00	11561		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	UX35MB1SPK	2.00	12002																														
LCSW	UX80MB1SPK	1.00	12042		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV2	1.00	12082		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB2	1.00	12112		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-2-0612	UX80C	1.00	12154																														
ZZZZZZ	UX35A-L	10.00	12195																														
ZZZZZZ	UX35A	2.00	12235																														
ZZZZZZ	UX35ADUP	2.00	12270																														
ZZZZZZ	UX35ASPK	2.00	12310																														
ZZZZZZ	UX35APOST	2.00	12332																														
ZZZZZZ	UX35B	2.00	12354																														
ZZZZZZ	UX35C	2.00	12400																														
CCV	CCV3	1.00	12443		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB3	1.00	12475		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV4	1.00	13070		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

FORM XIV

UX80 : 00089

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: OPTIMA ICP 2 | START DATE: 6/15/2012

SDG: UX80 | RUNID: IP061571 | METHOD: ICP | END DATE: 6/15/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB4	1.00	13102		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
LMW-2-0612	UX80C	1.00	13143		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ZZZZZZ	UX35B	5.00	13185																														
ZZZZZZ	UX35C	5.00	13230																														
ZZZZZZ	D1	1.00	13272																														
CCV	CCV5	1.00	13313		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB5	1.00	13345		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CRI	CRIF	1.00	13391		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSA	ICSAF	1.00	13432		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
ICSAB	ICSABF	1.00	13472		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCV	CCV6	1.00	13512		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X
CCB	CCB6	1.00	13544		X	X			X	X	X	X	X	X	X	X		X	X	X		X	X									X	X

UX80 : 00000

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: NEXION 300D MS | START DATE: 6/15/2012

SDG: UX80 | RUNID: MS061511 | METHOD: PMS | END DATE: 6/15/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	09280																					X	X	X				X			
S1	S1	1.00	09320																					X	X	X				X			
S2	S2	1.00	09360																					X	X	X				X			
S3	S3	1.00	09410																					X	X	X				X			
S4	S4	1.00	09460																					X	X	X				X			
S5	S5	1.00	09510																														
ZZZZZZ	Rinse sampl	1.00	09570																														
ICV	MICV	1.00	10020																					X	X	X				X			
ICB	ICB	1.00	10090																					X	X	X				X			
CCV	MCCV1	1.00	10140																					X	X	X				X			
CCB	CCB1	1.00	10210																					X	X	X				X			
CRI	MCRI	1.00	10250																					X	X	X				X			
ICSA	ICSAI	1.00	10290																					X	X	X				X			
ICSAB	ICSABI	1.00	10360																					X	X	X				X			
ZZZZZZ	LR200	1.00	10430																														
ZZZZZZ	B1	1.00	10500																														
ZZZZZZ	B2	1.00	10560																														
CCV	MCCV2	1.00	11010																					X	X	X				X			
CCB	CCB2	1.00	11080																					X	X	X				X			
ZZZZZZ	MDLCKMB	2.00	11180																														
ZZZZZZ	MDLCK1	2.00	11220																														
ZZZZZZ	MDLCK2	2.00	11260																														
ZZZZZZ	MDLCK3	2.00	11310																														
ZZZZZZ	UX34A	2.00	11350																														
ZZZZZZ	UX34ADUP	2.00	11390																														
CCV	MCCV3	1.00	11450																					X	X	X				X			
CCB	CCB3	1.00	11520																					X	X	X				X			
PBW	UX80MB1	2.00	11560																					X	X	X				X			
LCSW	UX80MB1SPK	2.00	12000																					X	X	X				X			
LMW-7-0612L	UX80A-L	10.00	12050				X																	X	X	X				X			
LMW-7-0612	UX80A	2.00	12090																					X	X	X				X			
LMW-7-0612D	UX80ADUP	2.00	12130																					X	X	X				X			
LMW-7-0612S	UX80ASPK	2.00	12180																					X	X	X				X			
ZZZZZZ	ZZZZZZ	2.00	12220																														
LMW-7-0612-D	UX80B	2.00	12280																					X	X	X				X			

FORM XIV

UX80_0095T

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: NEXION 300D MS | START DATE: 6/15/2012

SDG: UX80 | RUNID: MS061511 METHOD: PMS | END DATE: 6/15/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
LMW-2-0612	UX80C	2.00	12320																					X	X	X				X			
CCV	MCCV4	1.00	12380																					X	X	X				X			
CCB	CCB4	1.00	12450																					X	X	X				X			

UX80 : 00052

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: PE ELAN 6000 MS | START DATE: 6/18/2012

SDG: UX80 | RUNID: MS061881 METHOD: PMS | END DATE: 6/18/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	11080				X																										
S1	S1	1.00	11140				X																										
S2	S2	1.00	11200				X																										
S3	S3	1.00	11260				X																										
S4	S4	1.00	11320				X																										
ZZZZZZ	Rinse Sampl	1.00	11390																														
S0	S0	1.00	11460				X																										
ICV	MICV	1.00	11520				X																										
ICB	ICB	1.00	11590				X																										
CCV	MCCV1	1.00	12050				X																										
CCB	CCB1	1.00	12110				X																										
CRI	MCRI	1.00	12170				X																										
ICSA	ICSAI	1.00	12230				X																										
ICSAB	ICSABI	1.00	12290				X																										
ZZZZZZ	LR200	1.00	12360																														
ZZZZZZ	LR300	1.00	12420																														
CCV	MCCV2	1.00	12490				X																										
CCB	CCB2	1.00	12550				X																										
ZZZZZZ	UY40MB1	20.00	13010																														
ZZZZZZ	UY37MB	2.00	13070																														
ZZZZZZ	UY37MBSPK	2.00	13130																														
ZZZZZZ	UY37A	2.00	13190																														
ZZZZZZ	UY40ADUP	100.00	13250																														
ZZZZZZ	UY40A	100.00	13320																														
ZZZZZZ	UY40ASPK	100.00	13380																														
ZZZZZZ	UY40B	100.00	13440																														
ZZZZZZ	UY40C	100.00	13510																														
ZZZZZZ	UY07A	1.00	13570																														
CCV	MCCV3	1.00	14030				X																										
CCB	CCB3	1.00	14100				X																										
PBW	UX80MB1	2.00	14180																														
LCSW	UX80MB1SPK	2.00	14240																														
ZZZZZZ	ZZZZZZ	10.00	14300																														
LMW-7-0612	UX80A	2.00	14370																														
LMW-7-0612D	UX80ADUP	2.00	14430																														

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: PE ELAN 6000 MS | START DATE: 6/18/2012

SDG: UX80 | RUNID: MS061881 METHOD: PMS | END DATE: 6/18/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
LMW-7-0612S	UX80ASPK	2.00	14490																														
ZZZZZZ	ZZZZZZ	2.00	14550																														
LMW-7-0612-D	UX80B	2.00	15020																														
LMW-2-0612	UX80C	2.00	15080																														
ZZZZZZ	UX63A	2.00	15140																														
CCV	MCCV4	1.00	15210				X																										
CCB	CCB4	1.00	15270				X																										
S0	S0	1.00	15400				X																										
CCV	MCCV5	1.00	15470				X																										
CCB	CCB5	1.00	15530				X																										
ZZZZZZ	UY37MB	2.00	15590																														
ZZZZZZ	UX65MB	2.00	16050																														
ZZZZZZ	UX63MB	2.00	16110																														
ZZZZZZ	UX63MBSPK	2.00	16170																														
ZZZZZZ	UX65MBSPK	2.00	16260																														
ZZZZZZ	UX64MBSPK	2.00	16320																														
ZZZZZZ	UX64A	2.00	16380																														
ZZZZZZ	UX65ADUP	2.00	16440																														
ZZZZZZ	UX65A	2.00	16510																														
ZZZZZZ	UX65ASPK	2.00	16570																														
CCV	MCCV6	1.00	17030				X																										
CCB	CCB6	1.00	17100				X																										
ZZZZZZ	DI CHECK	1.00	17160																														
ZZZZZZ	UY07MB	1.00	17220																														
ZZZZZZ	UY07MBSPK	1.00	17270																														
ZZZZZZ	ERAP197	10.00	17340																														
ZZZZZZ	UY07DDUP	1.00	17400																														
ZZZZZZ	UY07D	1.00	17460																														
ZZZZZZ	UY07DSPK	1.00	17530																														
ZZZZZZ	UY07B	1.00	17590																														
ZZZZZZ	UY07C	1.00	18050																														
ZZZZZZ	UY07E	1.00	18110																														
CCV	MCCV7	1.00	18180				X																										
CCB	CCB7	1.00	18240				X																										
ZZZZZZ	UY16MB1	2.00	18300																														

FORM XIV

UX80 : 60691

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: PE ELAN 6000 MS | START DATE: 6/18/2012

SDG: UX80 | RUNID: MS061881 METHOD: PMS | END DATE: 6/18/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	UY16MB2	2.00	18360																														
ZZZZZZ	UY16MB2SPK	2.00	18420																														
ZZZZZZ	UY16MB1SPK	2.00	18480																														
ZZZZZZ	UY16B	2.00	18540																														
ZZZZZZ	UY07F	1.00	19010																														
ZZZZZZ	UY07G	1.00	19070																														
ZZZZZZ	UY07H	1.00	19130																														
ZZZZZZ	UY07I	1.00	19200																														
ZZZZZZ	UY07J	1.00	19260																														
CCV	MCCV8	1.00	19320				X																										
CCB	CCB8	1.00	19390				X																										
ZZZZZZ	UY16ADUP	2.00	19450																														
ZZZZZZ	UY16A	2.00	19510																														
ZZZZZZ	UY16ASPK	2.00	19570																														
ZZZZZZ	UY16EDUP	2.00	20030																														
ZZZZZZ	UY16E	2.00	20100																														
ZZZZZZ	UY16ESPK	2.00	20160																														
ZZZZZZ	UY16C	2.00	20220																														
ZZZZZZ	UY16D	2.00	20290																														
ZZZZZZ	UY16F	2.00	20350																														
ZZZZZZ	UY16G	2.00	20410																														
CCV	MCCV9	1.00	20480				X																										
CCB	CCB9	1.00	20540				X																										
ZZZZZZ	UY31MB	2.00	21000																														
ZZZZZZ	UY31MBSPK	2.00	21060																														
ZZZZZZ	UY31FDUP	2.00	21120																														
ZZZZZZ	UY31F	2.00	21180																														
ZZZZZZ	UY31FSPK	2.00	21250																														
ZZZZZZ	UY31A	2.00	21310																														
ZZZZZZ	UY31B	2.00	21370																														
ZZZZZZ	UY31C	2.00	21430																														
ZZZZZZ	UY31E	2.00	21500																														
ZZZZZZ	UY16H	2.00	21560																														
CCV	MCCV10	1.00	22020				X																										
CCB	CCB10	1.00	22090				X																										

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: PE ELAN 6000 MS | START DATE: 6/18/2012

SDG: UX80 | RUNID: MS061881 | METHOD: PMS | END DATE: 6/18/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	UX64MB	2.00	22150																														
PBW	UX80MB1	2.00	22200				X																										
LCSW	UX80MB1SPK	2.00	22260				X																										
LMW-7-0612L	UX80A-L	10.00	22330				X																	X	X	X				X			
LMW-7-0612	UX80A	2.00	22390				X																										
LMW-7-0612D	UX80ADUP	2.00	22450				X																										
LMW-7-0612S	UX80ASPK	2.00	22510				X																										
LMW-7-0612-D	UX80B	2.00	22580				X																										
LMW-2-0612	UX80C	2.00	23040				X																										
ZZZZZZ	UX63A	2.00	23100																														
CCV	MCCV11	1.00	23170				X																										
CCB	CCB11	1.00	23230				X																										

UX80:99999

Mercury Analysis
Report and Summary QC Forms

ARI Job ID: UX80, UX81

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX81

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
LMW-7-0612	UX81A	12-10471	
LMW-7-0612D	UX81ADUP	12-10471	
LMW-7-0612S	UX81ASPK	12-10471	
LMW-7-0612-D	UX81B	12-10472	
PBW	UX81MB1	12-10472	
LCSW	UX81MB1SPK	12-10472	
LMW-2-0612	UX81C	12-10473	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 12/14/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
Total Mercury by Method SW7470A

Data Release Authorized:
Reported: 06/14/12
Date Received: 06/07/12
Page 1 of 1

QC Report No: UX81-Golder Associates
Project: Landsburg
9231000002.R273

Client/ ARI ID	Date Sampled	Matrix	Prep Date Anal Date	RL	Result
LMW-7-0612 UX81A 12-10471	06/07/12	Water	06/12/12 06/14/12	20.0	20.0 U
LMW-7-0612-D UX81B 12-10472	06/07/12	Water	06/12/12 06/14/12	20.0	20.0 U
LMW-2-0612 UX81C 12-10473	06/07/12	Water	06/12/12 06/14/12	20.0	20.0 U
MB-061212 Method Blank	NA	Water	06/12/12 06/14/12	20.0	20.0 U

Reported in ng/L

RL-Analytical reporting limit
U-Undetected at reported detection limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-0612
MATRIX SPIKE

Lab Sample ID: UX81A
LIMS ID: 12-10471
Matrix: Water
Data Release Authorized:
Reported: 06/14/12

QC Report No: UX81-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Mercury	7470A	20.0 U	103	100	103%	

Reported in ng/L

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LMW-7-0612
DUPLICATE

Lab Sample ID: UX81A
LIMS ID: 12-10471
Matrix: Water
Data Release Authorized:
Reported: 06/14/12

QC Report No: UX81-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: 06/07/12
Date Received: 06/07/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Mercury	7470A	20.0 U	20.0 U	0.0%	+/- 20.0	L

Reported in ng/L

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: LAB CONTROL

Lab Sample ID: UX81LCS
LIMS ID: 12-10472
Matrix: Water
Data Release Authorized:
Reported: 06/14/12

QC Report No: UX81-Golder Associates
Project: Landsburg
9231000002.R273
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Mercury	7470A	202	200	101%	

Reported in ng/L

N-Control limit not met
Control Limits: 80-120%

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX81

UNITS: ng/L

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Mercury	HG	CVL	HG061401	500.0	487.00	**97.4**	500.0	493.00	**98.6**	493.00	**98.6**	494.00	**98.8**	495.00	**99.0**		

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX81

ANALYTICAL RESOURCES INCORPORATED

UNITS: ng/L

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Mercury	HG	CVL	HG061401		20.0	18.40	**92.0**										

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX81

UNITS:ng/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Mercury	HG	CVL	HG061401	25.0	20.0	20.0	U	20.0	U	20.0	U	20.0	U	20.0	U		

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX81 UNITS: ng/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ng/L)	ICP LR DATE
Mercury	HG	CVL	CETAC MERCURY	253.70		25	20.0	4/1/2011		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg

SDG: UX81

ANALYSIS METHOD: CVL

ARI PREP CODE: TLM

PREPDATE: 6/12/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
LMW-7-0612	UX81A	0.000	20.0	20.0
LMW-7-0612D	UX81ADUP	0.000	20.0	20.0
LMW-7-0612S	UX81ASPK	0.000	20.0	20.0
LMW-7-0612-D	UX81B	0.000	20.0	20.0
LMW-2-0612	UX81C	0.000	20.0	20.0
PBW	UX81MB1	0.000	20.0	20.0
LCSW	UX81MB1SPK	0.000	20.0	20.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: CETAC MERCURY | START DATE: 6/14/2012

SDG: UX81 | RUNID: HG061401 | METHOD: CVL | END DATE: 6/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	10325														X																
S20	S20	1.00	10353														X																
S50	S50	1.00	10381														X																
S100	S100	1.00	10405														X																
S200	S200	1.00	10434														X																
S400	S400	1.00	10462														X																
S1000	S1000	1.00	10490														X																
ICV	AICV	1.00	10533														X																
ICB	ICB	1.00	10561														X																
CCV	ACCV1	1.00	10590														X																
CCB	CCB1	1.00	11014														X																
CRA	CRA	1.00	11042														X																
ZZZZZZ	MDLCHECK MB	1.00	11070																														
ZZZZZZ	MDLCHECK 1	1.00	11094																														
ZZZZZZ	MDLCHECK 2	1.00	11123																														
ZZZZZZ	MDLCHECK 3	1.00	11151																														
ZZZZZZ	UX61MB1	1.00	11175																														
ZZZZZZ	UX61MB1SPK	1.00	11203																														
ZZZZZZ	UX61A	1.00	11231																														
ZZZZZZ	UX61ADUP	1.00	11260																														
ZZZZZZ	UX61ASPK	1.00	11284																														
CCV	ACCV2	1.00	11312														X																
CCB	CCB2	1.00	11341														X																
ZZZZZZ	UX61B	1.00	11365																														
ZZZZZZ	UX61C	1.00	11393																														
ZZZZZZ	UX62A	1.00	11421																														
ZZZZZZ	UX62B	1.00	11445																														
ZZZZZZ	UX62C	1.00	11473																														
ZZZZZZ	UX62D	1.00	11501																														
ZZZZZZ	UX62E	1.00	11530																														
ZZZZZZ	UX62F	1.00	11554																														
PBW	UX81MB1	1.00	11582														X																
LCSW	UX81MB1SPK	1.00	12010														X																
CCV	ACCV3	1.00	12035														X																
CCB	CCB3	1.00	12063														X																

FORM XIV

UX81 : 98168

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Golder Associates

PROJECT: Landsburg | INSTRUMENT ID: CETAC MERCURY | START DATE: 6/14/2012

SDG: UX81 | RUNID: HG061401 | METHOD: CVL | END DATE: 6/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
LMW-7-0612	UX81A	1.00	12092														X																
LMW-7-0612D	UX81ADUP	1.00	12120														X																
LMW-7-0612S	UX81ASPK	1.00	12144														X																
LMW-7-0612-D	UX81B	1.00	12172														X																
LMW-2-0612	UX81C	1.00	12200														X																
CCV	ACCV4	1.00	12225														X																
CCB	CCB4	1.00	12253														X																

UX81 : 60169

APPENDIX B
SAMPLE INTEGRITY DATA SHEETS (SIDS)

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-2-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Pump Grundfos

Date 6/7/2012 **Time** 1105

Media Water **Station** LMW-2

Sample Type: **grab** time composite space composite

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

SWL – 7.66 @ 09:56 6/4/12 ft below TOC (monument at elev. X) (bottom at 38.1 ft bgs, 4-in casing)

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

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

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

Sample Description clear, no odor / slight sulfur odor

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

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
1 – 500 ml	Total Metals	HDPE	HNO3 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) Jill Jennelle **Date** 6/8/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-2
Date 6/7/2017
Time Begin Purge 1009
Time Collect Sample 1105

1009 1045
18 18
1027 1103
18
1045 (from pH)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	10:40		6.97	827	10.7	0.05	0.53	112.7
	10:45		7.00	824	10.7	0.04	0.73	93.1
	10:50		7.01	821	10.7	0.04	0.95	89.1
	10:55		7.01	823	10.7	0.02	0.63	82.7
	11:00		7.01	822	10.7	0.02	0.53	77.7

Comments:
Grundfos set @ 80Hz,
5gal / 3min = 1.67gpm → 30 gal/well vol / 1.67gpm = 17.5 min/well vol
PID=0.0ppm

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-3-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Pump Grundfos

Date 6/6/2012 **Time** 1056

Media Water **Station** LMW-3

Sample Type: **grab** time composite space composite

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

SWL – 11.69 @1120 on 6/4/2012 ft below TOC (monument at elev. X) (bottom at 64.8 ft bgs, 4-in casing)

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

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

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

(~27.0 gal/total well vol below packer)

Sample Description clear, sulphur 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 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) Jill Faulkner **Date** 6/8/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-3
Date 6/6/2012
Time Begin Purge 0943
Time Collect Sample 1056

43
27
1000
1027
27
5U

(from pH)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	10:03		7.80	288	10.6	6.16	0.38	192.2
	10:13		7.78	289	10.6	0.08	0.29	169.6
	10:23		7.77	292	10.6	0.06	0.36	155.8
	10:33		7.73	298	10.6	0.05	0.21	149.9
	10:43		7.74	300	10.6	0.04	0.39	147.3
	10:53		7.73	301	10.6	0.04	0.24	144.3

Comments:

Grundfos @ 110Hz
Inflated packer to 110psi

$\frac{5\text{gal}}{5\text{min}} = 1\text{ gpm} \rightarrow \frac{27\text{gal/wellvol}}{1\text{ gpm}} = 27\text{ min/wellvolume}$

PID @ 0.0ppm

Sampler's Initials SL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-4-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Pump Grundfos

Date 6/6/2012 **Time** 1445

Media Water **Station** LMW-4

Sample Type: **grab** time composite space composite

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

SWL – 9.76 @1001 on 6/4/2012 (corrected for angled well) ft below TOC (monument at elev. X) (bottom at 209.7 ft bgs, 4-in casing)

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

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

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

(~26.9 gal/total well vol below packer)

** Depths corrected for 70° inclination

Sample Description sulfur odor, clear.

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 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/8/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-4
Date 6/6/2012
Time Begin Purge 1348
Time Collect Sample 1445

1345
CT
1405
17
1422
17
39 (from pH)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	14:00		6.94	866	10.8	0.21	0.68	155.2
	14:10		6.96	851	10.7	0.05	1.58	110.6
	14:20		6.92	846	10.7	0.04	0.48	100.2
	14:30		6.93	843	10.7	0.04	0.65	91.7
	14:40		6.92	841	10.7	0.04	0.45	82.7

Comments:

Grundfos set @ 118 Hz.
Packer inflated to 140 psi.
Sulfurous odor.

$\frac{5\text{ gal}}{3\text{ min}} = 1.7\text{ gpm}$ $\frac{27\text{ gal}}{1.7\text{ gpm}} = \approx 17\text{ min / well vol below packer}$

PID = 0.0 ppm

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-5-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Pump Grundfos

Date 6/6/2012 **Time** 0930

Media Water **Station** LMW-5

Sample Type: **grab** time composite space composite

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

SWL – 13.11 ft @ 1125 on 6/4/2012 below TOC (monument at elev. X) (bottom at 241.8 ft bgs, 4-in casing)

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

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

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

(~18.7 gal/total well vol below packer)

Sample Description clear, ~~no odor~~ slight sulphur 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 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/6/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-5
Date 6/6/2012
Time Begin Purge 0838
Time Collect Sample 09:30

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	9:10		6.89	735	11.1	12.7	2.39	146.7
	9:15		6.88	731	11.0	0.19	2.60	120.3
	9:20		6.89	730	11.0	0.12	2.59	106.4
	9:25		6.89	729	11.1	0.08	2.38	102.0

Comments:
Grundfos @ 160ft
Packer inflated to 130psi
$\frac{5\,gal}{3\,min} = 1.67\,gpm$ $\frac{19\,gal}{1.67\,gpm} = 11.4\,min/well\,vol$

PID=0.0ppm

Sampler's Initials JS

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-6-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Pump Grundfos

Date 6/6/2012 **Time** 1320

Media Water **Station** LMW-6

Sample Type: **grab** time composite space composite

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

SWL – 24.19' (10:19 6/4/12) ft below TOC (monument at elev. X) (bottom at 105.9 ft bgs, 4-in casing)

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

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

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

(~29.9 gal/total well vol below packer)

Sample Description clear, no odor

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

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
1 – 500 ml	Total Metals	HDPE	HNO3 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/8/2012

Supervisor (signature) [signature] **Date** 6/12/2012

FIELD PARAMETERS SHEET

Well ID LMW-6
Date 6/6/2012
Time Begin Purge 1222
Time Collect Sample 13:20

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C (from pH)	DO mg/L	Turbidity NTU	Eh Rel mV
	12:30		6.89	223	9.9	0.44	7.28	214.1
	12:40		6.88	220	9.6	0.09	3.78	192.8
	12:50		6.87	220	9.7	0.04	1.42	177.3
	13:00		6.85	221	9.7	0.03	3.91	172.9
	13:10		6.89	220	9.7	0.03	0.84	168.2

Comments:
PID = 0.0ppm
Grundfos set @ 170Hz, Inflated packer to 110 psi
Turbid @ start of purge
5 gal / 3 min = 1.67 gpm
30 gal / 1.67 gpm = 18 min / well vol below packer

Sampler's Initials JS

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-7-0512, LMW-7-~~0512~~-D (0612, 0612)

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Pump Grundfos

Date 6/7/2012 **Time** 0935, 940 (dup)

Media Water **Station** LMW-7

Sample Type: **grab** time composite space composite

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

SWL – 210.24 @ 0939 on 6/4/2012 (corrected for 70° inclination) ft below TOC (monument at elev. X) (bottom at 253.7 ft bgs, 4-in casing)

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

Sand Pack Interval – NA

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

Sample Description clear, no odor

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

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
1 – 500 ml	Total Metals	HDPE	HNO3 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/8/2012

Supervisor (signature) [signature] **Date** 6/12/2012

FIELD PARAMETERS SHEET

Well ID MW-7
Date 6/7/2012
Time Begin Purge 0830
Time Collect Sample 0935, 0940 (dup)

0830
20
850
20
910
20
(from pH)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	9:05		7.28	481	12.0	0.23	0.74	198.1
	9:10		7.16	482	12.0	0.11	0.80	177.2
	9:15		7.16	487	12.0	0.08	0.63	162.7
	9:20		7.17	487	12.0	0.08	0.80	156.2
	9:25		7.16	492	12.1	0.06	0.39	148.2
	9:30		7.16	493	12.0	0.06	0.68	146.2

Comments:

Grundfos set @ 34 5Hz

5gal / 3.5min = 1.43 gpm

28 gal / well vol / 1.43 gpm = 19.5 min / well vol.

PID @ 0.0 ppm

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-8-~~0512~~ 0612, LMW-EB-0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Dedicated Tubing and Peristaltic Pump, Bailer for VOC+HCID

Date 6/6/2012 **Time** 1135 EB@1030

Media Water **Station** LMW-8

Sample Type: **grab** time composite space composite

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

SWL -3.59 @ 1129 6/4/2012 ft below TOC (PVC at black notch) (bottom at 13 ft bgs, 2-in casing)

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

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

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

Sample Description clear, noodor, rusty at start of purge

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 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/8/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-8
Date 6/6/2012
Time Begin Purge 1047
Time Collect Sample 1135

(pH meter)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	1055		7.01	574	11.8	0.94	45.1	124.7
	1100		6.92	596	11.6	0.25	34.0	116.8
	1105		6.92	601	11.6	0.27	29.1	115.6
	1110		6.90	611	12.3	0.11	10.5	112.5
	1115		6.90	613	12.4	0.11	9.76	111.2
	1120		6.90	613	12.1	0.10	10.8	109.6
	1125		6.90	612	11.8	0.09	10.6	108.8
	1130		6.91	615	11.7	0.09	10.6	107.5

Comments:

1030 collect field blank prior to purge. Thru tubing (+filter) for diss metals) LMW-EB-0612. used Lab DI

Flow rate: ~180mls/min

Collected VOC + HCl vials using a bailer

PID = 0.0ppm Turbid @ start of purge

Sampler's Initials JSL

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-9-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Pump Grundfos and Dedicated Tubing

Date 6/5/12 **Time** 13:27

Media Water **Station** LMW-9

Sample Type: **grab** time composite space composite

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

SWL – 98.18 ft below TOC (PVC at black notch) (bottom at 159 ft bgs, 2-in casing) 10:57 6/4/12

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

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

Packer Depth – NA (~10.2 gal/casing vol) (~21.6 gal/total well vol) (~65 gal/3 well vol)

Sample Description clear, no odor

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

SEE FIELD PARAMETERS SHEET

Aliquot Amount	Analysis	Container	Preservation / Amount
3 – 40 mL	VOA	VOA Vial	HCl
1 – 500 ml	Total Metals	HDPE	HNO3 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/6/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-9
Date 6/5/12
Time Begin Purge 12:23 PM
Time Collect Sample 13:27 PM

(from pH)

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C	DO mg/L	Turbidity NTU	Eh Rel mV
	12:45		7.04	654	12.1	0.29	0.37	174.4
	12:55		7.09	646	12.1	0.07	0.83	140.2
	13:05		7.08	645	12.0	0.06	0.64	132.6
	13:15		7.09	643	12.1	0.04	0.39	126.6
	13:25		7.09	644	12.1	0.04	0.44	121.6

Comments:
Grundfos set @ 230 Hz
purge rate = 1 gpm
21.6 gal / 1 gpm = 21.6 min / well vol = 64.5 min purge
PID reading = 0.0ppm

Sampler's Initials JS

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-10-~~0512~~ 0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler QED Bladder

Date 6/5/12 **Time** 1455 /

Media Water **Station** LMW-10

Sample Type: **grab** time composite space composite

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

SWL – 0.0 @ 1007 on 6/4/2012 ft below TOC (PVC) (bottom at 289 ft bgs, 4-in casing)

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

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

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

Sample Description clear, 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 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) _____ **Date** 6/6/2012

Supervisor (signature) _____ **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-10
Date 6/5/12
Time Begin Purge 14:17
Time Collect Sample 14:55

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C (from pH)	DO mg/L	Turbidity NTU	Eh Rel mV
	2:28		8.71	343	10.4	0.26	0.44	129.4
	2:33		8.73	342	10.3	0.11	0.53	55.3
	2:38		8.73	342	10.3	0.07	0.28	35.8
	2:43		8.72	342	10.3	0.06	0.29	31.6
	2:48		8.69	342	10.4	0.06	0.26	19.0
	2:53		8.72	341	10.5	0.06	0.28	18.3

Comments: 60 PSI on controller, 110 PSI on tank. cycle ID@ 50 (20 sec/10sec)
flow rate = 700 ml/min
PID @ 0.0 ppm

Sampler's Initials JSI

SAMPLE INTEGRITY DATA SHEET

Plant/Site Landsburg Mine Site **Project No.** 923-1000-002

Site Location Ravensdale, WA **Sample ID** LMW-11-0612

Sampling Location Groundwater Monitoring Well End of dedicated sampling tube

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

Type of Sampler Pump Grundfos and QED Bladder

Date 6/5/12 **Time** 1115

Media Water **Station** LMW-11

Sample Type: **grab** time composite space composite

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

SWL – 155.98 ft below TOC (PVC) (bottom at 707 ft bgs, 4-in casing) 11:07, 6/4/12

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

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

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

Sample Description CLEAR, 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 (non)
1 – 500 ml	Dissolved Metals	HDPE	HNO3 (filter)
4 – 1 Liter, 2 – 40 ml	TPH-HCID	Glass Amber, VOA Vial	HCl

Sampler (signature) [signature] **Date** 6/6/2012

Supervisor (signature) [signature] **Date** 6/11/2012

FIELD PARAMETERS SHEET

Well ID LMW-11
Date 6/5/12
Time Begin Purge 9:11 A
Time Collect Sample 10:15 A

Water Level feet bmp	Time	Volume Purged	pH	Conductivity uS/cm	Temp. °C (from DO)	DO mg/L	Turbidity NTU	Eh Rel mV
	10:12		7.39	466	10.6	4.10	1.81	280.9
	10:27		7.36	494	10.5	0.69	1.81	157.8
	10:42		7.38	492	10.5	2.37	0.73	137.9
	10:57		7.35	492	10.6	0.29	0.92	129.9
	11:12		7.38	489	10.5	0.27	0.35	127.2

Comments:

9:11 began grundfos to initialize flow inside well. Pump set at ~120' below TOC, pump controller @ 330 Hz. purge rate ~2.3 gpm per PM, purged for 1h before starting bladder (instead of 3 well volumes)

10:05 - started bladder pump @ 123 gal purged. pump @ 110 PSI, 1 cpm
rank @ 110 PSI
cycle ID @ 30 (30sec/30sec)
rate = 350 mL/min

PID @ 0.0 ppm

Sampler's Initials JS